

UNIVERSITY OF SOUTHAMPTON

**USING REMEMBER/KNOW STATES OF AWARENESS TO IMPROVE THE
EYEWITNESS CONFIDENCE-ACCURACY RELATIONSHIP**

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Corrections Sheet

Inclusions to the methodology section of all experiments the schools participants attended, nature of recruitment, issue of drop-out of participants, reason for the reduction in the numbers of participants tested and analysed. An analysis of overall response in terms of number of questions answered, number of correct and incorrect responses for all participants tested was conducted. A description of the video and audio events was placed in the Appendix. Mention was made of the overlapping features in the central/peripheral detail definitions and a list of the central and peripheral detail questions included in the Appendix. It was noted that the responses to questions were scored in a 'blind' fashion to prevent bias in the analysis. The standard deviations in proportion accuracy were checked for accuracy.

The data that went into the regression analyses were clarified in all the experiments. The 'remember'/'know' coefficients were added to show that both retrieval states contributed to event accuracy and confidence respectively. ANOVA analyses were conducted to examine differences in confidence when participants gave accurate and inaccurate answers. The appearance of 'floor' effects in the data was discussed and there was clarification of the computation of the CA gamma correlation. The use of a Wilcoxon-signed ranks test to evaluate the effects of retrieval state and detail on the CA association was discussed.

Clarification was given with reference to the Feeling of Knowing studies on two accounts. First, a reminder that the FOK data were collected with the recall data. Second, the limitations of a test-re-test design, inherent in the FOK paradigm, were discussed. Clarification was given in all the experiments of the numbers of participants and the data that went into each type of data analysis performed. Mention was made of the low numbers of participants in some of the experimental conditions which precluded a rigorous test of the experimental hypothesis. Data analysis of the 'Don't know' responses in Table 10.5.1 was conducted. It was noted that the 'remember seeing' instruction in Part Two of the thesis perhaps made participants conservative in responding to questions. The number of questions answered for each retrieval instruction was calculated to ascertain if this effect occurred. Differences in the research design and methodology in Parts One and Two of the thesis were acknowledged and tentative comparisons of the two sets of results made.

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ABSTRACT

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USING REMEMBER/KNOW STATES OF AWARENESS TO IMPROVE THE
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This thesis represents the first empirical evidence of the contribution of a witness's state of awareness at retrieval, to the reliability of the confidence-accuracy (CA) association. The remember/know procedure was used to evaluate the effectiveness of a 'remember' retrieval *state* (Part One) and a 'remember' retrieval *instruction* (Part Two) to accuracy, confidence and the CA association. The influence of detail type (central, peripheral) to performance was a secondary issue, and a source monitoring task was included. The effects of states of awareness and detail were evaluated across eyewitness age (adult, child) and test (recall, recognition). The accuracy of feeling of knowing (FOK) judgements was also investigated.

ANOVA analyses in Part One confirmed the benefit of a 'remember' state of awareness accompanying retrieval to recall accuracy, across age. This advantage did not extend to recognition accuracy. Adults were more confident when they remembered an event, and CA resolution was good for central details they remembered. Children's CA resolution during recall was unaffected by their retrieval state or the detail reported. Remembering led to a strong CA correlation for peripheral details adults recognised, and central details children recognised. FOK predictive accuracy was above chance performance, in all age groups, and accompanied by a 'know' retrieval state.

ANOVA analyses in Part Two confirmed the benefits of a 'remember' *pre-test* instruction to recall accuracy across age, and adult recognition accuracy. The CA correlation responded to the centrality of the detail reported, rather than the 'remember' instruction, in all the experiments. Predictive FOK accuracy was above chance, and high for peripheral details children could not spontaneously recall. The data are discussed in relation to the Source Monitoring Framework and the utility of using a remember-based instruction to increase the quality of eyewitness reports and the reliability of their CA judgements.

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CHAPTER ONE: INTRODUCTION

“A confident witness is not more likely to be accurate than a hesitant witness. ... Confidence does not reflect relative accuracy (Smith, Kassin & Ellsworth, 1989, p.356).”

1.1 Aims and contribution of the thesis

In everyday situations people attempt to convince themselves and others of the reliability of their memories through their expressions of confidence, ‘I am sure that it is true!’ In a forensic context such assertions of the reliability of one’s memory is of paramount importance (Shaw, Garcia & McClure, 1999). An accurate witness provides vital information that clarifies an incident, initiates the search for a suspect, and sways a jury to convict or acquit a defendant. Given this premium on accuracy in the courtroom, it is worrying that witnesses are not always accurate in their recollections of an event (see Wright & Davies, 1999 for recent reviews). Moreover, confident witnesses are not necessarily more accurate than those persons who are less certain about their knowledge (Shaw, 1996; Thompson & Mason, 1996). The extent to which confidence is a reliable indicator of accuracy is described in the psychological literature as the confidence-accuracy (CA) relationship. The element of surprise in becoming a witness often leads to poor memory for an event. Memories arise from an observer’s reflections and reconstructions of the details of an incident, and these reconstructive memory processes weaken the ability to match confidence and accuracy (Leippe, 1980). There is currently an interest in the phenomenological experiences of memories, for example, the state of awareness accompanying one’s memory, and the thoughts and feelings associated with that knowledge. These phenomenological experiences have been used to assess the veracity of eyewitness accounts. This suggests that mental retrieval states are an important factor to consider in explaining the strengths and weaknesses of eyewitness performance.

The aim of this thesis is to examine if a witness’s state of awareness at the time a report is given is related to response accuracy, confidence and the reliability of the CA association. Two retrieval states have been identified; ‘remembering’ and ‘knowing’ (Tulving, 1985). The ability to ‘remember’ information improves accuracy and confidence more than ‘knowing’, because the rememberer can mentally ‘re-live’ the experience, contextualize events and describe both the target information and associated details

(Tulving, 1985). Locating the source of information improves memory because it assists in verifying the authenticity of reports. Source monitoring is facilitated by the 'remember' retrieval state (Johnson, Hastroudi & Lindsay, 1993). 'Knowing' is characterised by familiarity with an event, but in the absence of conscious recollection, there is a lack of knowledge of specific details. There is a substantial body of evidence that a 'remember' mental state is associated with greater accuracy and confidence when reporting words (Toplis, 1997; Tulving, 1985) and autobiographical memories (Conway, Collins, Gathercole & Anderson, 1996; Hyman, Gilstrap, Decker & Wilkinson, 1998).

The contribution of this thesis is the application of the remember/know model to the study of eyewitness memory, particularly, the CA relationship. A CA judgement is a meta-memory judgement because it requires insights into one's knowledge; specifically, the availability and accessibility of some target information. A state of awareness that is based on context reinstatement or associated with source monitoring is expected to facilitate CA processing. Requesting witnesses to reflect upon their experiences, to identify how knowledge was obtained, and to locate the source of their information encourages efficient memory monitoring. Consequently, it is expected that Tulving's 'remember' state of awareness at retrieval is more likely to increase accuracy, confidence and reliable CA judgements, than a 'know' retrieval state.

The experiments reported in the thesis responded to the call for more research to clarify the role of consciousness in mental life on a variety of memory tasks (Dalla Barba, 2000). Four experiments (Part One) assessed the role of the state of awareness accompanying eyewitness reports to response accuracy, confidence and the CA association across age (adult, child) and test (recall, recognition). The studies were sensitive to the type of detail reported (central, peripheral) and a source monitoring task was incorporated in the design. The relationship between retrieval state and source accuracy, as well as the link between source accuracy and event accuracy were evaluated. Memory for the details of a video-taped crime event was measured after a delay of 24 hours. Investigating the reliability of children's CA performance fills a gap in the memory literature. Children's participation in the legal system as defendants, victims and witnesses makes a developmental study of the strength of the CA association a high priority. The influence of detail type to non-recollective, feeling of knowing (FOK) judgements, as well as the role of retrieval state in

FOK predictive accuracy were investigated with adults and children. The FOK experiments responded to the request for research to assess the extent to which insights into memory is predictive of subsequent performance (Weaver & Keleman, 1999), in particular, eyewitness prospective memory (Perfect & Hollins, 1999).

The results obtained in Part One of the thesis were applied in Part Two by manipulating witnesses' state of awareness prior to information retrieval, through the administration of pre-test instructions. The emphasis on recollection (Johnson et al., 1993; Tulving, 1985) is encouraged by focussed retrieval (Norman & Schacter, 1996). The reliability of eyewitness reports was expected to improve by asking witnesses to report only what they can 'remember seeing' of a previously presented event. State of awareness instructions (remember seeing, non-directive) were administered to witnesses prior to questioning. The effectiveness of a 'remember seeing' instruction to response accuracy, confidence and the CA association was evaluated across eyewitness age (adult, child) and test (recall, recognition). Four experiments assessed memory for the central, critical details of the video event as well as the background, peripheral information. The influence of detail type and state of awareness to FOK judgements and FOK accuracy were evaluated with adults and children.

1.2 The Confidence-Accuracy Relationship

The confidence-accuracy relationship is weaker for eyewitness reports than responses to general knowledge questions (Bornstein & Zickafoose, 1999; Perfect, Watson & Wagstaff, 1993). Several reasons account for this finding. Eyewitness accounts can contain as many interpretations of an event as there are witnesses to that incident. The difficulty in verifying details of a crime, because of a lack of feedback inherent in witness observations, reduces the ability to be confident and accurate (Wells, Lindsay & Ferguson, 1979). The importance of feedback in assisting participants to reliably match confidence and accuracy is questionable because feedback failed to strengthen the CA association on a general knowledge test (Thompson, 1998). In contrast to eyewitness memory, the consensus of answers underlying general knowledge questions, for example, 'What is the capital of Italy?', facilitates memory monitoring and produces strong CA correlations.

The strength of the CA correlation reported in eyewitness experiments varies across

studies, and it is sensitive to whether a within-subjects or a between-subjects measure is utilised in the design. Between-subjects designs are inter-individual and they compare the performance of confident witnesses with those who are less confident, but such designs generate low CA correlations. These designs are criticised for not considering how an individual's performance may vary within a task (Gruneberg & Sykes, 1993; Smith, Kassin & Ellsworth, 1989). Within-subjects measures are intra-individual because such measures evaluate the degree to which confident statements are more accurate than less confident statements given by the same witness. Within-subjects designs produce higher CA correlations than between-subjects designs (e.g. Perfect et al., 1993).

The controlled, artificial nature of psychological experiments reduces the forensic realism and the variation in the data needed to produce statistically significant CA correlations (Gruneberg & Sykes, 1993). Ceiling or floor effects in the data minimise the variation necessary for reliable CA associations (Olsson & Juslin, in press). Heterogeneous test items are associated with high CA correlations because individuals may find some questions easier to answer than others, and they would be more likely to be confident when accurate. Kebbell, Wagstaff and Covey (1996) examined how the eyewitness CA relationship related to item difficulty. Undergraduates were asked questions pertaining to 'easy' and 'hard' items presented to them in a video-taped event. Kebbell et al. reported a mean within-subject correlation of $r = .50$ for the 'easy' test items and $r = .17$ for the 'hard' test items. These data suggest that varying the type of information presented to witnesses would increase the variation necessary to produce significant CA correlations. Consequently, eyewitness memory in this thesis was examined using a central/peripheral detail differential.

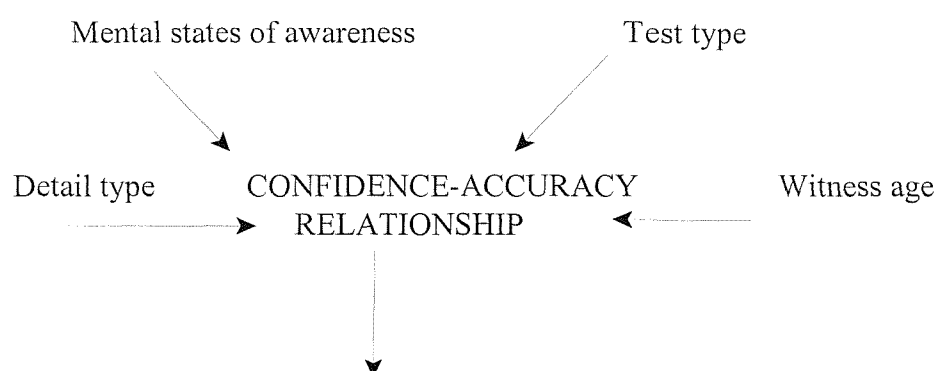
Performance studies demonstrate that the strength and direction of the CA association for eyewitness memory is less reliable than for general knowledge. Despite this, confidence continues to be used an index of accuracy by jurors to establish the credibility of witnesses (Brewer, Potter, Fisher, Bond & Luszez, 1999; Cutler, Penrod & Dexter, 1990; De Paulo, Charlton, Cooper, Lindsay & Muhlenbruck, 1997; Penrod & Cutler, 1995; Shaw, Garcia & McClure, 1999). The importance of a confident demeanour when testifying appears to be encouraged by the law (Riding, 1999) and it is used by police officers to evaluate witnesses and their testimony (Kebbell & Milne, 1998). Witnesses regardless of

the degree of certainty of their memories, easily conform to the accounts of more confident witnesses (Wright, Self & Justice, 2000, Experiment 2). Given the reliance on witnesses' confidence when testifying, it is important to identify the conditions that assist them to be aware of their knowledge and the process by which their memories are derived. Witnesses who have a better insight into their knowledge should express more confidence when they are accurate. This belief is based on the optimism of meta memory theorists, such as Koriatic (1998), who believe that people are accurate in monitoring the availability and certainty of their knowledge. Asking individuals to estimate their accuracy by giving a confidence judgement, encourages them to control the information they choose to report or withhold (Koriat & Goldsmith, 1996). Although it is expected that accurate witnesses would express more confidence in their memories than inaccurate ones, the accuracy of memory depends upon the accuracy of meta-memory; that is, insights into one's memory.

1.3 Measuring the Confidence-Accuracy Association

A review of the eyewitness literature reveals several ways in which the CA association is measured. Some identification studies measure the CA association using a point-biserial correlation coefficient, for example, Pearson's r (e.g. Kebbell et al., 1996; Read, 1995; Robinson & Johnson, 1996) while others employ a *calibration* technique (Granag, 1997). Calibration establishes the relationship between accuracy and confidence over different confidence categories and the calibration score ranges from 0, (perfect calibration), to 1.00, (poor calibration). Another option is to calculate *resolution*. Resolution reflects the ability of participants to distinguish between correct and incorrect answers. Good resolution is achieved when correct responses are assigned a higher confidence value than incorrect responses. One way of calculating resolution is to correlate each participant's confidence with his or her accuracy score by computing a Goodman-Kruskal's gamma correlation. This analysis is consistent with a within-subjects design and it is commonly used to evaluate eyewitness memory for events (Hollins & Perfect, 1997; Perfect et al., 1993; Perfect & Hollins, 1996). The confidence-accuracy relationship for all the experiments reported in the thesis was measured using the Goodman-Kruskal's gamma correlation. The structure of the thesis and the anatomy of the experiments are illustrated in Figure 1.3.1.

Figure 1.3.1 Variables influencing the Confidence-Accuracy Relationship: Anatomy of Experiments



PART ONE

Effects of remember/know judgements and detail after 24 hrs for:-

Exp.1a - Adult recall

Exp.1b - Adult feeling of knowing judgements

Exp.1c - Adult recognition

Exp.2a - Children's recall

Exp.2b - Children's feeling of knowing judgements

Exp.2c - Children's recognition

PART TWO

Effects of remember/know instructions and detail in facilitating immediate:-

Exp.3a - Adult recall

Exp.3b - Adult feeling of knowing judgements

Exp.3c - Adult recognition

Exp.4a - Children's recall

Exp.4b - Children's feeling of knowing judgements

Exp.4c - Children's recognition

1.4. THEORETICAL REVIEW

Despite a growing body of literature, no single theory emerges to explain the nature of the eyewitness CA relationship or to predict the strength and direction of its association. This lack of eyewitness theories led to a search for alternative explanations from memory and

meta-memory theories to explain why errors occur and how memory can be improved. One predominant finding is that the mental state of awareness accompanying retrieval is responsible for the accuracy of memories. The importance of these states of awareness is highlighted in the remember/know paradigm (Tulving, 1983; 1985). The distinction between 'remembering' and 'knowing' draws theoretical support from the Source Monitoring Framework (SMF) presented by Johnson and colleagues (e.g. Johnson et al., 1993; Johnson & Raye, 1981). This reviews outlines why retrieval state and detail type influence response accuracy as well as confidence, and may determine CA resolution. The memory and meta-memory differences between adults and children are summarised and the role of retrieval state in facilitating children's performance is considered.

1.5. The Remember/Know Paradigm

In its general usage the term 'remember' is used as a synonym for 'memory'. However, a remember/know distinction is made to identify two independent means of accessing the past (Tulving, 1983;1985). Remember/know decisions are meta-memory judgements with distinctive phenomenological qualities. Remembering is based on autonoetic or self-knowing consciousness.

'Remembering is a conscious experience. To remember an event means to be consciously aware now of something that happened on an earlier occasion.'

(Tulving, 1985, p. 1)

The mental replay of an event encourages a travelling back in time and this mental reinstatement of context improves memory for general events and specific details. The ability to be consciously aware of past events, and of the experiences associated at the time information was acquired, distinguishes 'remembering' from 'knowing'. The importance of being able to remember information is outlined in Tulving's (1983) General Abstract Processing System (GAPS) which draws support from the Source Monitoring Framework (Johnson & Raye, 1981).

GAPS discusses the importance of 'feature overlap'; that is, the overlapping of features or elements present during the encoding of material and the subsequent retrieval of that information. The accuracy of reports increases with the increase in feature-overlap. Tulving also referred to the 'encoding specificity' hypothesis in the GAPS framework. This

hypothesis states that retrieval is dependent upon the characteristics of the original event, the cognitive environment in which information was acquired, and the characteristics of the retrieval cue, comprising words, phrases or questions. Weak traces are accessible with a 'rich' retrieval cue or mental state. The ideas outlined in the 'feature overlap' concept and the 'encoding specificity' hypothesis accord with Deffenbacher's (1980) 'optimality hypothesis'. The 'optimality hypothesis' links the strength of the CA association to the information processing conditions present during the encoding, storage and retrieval of information. According to Deffenbacher, optimal conditions increase the reliability of CA judgements. This implies that an interviewer could maximise response accuracy and assist CA judgements by directing witnesses to be aware of how information was retrieved.

Tulving describes a second state of awareness, 'knowing', which is based on noetic consciousness. It is characterised by a sense of familiarity of past events without conscious recollection of the event or specific details of the incident. For example, an eyewitness may know that a red car was involved in a 'hit-and-run' incident, but the witness may be unable to describe the features of the vehicle or to identify the car from among similar models. Familiarity without recollection would reduce the ability to provide a detailed description of an event because of the inability to locate such information within a particular context and time. Memory based on a sense of familiarity can easily be confused with schematic or similarly stored knowledge and would be less accurate than remember-based recollections (Gardiner, Kamiska, Dixon & Java, 1996).

Tulving (1985) established the remember/know procedure for investigating how retrieval state affects performance. The procedure is based on the assumption that people are aware of how their memories are obtained, and it relies on the self-reports of participants in an experiment. Participants are provided with descriptions of 'remember' and 'know' mental states and subsequently asked to identify which state of awareness accompanied their retrieval of some previously presented material. Tulving (1985, Experiment 1) measured recall accuracy for words immediately after they were presented to undergraduates. Using a within-subjects design, participants made remember-know judgements for items recalled under free recall, cued-recall, and recognition conditions. The research revealed that 'remember' judgements accompany more accurate and confident responses than 'know' judgements. Additionally, 'remember' judgements occurred most

frequently for free recall, followed by cued-recall, with recognition memory evoking fewer 'remember' responses. This suggests that in the absence of contextual information, as in free recall, a 'remember' state of awareness is most beneficial to recall. In contrast, recognition involves discriminating previously presented information from 'new' material, and this is largely a familiarity judgement. The alternative answers on a recognition test provide 'cues' for retrieval, thus improvements in recognition accuracy may depend less on the ability to 'remember' events and more on the familiarity with general events (Fell, 1992).

In addition to the use of participants' self-reports (e.g. Toplis, 1997; Tulving, 1985), electrophysiological evidence reveals that 'remember' and 'know' mental states patterned the brain activity for auto-noetic and noetic consciousness respectively (Düzel, Yonelinas, Magun, Heinze & Tulving, 1997). There is a substantial body of evidence that 'remembering' is associated with greater accuracy and confidence than 'knowing' during word recall (Düzel et al., 1997; Toplis, 1997, Experiment 1) and recognition (Dewhurst & Conway, 1994; Gardiner, 1998; Gardiner & Java, 1991; Gardiner & Parkin, 1990; Tulving, 1985, Experiment 1). Rajaram and Roediger (1997) noted that if 'remember' responses reflect higher confidence estimations than 'know' responses, then remember/know judgements do not represent states of consciousness that differ from those mental states underlying confidence judgements. The reliability of remember-based recollections extend to musical stimuli (Gardiner et al., 1996) and autobiographical memories. The ability to revive and to be consciously aware of a personal experience, increase the accuracy of autobiographical reports. Autobiographical memories acquired during a 'remember' retrieval state are more accurate than similar memories 'known', because they can be contextually and temporally placed (Conway, Collins, Gathercole & Anderson, 1996; Hyman et al., 1998). Less is known about the effectiveness of 'remembering' versus 'knowing' details in facilitating eyewitness memory, although the benefits obtained with autobiographical memory is expected to facilitate eyewitness performance.

Another line of evidence that supports the effectiveness of 'remembering' to eyewitness performance is present in research on the Cognitive Interview (CI). The CI (Geiselman, Fisher, Firstenberg, Hutton, Sullivan, Avetissian & Prosk, 1984) and the enhanced Cognitive Interview (Fisher & Geiselman, 1992) were developed for questioning

witnesses. The three main features of the enhanced CI to (1) reinstate the environmental and emotional context; (2) recall from different personal perspectives; and (3) recall in different temporal orders, were based on Tulving's concepts of 'encoding specificity', 'feature overlap' and 'autonoetic consciousness'. The CI facilitates accuracy because the more contextual information that a witness can retrieve, the more likely it is that the memory is accurate (Higham & Roberts, 1996; see Memon, Vrij & Bull, 1998 for a review). Research demonstrates that the 'remember' state of awareness encouraged in the CI increases the number of correct eyewitness statements (Miller, Fremouw, Aljazireh & Parker, 1996), and it increases accuracy by more than 35 percent than a Standard Interview (SI), in which context reinstatement is not encouraged, (Kohnken, Schimossek, Aschermann & Hofer, 1995). Children are also more accurate when interviewed with the CI than the SI (McCauley & Fisher, 1995; Memon, Holley, Wark, Bull & Kohnken, 1996). Evidence that the CI facilitates accuracy suggests that a 'remember' retrieval state (Part One) and a 'remember seeing' retrieval instruction (Part Two) would improve the quality and reliability of eyewitness reports.

There is a second practical application of the use of retrieval states in assessing eyewitness testimony. The police and psychologists currently use a Criterion-Based Content Analysis (CBCA) for distinguishing between false and true testimony (see Vrij & Akehurst, 1998 for a review). The CBCA is premised on the view that memories of actual experiences differ in phenomenological qualities from fantasies and illusions. The quality of reported details, such as specific descriptions of time and places of events, and the accounts of subjective mental states, thoughts and feelings associated with the memory, are key elements of the CBCA. Given the importance of the state of awareness accompanying eyewitness reports, the use of the remember/know procedure for examining response accuracy, confidence and the confidence-accuracy relationship has theoretical and forensic relevance.

The remember/know paradigm is not without criticism. Tulving's definitions of 'cue' and 'feature-overlap', outlined in his (1983) GAPS framework, were criticised for being unfalsifiable (Gwyer, 1997). Gwyer argued that if a 'cue' was successful in retrieving accurate memories, this proves that the word or phrase was a 'cue'. Conversely, inaccurate reports indicate that memory was not sufficiently 'cued'. Similarly, 'feature overlap' can

be proven only with accurate retrieval. In a naturalistic study that tested the utility of 'feature-overlapping', it was expected that maximizing the number of appropriate contextual cues at encoding during retrieval would increase the amount of reliable details when sexually abused children were re-interviewed at the scene of a crime (Orbach, Hershkowitz, Lamb, Sternberg & Horowitz, 2000). Abused children aged 4-13 years ($M = 9$ years) participated in the study. Orbach et al. failed to obtain evidence that the number of physical, contextual cues present in the environment assists victim reports more than a control group who were re-interviewed in an office.

A debate exists between theorists who consider 'remembering' and 'knowing' to be independent processes (Duzel et al., 1997; Gardiner & Parkin, 1990; Tulving, 1985) and those who believe that a 'knowing' state is implicitly achieved when someone remembers an experience (Gardiner, Gawlik & Richardson-Klavehn, 1994; Jacoby, Yonelinas & Jennings, 1997; Knowlton, 1998; Mantyla, 1993). Those who reject the notion that remember/know states are independent and mutually exclusive claim that 'knowing' processes are activated during remembering (Knowlton, 1998) or that the relation between recollection and familiarity is redundant (Yonelinas & Jacoby, 1995). Yonelinas and Jacoby used the example of a source monitoring, recognition task to explain their 'redundancy' argument. They argued that recognition memory for an event is based on familiarity, while source identification represents a measure of recollection. Consequently, information that is recollected is a subset of the material that is recognised. Hence recollection is always accompanied by familiarity.

An alternative to the redundancy argument is the belief that 'remembering' and 'knowing' cannot be dissociated or separated (Gardiner et al. 1994; Jacoby et al., 1997; Mantyla, 1993). In the mutually exclusive model described by Tulving (1985) the proportion of 'know' responses decreases in relation to an increase in the proportion of 'remember' responses. The dissociation view states that 'remembering' and 'knowing' co-occur, but the two processes act independently; that is, some variables may influence one state of awareness but not the other. Deeper levels of processing (Gardiner, 1988) and divided attention during study (Gardiner & Parkin, 1990) increase the probability of a 'remember' response, but do not influence the probability of a 'know' response. The development and use of schemas in the recognition of musical stimuli increase the number

of 'know' judgments compared to 'remember' judgements (Gardiner et al., 1996).

Maintenance rehearsal affects knowing but not remembering (Gardiner et al., 1994) while elaborate rehearsal influenced remembering but not knowing (Mantyla, 1993).

Some theorists view retrieval states as residing along a remember/know continuum. These theorists (Donaldson, 1996; Hirshman & Master, 1997) propose a Signal Detection Theory (SDT). Donaldson's model views the classification of remember/know judgements in the following way. When a question is asked two responses are possible, 'yes' the information is available or 'no' the information is unavailable. 'Yes' responses are further sub-divided along a second criterion; information 'remembered' or 'known'. The identification of a 'remember' state of awareness accompanying retrieval represents a higher criterion of accuracy than a 'know' or 'familiarity' judgement. According to Donaldson a 'remember' decision is a conservative 'yes' response. The weakness of SDT is that it does not provide an explanation of the subjective states of awareness underlying 'remember' and 'know' responses or the reasons why different independent or subject variables produce varying results (Gardiner, Richardson-Klavehn & Ramponi, 1998).

In addition to the theoretical limitations of the remember/know paradigm previously outlined, there are methodological concerns. The degree to which a 'remember' retrieval state can facilitate eyewitness memory in the same way as it improves memory for words (e.g. Gardiner & Java, 1990; Duzel et al., 1997) needs to be examined empirically. More complex meta-memory decisions are required by participants in an eyewitness experiment than those participating in a word-list study. The consequences of inaccurate reports and overconfidence are more severe for eyewitnesses. Witnesses are required to provide complete and accurate reports which may involve discriminating between sources of information, or locating specific details within a sequence of events. Descriptions of persons and events are required and witnesses must weigh the risks of making errors of omission, omitting incidents that happened from their reports, or errors of commission, mistakenly reporting inaccurate events. Errors of omission and commission weaken the CA association.

The act of remembering can be detrimental, rather than instrumental, to eyewitness performance (Robinson & Johnson, 1998). Remembering can distort memories in two ways; people remember events differently from the way they happened; alternatively,

individuals may make a source monitoring error and they 'remember seeing' events they actually imagined (Jacoby, Kelley & Dywan, 1989; Roediger & McDermott, 1995). A delay in reporting information (Payne, Elie, Blackwell & Neuschatz, 1996) or repeatedly describing an event (Goff & Roediger, 1998) increases the risk of mis-remembering material. There is ample evidence that people can be easily mis-lead into remembering suggested events (e.g. Zaragoza & Lane, 1994).

If the process of re-experiencing an event inflates confidence for imagined events, remembering does not make memory better, it makes memory seem better (Dobson & Johnson, 1996). The problem of overconfidence is described as a "confidence main-effect problem" (Luus & Wells, 1994, p. 715). This effect occurs when a variable causes a dramatic shift in confidence without a relative change in accuracy. The 'overconfidence phenomenon' exists when the mean confidence exceeds the proportion of correct answers, a situation that produces weak CA correlations. Mather, Shafir and Johnson (2000) reported that participants were overconfident in their performance when responding to general knowledge questions, perhaps due to the consensus of knowledge underlying general knowledge information. Equally, the problem of under-confidence should lead to unreliable CA associations, but the cognitive basis for under-confidence has received less attention. A recent meta-analysis of studies examined general knowledge information, on a 'hard-easy' dimension, with a two-alternative forced-choice item test. The reviewers concluded that the overconfidence effect may be a statistical artifact, due to floor or ceiling performance, rather than a cognitive processing bias (Juslin, Winman, & Olsson, 2000).

The ability to match confidence and accuracy appears to be impeded by introspection. In contrast to the benefits of the 'remember' state of awareness identified by Tulving (1983; 1985), Robinson and Johnson (1998) caution that introspective memory techniques such as mental context reinstatement, or monitoring one's state of knowledge in order to make a 'remember/know' distinction, can inflate eyewitness confidence without regard for the accuracy of the recollected information. They assessed the CA relationship using a suspect identification task and reported that CA decisions were more reliable when witnesses made familiarity-based judgements based on the 'pop-out-effect' of faces from the line-up of suspects.

A methodological limitation of the remember/know procedure relates to the reliance

on participants' subjective, self-reports to evaluate the relationship between retrieval state and performance. The remember/know dichotomy may encourage participants to believe that information not 'remembered' was 'known', and vice versa. Furthermore, if participants are unable to differentiate between 'remembering' and 'knowing', this jeopardises the reliability of experimental data. This can occur in several ways. Remember/know retrieval states arise voluntarily, through a deliberate search for information, or involuntarily (Gardiner, Richardson-Klavehn & Ramponi, 1997). The familiarity of an event associated with knowing makes information more accessible and this ease of retrieval could be mistaken for remembering (Kelley & Lindsay, 1993).

Recognition judgements based on a feeling of familiarity cannot be equated with 'know' responses because a sense of familiarity cannot be guaranteed by instructing subjects (Kinoshita, 1999). The subjective awareness of what influences information retrieval is merely a memory attribution or an inference that follows an implicit memory strategy (Jacoby, Kelley & Dywan, 1989). It is suggested that the procedure of placing recollection and familiarity in opposition to each other can lead to the underestimating of familiarity-responses because of the offsetting effect of recollection (Kelley & Jacoby, 1998). Despite these concerns about participants' ability to reliably distinguish 'remembering' from 'knowing,' it is argued that 'recollection' is a private experience and one must rely on participants' reports to identify the retrieval state accompanying their memory (Rajaram & Roediger, 1997). Rajaram and Roediger emphasised the importance of ensuring that participants understand the judgements to be made, the task and the instructions. They believe that with careful use, the remember/know procedure produces a fairly consistent body of evidence.

The difficulty in differentiating between the 'remember'/'know' states of awareness makes it imperative to conduct manipulation checks to evaluate exactly what participants experience during the remember/know retrieval states. Manipulation checks are useful to assess first, if 'remembering' is actually accompanied by mental context reinstatement and 'knowing' is not; and second, to determine if remember/know states were used exclusively by participants, or if they relied on another retrieval strategy, such as 'guessing'. With the exception of two-word recognition studies (Gardiner, Ramponi & Richardson-Klavehn, 1998a; Java, Gregg & Gardiner, 1997), such checks are not generally included. Gardiner et

al. reported that imagery and associations accompanied 'remember' judgements while 'know' responses were associated with a feeling of knowing and a sense of familiarity. Java et al. reported that participants found it easier to describe their 'remember' experiences than their 'know' ones.

Experiments modelled after the remember/know procedure may include other response options such as a 'guess' response rather than an unanswered question (e.g. Toplis, 1997). Toplis's study examined word recall but a 'guess' option was not included in this thesis because is not forensically appropriate for an eyewitness experiment. Furthermore, guesses may be confused with 'knowing'; however, 'guessing' reflects an absence of memory, while 'knowing' implies memory (Dienes & Perner, 1999; Gardiner & Richardson-Klavehn, 1999). Although Tulving's model described 'remember' and 'know' states of awareness, there are other mental states (e.g. a 'feeling of knowing'), that represent partial memory but influence confidence (Jacoby et al., 1997).

Over the last decade there has been a growing interest in the relationship between the phenomenal qualities of remembering, measured as 'remember'/'know' judgements or confidence ratings, and overall accuracy (see Koriat, Goldsmith & Pansky, 2000 for a review). Despite the limitations of the remember/know model previously identified, research reveals that memory is more reliable when reported during a 'remember' state of awareness at retrieval, than a 'know' one. Tulving's remember/know procedure draws support from the Source Monitoring Framework. The procedure relies on participants' self-reports and it highlights the active role of the rememberer in monitoring information retrieval. People can regulate information by screening out material that is likely to be incorrect, and so improve accuracy. When individuals cannot readily improve the quality and accuracy of the material retrieved, they can improve on the quality of what is reported (Koriat & Goldsmith, 1996). The CI demonstrates how an instruction to mentally reinstate a previous experience increases the criterion of accuracy for remember-based recollections, by filtering out knowledge that cannot be verified by contextual details. This justified the examination in Part Two of the thesis of the role of a 'remember seeing' instruction in improving eyewitness accuracy and the confidence-accuracy relationship. The next section outlines the Source Monitoring Framework which emphasises the importance of source accuracy to the accurate reporting of an event.

1.6. Reality Monitoring (RM) and The Source Monitoring Framework (SMF)

Johnson and Raye (1981) noted that the inability to engage in reality monitoring, distinguishing thoughts of an incident from actual events, can be accompanied by confidence in memory illusions. This would jeopardise the reliability of eyewitness memory. Using a realistic example Crombag, Wagenaar and Van Koppen (1996) demonstrated how inferences about dramatic events constituted post-event information which were easily mistaken for first-hand knowledge of the event. The study by Crombag et al. was based upon a real-life event, the crash of a cargo El Al Boeing 747 into an 11-storey apartment in the Netherlands in October 1992. Many participants in their study 'remembered seeing' events that never occurred, a reality-monitoring error.

The Source Monitoring Framework (SMF) was developed by Johnson and colleagues (Dodson & Johnson, 1996; Johnson et al., 1993; Johnson, Nolde & De Leonardis, 1996; Johnson & Raye, 1981) and it emphasises the importance of source monitoring efficiency to the accuracy of event recall. Source monitoring is the process by which individuals attribute the source of their memories to the social context in which the information was acquired or the medium through which the information was received. Memories consist of different types of information (e.g. semantic, temporal, contextual and perceptual) and event memory is more likely to be correct when memories can be verified by locating the source of one's knowledge. How, when and where information was obtained provide an important cue in avoiding memory errors. When fragments of an episode are retrieved, but memory for the source of the event is absent, the reliability of that information is questionable (Johnson et al., 1993). Johnson (1997) describes a two-step process in source monitoring. First, there is a rapid decision based on the phenomenological experience of the memory along the dimension of familiarity or recollection. Then there is a source-monitoring phase based on a slower reasoning process in which supporting or disconfirming evidence is used to locate the source of the memory.

In the first phase of source-monitoring, familiarity is distinguished from recollection by the vagueness or specificity of the memory. The SMF highlights the role of consciousness or mental states in source monitoring and the optimal conditions for source monitoring are present in Tulving's 'remember' retrieval state of awareness. Johnson et al. (1993) suggests that a 'know' response occurs when a person has virtually no information

about the source. In contrast, 'remembering' facilitates source accuracy (Henkel, Franklin & Johnson, 2000) by reducing suggestibility to (mis) information (Multhaup, DeLeonardis & Johnson, 1999). Recollection facilitates source monitoring which in turn increases response accuracy and confidence (Johnson, 1997; Mather, Henkel & Johnson, 1997; Rajaram & Roediger, 1997).

Mental experiences also vary along a qualitative dimension for example, visual detail, spatial information and emotion (Johnson et al., 1993). Source and reality monitoring rely on the qualitative aspects of memory, including insights into one's thoughts and information pertaining to the cognitive operations involved in experiencing an event (Henkel et al., 2000). The link between states of awareness and source accuracy is illustrated in the phenomenal quality of source-accurate and source-inaccurate information. Perceived and experienced events, as well as events 'remembered' and 'known', differ in their visual clarity and contextual details. Real experiences are richer in sensory as well as contextual details, than imagined events (Johnson, 1997). Source accuracy is associated with a greater degree of visual details and more information about thoughts and feelings, than source errors (Henkel et al., 2000). 'Remembered' autobiographical memories contain more details which are described as being more vivid than similar information that is 'known' (Hyman et al., 1998).

Participants report fewer false memories when they are asked to identify the source of their memories (Henkel et al., 2000, Experiment 2). Henkel et al. examined the source errors that were most likely to occur when participants saw, heard, imagined seeing or imagined hearing a series of common events such as a toilet flushing or a balloon popping. In some of the experimental trials participants experienced the same event from two different sources; for example, at trial one a participant heard the sound of a balloon popping and in another trial the same participant imagined the sound of the balloon popping. The results revealed that source errors, claims that the event was seen, were highest in the imagined seeing and hearing condition. Henkel et al. suggested that hearing an event can cause participants to believe that the event was seen because 'spontaneous visual imagery may occur when hearing an event, which may in turn be mistaken as evidence or physical imagery' (Henkel et al., 2000, p. 331). This finding is relevant for the present study because video and audio stimuli were presented to participants. In a related

study Kahan, Mohsen, Tandez and McDonald (1999) reported poor discrimination between actual and imagined taste experiences when participants relied on sensory information than cognitive information in making source judgements.

Source accuracy can be measured along with other judgements, confidence ratings and remember/know states, to evaluate response accuracy. A 'remember' judgement is regarded by some theorists as an implicit source judgement (Hyman et al., 1998) but a 'remember' judgement is viewed as a less stringent test of accuracy than a source judgement (Multhaup et al., 1999). The reliability of eyewitness reports is expected to increase when witnesses are requested to identify their state of awareness accompanying retrieval and the source of the information. The remember/know model assumes that 'remembering' is a sufficient condition for accuracy, but the SMF contends that recollection is not a perfect process. The act of re-experiencing an event can result in source mis-attributions, attributing an event to the wrong context (Dobson & Johnson, 1996, Experiment 1). Errors result from the same cognitive processes, for example 'remembering', that produce accurate memories (Multhaup et al., 1999). In reflecting on past actions people may 'remember' information that favours their decisions and so engage in 'choice-supported memory distortion' (Mather et al., 2000).

Evidence that remembering can lead to distortions in memory, raises concern about the reliability of remember-based eyewitness recollections (Bruck, Ceci & Hembrooke, 1998). The value of research modelled after the SMF is to identify the conditions that facilitate or impede efficient source monitoring. Experimental results reveal the conditions under which 'remembering' is unreliable. For example, source mis-attributions increase in relation to the similarity between sources of information (Henkel et al., 2000; Mazzoni & Loftus, 1996). Participants in the study by Mazzoni and Loftus reported that they remembered words previously presented to them during a 'dream' and an 'awake' state, were easily confused about the source of their knowledge.

The relationship between memory for source and memory for event material is at the heart of the SMF. Source accuracy is different to, although it aids, accurate event memory. Source memory is independent of memory for items (Lindsay, 1990) because memory for source is not tagged or encoded to memory for content details (Zaragoza & Lane, 1994). Source accuracy is not always the product of recollection and identifying the

origins of one's experiences may not be necessary to answer a question (Dobson & Johnson, 1996). The dependency on source material is related to the requirements of a task. Recognition accuracy may be due to familiarity with an answer, rather than the recollection of source material (Dobson & Johnson, 1996). One of the problems in recollecting specific incidents is that of separating the 'target' episode from similar situations. Source identification can reduce schematic recall, but when memory for source material is unavailable the partial retrieval of events can be supplemented by a reliance on schematic knowledge (Johnson et al., 1996). Errors based on schemas are briefly discussed in the next sub-section because the reporting of schematic information accompanies a 'know' more than a 'remember' state of awareness at retrieval (Gardiner et al., 1996).

1.7. Schema Theory

Schemas are mental representations which are characterised by a fixed core of knowledge with some variable information contained in memory organisation packets (MOPs) and thematic organization points (Schank, 1982). Person and event schemas exist and the latter consist of 'scripts' of events or social activities accompanied by details or 'scenes' of those events. Once a schema is formed, memory of specific details declines (Pressley & Van Meter, 1994). Schemas are functional when they assist cognitive functioning and prevent information overload by filtering in-coming information on the basis of information already known. Conversely, schemas are dysfunctional when schema-consistent material is attended to, elaborated upon (Bransford & Johnson, 1972; Erdfelder & Bredenkamp, 1998) or retrieved (Brewer & McNamara, 1984), while schema-inconsistent information is either ignored or distorted (Schank, Collins & Hunter, 1986).

Schemas allow gaps in knowledge to be 'filled in' and the suppositions made extend actual information (Intraub, Gottesman & Bills, 1998). Intraub et al. reported a 'boundary extension' illusion in which observers remembered seeing a greater expanse of scenery than was shown. The inability to discriminate between a target event and similar experiences, a source monitoring error, results in a 'coloration' of the target event with details from the related events (Schank et al., 1986). Inferences and source confusion reduce the reliability of reports given by adults (Mantyla, 1993) and children (Wark, Memon, Kohnken & Bull, 1995). Inaccurate retrieval can inspire confidence in memory (Johnson & Raye, 1981).

There is a link between the state of awareness at retrieval and the tendency to rely on schematic recall. Schemas are less likely to be activated during a 'remember' state of awareness (Mantyla, 1993). The ability to discriminate a target event from similar incidents is better when the relevant contextual details associated with the target event can be re-lived or re-experienced. In the absence of conscious recollection, familiarity with the contextual details of related events leads to source confusion. Consequently, more 'know' than 'remember' judgements accompany schematic recall (Gardiner et al., 1996). An immediate memory test (Diges, 1996) and the recall of realistic events (Wynn & Logie, 1998) reduce the reliance on schemas. Source confusion increases with the passage of time and realistic events have more 'atypical' features that distinguish them from schematic knowledge.

1.8. Effects of detail type on memory and metamemory

The influence of detail type, central and peripheral, to eyewitness accuracy and the reliability of CA judgements was examined in the thesis because both types of information are required by the legal system. The police understand that crime-related details may become fuzzy with the passage of time, but they believe that the essential or salient information should remain constant. Barristers evaluate the changes or the consistency in the account of central matters over repeated questioning, to assess the reliability of eyewitness testimony (Heaton-Armstrong & Wolchover, 1992). Detailed information, both central and peripheral to an event, increases the acceptability of testimony by the jury (Freedman, Adam, Davey & Koegl, 1996). The reporting of trivial or peripheral details, in particular, can be very persuasive for the jury because it is an indication that a witness was exceptionally attentive to events and is likely to be reliable when reporting the critical details (Bell & Loftus, 1988, 1989; Heath, Grannemann, Sawa & Hodge, 1997; Wells, Ferguson & Lindsay, 1981).

These expectations of eyewitness memory have been examined empirically. Previous research has defined centrality, or detail salience, through either subjective means (where participants identified as 'central' the detail they felt to be important), or through objective means (where central details were identified as those 'critical to the course of the event'). The definitions of 'central' and 'peripheral' details used in the thesis were

modelled after Burke, Heuer and Reisberg (1992). Burke et al. described 'central' details as being 'plot relevant' and relating to the main course of events, while 'peripheral' details comprise background information which is irrelevant to the main event. In a forensic context what is regarded as a 'central' aspect of a crime may be determined by the police, but it generally follows Burke et al.'s definition. In an experimental context 'standardized' definitions of 'central' and 'peripheral' are useful in order to compare performance across eyewitnesses.

Regardless of how 'centrality' is defined, the psychological evidence reveals that response accuracy and confidence are higher for central than peripheral details (Burke, Heuer, & Reisberg, 1992; Freedman et al., 1996; Heath & Erickson, 1998; Migueles & Garcia-Bajos, 1999; Wright & Stroud, 1998). Accurate memory may reflect the strength of a memory trace and the weaker the memory, the greater is the effect of misinformation (Wright & Stroud, 1998), post event information (Loftus, 1979) or conformity to co-witness reports (Wright et al., 2000).

There are several explanations for superior central detail memory. Attentional focus theories discuss a 'cue utilisation hypothesis' (Easterbrook, 1959) and 'cognitive tunnelling' (Dirkin, 1983). These explanations hinge on physiological arousal which re-directs attention away from competing stimuli and focuses attention to the most important or critical information pertinent to an event. The selective attention to central details occurs at the expense of memory for peripheral information. This narrowing of attentional focus to 'central' detail material, e.g. the presence of a weapon, led to the term 'weapon-focus' effect in the eyewitness literature (Loftus, Loftus & Messo, 1987).

Experimental evidence that witnesses report central details more accurately than peripheral information led to the conclusion that central details attracted more attention than peripheral ones. Using a different methodology in which eye movement was tracked and eye fixations measured, Christianson, Loftus, Hoffman and Loftus (1991) evaluated the period of eye fixations when witnesses were presented with central and peripheral information. They reported that witnesses fixated on central details that were emotionally arousing, distinctive and informative.

Among the episodic trace models, one of the best known is the Search of Associated Memory model (SAM) developed by Raaijmakers and Shiffrin (1980; 1981) and discussed

by Raaijmakers and Shriffrin (1992). The SAM model assumes that the process of activating information is almost the same in recall and recognition. Successful retrieval is contextually dependent, particularly on the strength of the memory trace compared to other traces. This model can potentially explain why central details, which are attended to and encoded with strong memory traces, are more accurately retrieved than peripheral details. In the SAM model each word in long-term store is associated, to some varying degree, with a representation of the context (Smith, 1994). SAM uses a memory probe, a mechanism that assembles information for searching memory, which may be generated from cues in the question asked or cues from a previous memory search. The probe samples information in memory and elicits retrieval of memory traces that are associated with it. SAM's emphasis on the overlapping of cue information and associated memory traces is present in other episodic memory models; for example, the 'encoding specificity' and 'feature overlap' concepts are key elements of Tulving's (1983) GAPS framework.

The type of detail accessed determines source monitoring efficiency. The Source Monitoring Framework (SMF) emphasises the importance of verifying the accuracy of one's memories by locating the source of that knowledge. Peripheral information, for example, memory for colour and location, contain details which assist in source-identification (Johnson et al., 1996; Johnson, 1997). The selective attention to central details implies that they are better encoded with contextual information than peripheral details. Thus one may expect source accuracy to be higher for central than peripheral details. Conversely, memory for peripheral events is likely to be supplemented by schematic knowledge, to be attributed to the wrong source, or to decay over time.

Fuzzy trace theory (Brainerd & Reyna, 1998a) describes what aspects of memories are likely to be retained over time. Brainerd and Reyna developed the concepts 'verbatim' and 'gist' material to explain their theory. Verbatim material contains the specific details of an experience which are accessible during a 'remember' state of awareness at retrieval. In contrast, the 'gist' or main ideas of an event can be either remembered or known. Accuracy is greater for 'gist' material because 'verbatim' material decays over time. There is a debate over how 'gist' and 'verbatim' knowledge develop. Brainerd and Reyna (1998) believe that gist information is extracted from the verbatim material; however, there is evidence that gist and verbatim develop and are retrieved independently (Reyna & Kiernan, 1994). The data

reported by Reyna and Kiernan (1994) showed correct recognition for verbatim material and the mis-recognition of gist information. The important point is a 'remember' state of awareness at retrieval can facilitate memory for 'gist' and 'verbatim' material.

In contrast to attentional focus theories, a more optimistic view of eyewitness memory is presented in the remember/know paradigm and the SMF. Tulving's (1985) remember/know distinction is premised on the view that the re-experiencing, conscious awareness and mental context reinstatement that define a 'remember' state of awareness, facilitate memory for all types of information. This implies that remembering enables the reporting of the main, 'central' and associated 'peripheral' details, more than a 'know' retrieval state. Similarly, the SMF assumes that source monitoring for all details, regardless of the centrality of the event, is facilitated by the ability to remember events. Remembering accesses contextual, source, and the target information. The extent to which a 'remember' state of awareness is associated with improvement in central and peripheral detail memory, than a 'know' state of awareness was the primary research issue investigated in Part One of the thesis.

Overall, a 'remember' state of awareness is expected to lead to higher response accuracy than a 'know' retrieval state. However, given the psychological evidence for better central memory, ceiling effects in reporting central detail information may mean that only memory for peripheral events will significantly improve. Enhancing memory for background, peripheral details is theoretically and forensically relevant and the identification of a state of awareness that facilitates memory for peripheral details is a high priority.

1.9 Developmental differences in memory and metamemory

An important contribution of this thesis was the examination of how the state of awareness accompanying children's eyewitness reports, relates to their accuracy and the reliability of their CA judgements. The experiments reported in this thesis fill a gap in the CA literature as current research examines children's accuracy and confidence separately (Ling & Blades, 1996; Shrimpton, Oates & Hayes, 1998). There is one reported study of the strength of the eyewitness CA association (Sykes, Gruneberg & Turner, 1988) in which the association was a significant, but negative one. These researchers obtained a CA correlation of ($r = -$

.49) when an immediate recognition test was conducted with 8-10 year olds. The data indicate that children need assistance to reliably match confidence and accuracy. Consequently, asking children to be aware of their state of awareness at retrieval and to locate the source of their knowledge was expected to facilitate strong, positive CA correlations. Additionally, more research is needed to identify the strengths and weaknesses of children's CA processing skills under various retrieval conditions.

There is a practical reason for investigating the reliability of children's evidence because of their participation in the legal system as victims and perpetrators. Between October 1992 and April 1994, 1561 children, ranging in age from 3-18 years ($M = 12$ years), gave evidence in the Crown Courts in England (Davies, Wilson, Mitchell & Milsom, 1997). Some magistrates and judges believe that children's competence to testify, or their ability to accurately report events, is between 12-13 years (Cashmore & Bussey, 1996). However, developmental psychologists disagree and claim that by the end of the pre-school age children realise that the word *know* expresses more certainty than the words *think* or *guess*. By the age of 6, children can differentiate between fantasy and reality (Flavell, 1999; Lindsay, Johnson & Kwon, 1991) and they can distinguish between 'remembering', 'knowing' and 'guessing' (Estes, 1994; Perner & Ruffman, 1995; Toplis, 1997).

Children's competence to give evidence seems to occur before the adolescent period identified by the magistrates and judges in Cashmore and Bussey's study. Although memory is age-dependent, with young children being less accurate in reporting events compared to older children and adults (Foley & Ratner, 1998; McBrien & Dagenbach, 1998, Experiment 1), performance varies according to the task demands. Psychological studies identify techniques for improving the accuracy of children's observations (Gee & Pipe, 1995), but less attention has been placed in identifying the factors that underlie their confidence-accuracy processing.

It is also forensically relevant to consider the effect of detail type on children's memory. Davies et al. (1997) reported that prosecutors question children about the central detail events surrounding an offense, while defence barristers are more interested in the peripheral details of the incident. Although the courts assume that children possess an equivalent ability to report both the central or critical details, along with the minutiae and

peripheral details, attentional focus theorists predict better memory for central information. The accuracy of children's memory is dependent upon the type of information reported (Batterman-Faunce & Goodman, 1993) with greater accuracy for central details than peripheral ones (Cassel & Bjorklund, 1995; Gobbo, 2000; Poole & White, 1991). However, less is known about the influence of detail type in other aspects of children's memory including confidence and the strength of the CA correlation.

Children's source monitoring skills

The empirical evidence indicates that children under the age of 10 years are less efficient at source monitoring than adults (Coxon & Valentine, 1997; Lindsay, Gonzales & Eso, 1995; McBrien & Dagenbach, 1998, Experiment 1; Poole & Lindsay, 1995; Roberts & Blades, 1996), and this makes them less reliable eye-witnesses than adults. However, Lindsay et al. (1991) stress that source monitoring is not a skill that children acquire at a particular age; instead, source monitoring involves decisions based on various aspects of memory. The inability to identify the source of relevant information reduces the retrieval cues children have for reporting specific details. The SMF attributes a differential in central and peripheral detail memory to source mis-attribution errors, but these source errors are reduced when memories can be remembered.

Children's poor performance has been attributed to their limited processing skills which makes them unable to retain a 'true' account of events (Goodman & Schaaf, 1997), and their inability to use mnemonics or efficient memory strategies (Ghatala, Levin, Pressley & Goodwin, 1986; Pressley, Levin & Ghatala, 1984). Memory strategies are deliberate plans that are adopted to improve performance and they are subject to conscious use and evaluation (Bjorklund, 1988). However, Flavell and colleagues (Flavell, 1971; Flavell & Wellman, 1977) disagree and insist that children do not lack the ability to engage in source monitoring, but they lack the ability to spontaneously use meta-memory strategies. Retrieval strategies, such as the provision of contextual cues, that facilitate adults' memories are more beneficial to children than adults (Gee & Pipe, 1995; Priestley & Pipe, 1999), because there is more scope for improving children's performance to the level of adults' accuracy. More importantly, emphasising that the interviewer is interested only in 'personal experiences' improves accuracy (Poole & Lindsay, 1998; Quas, Goodman,

Bidrose, Pipe, Craw & Ablin, 1999) in two ways. First, children are more willing to indicate a lack of knowledge (Cassel & Bjorklund, 1995); and second, it reduces their tendency to 'guess' on a recognition test (Ochsner, Zaragoza & Mitchell, 1999). In light of this evidence, it was expected that the ability to 'remember' events will improve the accuracy and confidence of children's eyewitness reports, in the same way as it enhances the autobiographical memories of adults (Hyman et al., 1998) and children's recall of words and objects (Toplis, 1997).

1.10 Predictions

The remember/know paradigm and the Source Monitoring Framework emphasise the importance of the phenomenal experiences of a 'rememberer' in judging the accuracy of memories. The main argument presented in the thesis is that the benefits to word recall and autobiographical memories derived during a 'remember' state of awareness at retrieval could potentially facilitate eyewitness memory. Specifically, response accuracy, confidence and the confidence-accuracy association are expected to improve during a 'remember' state of awareness at retrieval than a 'know' one. Two other predictions relating to the SMF are examined (1) a 'remember' retrieval state is expected to facilitate source accuracy more than a 'know' retrieval state, and (2) source accuracy is expected to improve memory for the event. These issues are examined in relation to detail type (central, peripheral) across eyewitness age (adult, child) and test (recall, recognition).

CHAPTER TWO

Experiment 1a: The Relationship between States of Awareness, Confidence-Accuracy Judgements and Source Monitoring Accuracy following Delayed Recall

“Recall requires extensive reinstatement of the learning event.” (Haist, Shimamura & Squire, 1992, p. 691)

Introduction

This experiment examined the extent to which a ‘remember’ state of awareness at retrieval improves eyewitness recall accuracy, confidence and the confidence-accuracy (CA) association, more than a ‘know’ retrieval state. The novelty of the present study is the application of the remember/know procedure to the study of eyewitness memory. Although less is known about the effectiveness of ‘remembering’ in facilitating eyewitness reports, the ‘phenomenological experiences’ of a witness are used to evaluate the credibility of the witness and the testimony provided (Gardiner et al., 1997). The Cognitive Interview (CI) and the Criterion-Based Content Analysis (CBCA) distinguish true from false testimony on the basis of the states of awareness accompanying witness reports. Descriptions of time and places, thoughts and feelings associated with an event increase the credibility and reliability of a witness. Therefore, it is important to understand how the retrieval state of a witness actually contributes to performance.

The present study was based on evidence that remembering enhances response accuracy and confidence when recalling words (Toplis, 1997, Experiment 1; Tulving, 1985, Experiment 1) and autobiographical memories (Hyman et al., 1998). The accuracy of recollective memory and certainty in responses are attributed to the ability to reinstate an experience (Haist et al., 1992), to be consciously aware of all information pertaining to that incident and to contextualise the event (Tulving, 1985), and the efficiency in locating the source of a memory in order to verify its accuracy (Johnson & Raye, 1981; Johnson et al., 1993).

Several episodic memory trace models emphasise the importance of context dependency, feature-overlap, and trace strength to successful retrieval (e.g. SAM model, GAPS framework). Context refers to the large body of knowledge contained in episodic

memory which is linked to some memory for a specific target detail. For example, if a witness is asked to describe the perpetrator of a crime, the contextual details may include the clothing, facial features and actions of that individual. Contextual details include 'central' information, that is critical to the main course of actions, and 'peripheral' or background information. According to the SAM model, recall involves an intentional and effortful search for information based on several memory searches in which a probe is matched for associated contextual information (Raaijmakers & Shiffrin, 1992). The ability to access contextual central and peripheral details is more likely under a 'remember' than a 'know' state of awareness. Given the unreliability of the eyewitness CA association (Bornstein & Zickafoose, 1999; Perfect & Hollins, 1996), requesting witnesses to identify their state of awareness at retrieval, to estimate their confidence in their memories and to locate the source of their knowledge, are expected to facilitate eyewitness memory and enhance the reliability of CA judgements. Three specific issues are examined in the present study: (1) the relationship between states of awareness to accuracy, confidence and the CA association, (2) the relationship between states of awareness to source accuracy, and (3) the relationship between source accuracy and event accuracy. Memory for the central and peripheral details of an eye-witnessed event was evaluated after a delay of 24 hours. The literature review summarises the current evidence from studies modelled after the remember/know procedure and the source monitoring framework (SMF).

Tulving (1985, Experiment 1) examined the state of awareness underlying the reporting of words immediately after they were presented to undergraduates. Participants gave a 'remember' or a 'know' judgement for each word they recalled. Tulving reported that 'remember' judgements were associated with greater response accuracy than 'know' judgements. Experiments modelled after Tulving's remember/know paradigm, but with various degrees of modification, confirm the benefits of remember-based recollection. Toplis (1997, Experiment 1) measured the cued recall accuracy of middle aged adults for items on a word list. Participants in Toplis's study made one of three judgements, remember, know and guess, for each word recalled. The results patterned those reported by Tulving (1985, Experiment 1). The percentage of correct responses was significantly higher for words 'remembered' than 'known'. Interestingly, equivalent percentages of correct responses were classified as known and guessed. Overall Toplis's data illustrated that

recollective-memory is more reliable than information that is merely familiar.

The effect of the state of awareness accompanying retrieval on participants' confidence in memory was not considered in the experiments reported by Tulving and Toplis, but this was examined in the present study. Recent studies favour the use of the 'proportion of accurate responses' as a more reliable index of memory than the 'hit' rate or number of accurate responses (Donaldson, 1996). The proportion of accurate responses takes into account the number of correct items as a proportion of the correct and incorrect items reported in each experimental condition. This measure of accuracy was used in the thesis.

2.1 Source monitoring and recall accuracy

Studies modelled after the SMF can be used to explain the data from remember/know experiments. Recollection is not a perfect process (Dodson & Johnson, 1996) and the process of remembering can lead to false memories for words (Roediger & McDermott, 1995). Requesting participants to confirm their knowledge by identifying the source of their information raises the criterion of accuracy when reporting events (Johnson, 1997). Given this, some studies combine the remember/know procedure with a source monitoring task. Hyman et al. (1998, Experiment 2) extended the remember/know paradigm to source monitoring in autobiographical memory and their application of the remember/know procedure varied from the one used by Tulving and Toplis.

Undergraduates were given descriptions of remember, know and unsure and they were asked to provide a childhood experience that fitted one of the three descriptions. Half of the participants were asked to form a mental image of the experience and they answered questions pertaining to the visual imagery, sensory imagery and emotion of this event. The other half functioned as the control group. All participants rated their autobiographical memory on a 7-point scale from know to remember, with unsure being placed in the middle of the continuum. The data revealed that 'remembered' childhood memories had more clarity, temporal and location details, than similar information 'known'. Based on these data Hyman et al. concluded that the remember/know judgement is an assessment of the quality of the memory. Using the same procedure outlined above, participants in Hyman's subsequent experiment gave a remember/know judgement and a confidence rating for their

autobiographical memories. The results revealed higher confidence in remembered events than unsure ones, another indication that the ability to be consciously aware of events increases confidence in memories.

Tulving predicted that a 'remember' retrieval state produces reliable memory (Tulving, 1985). However, one can recollect the contextual information from a related, unrequested event, as easily as one can recollect a specified 'target' event. Source monitoring studies in which neither remember/know nor confidence judgements were measured, report that recollection leads to source confusion and the acceptance of misinformation (Higham, 1998). Higham reported that witnesses to a videotaped simulated armed robbery were more likely to report that they remembered seeing misinformation that they had read about. Source errors are likely to occur if the actual and imagined event share similar characteristics (Henkel et al., 2000), such as physical similarity (Henkel, & Franklin, 1998). In an elegant design Henkel et al. (2000) examined the conditions that would cause cross-modality source mis-attributions, a situation that reduces the reliability of eyewitness reports. Cross-modality source mis-attributions occur when individuals report 'seeing' something, that was not seen but experienced in another way. Although witnesses can confuse real and imagined events, they are more likely to experience cross-modality source errors as they can be exposed to information from a variety of sources.

Since participants report fewer false memories when they are asked to identify the source of their memory (Henkel et al., 2000, Experiment 2), the present experiment evaluated the contribution of remember/know judgements to response accuracy and the confidence-accuracy relationship on a source monitoring task. Given the predictions of the remember/know model, the SMF and the results of Henkel et al. it was expected that a 'remember' state of awareness would accompany more accurate responses and a more reliable CA association, than a 'know' state of awareness. It was also expected that source-discrimination would be more accurate during a remember, than a 'know' retrieval state. Finally, it was anticipated that source accuracy would lead to substantial improvements in overall content accuracy. Requesting both source and confidence judgements should also improve accuracy and confidence because a source decision raises the criterion participants must consider in deciding whether to report or withhold information (Johnson, 1997).

2.2 The relationship between detail type and memory

The influence of detail type, specifically the centrality of the information, to response accuracy is outlined in attentional focus and fuzzy trace theory as well as the source monitoring framework. There is a substantial body of evidence that memory for central details is more accurate than memory for peripheral ones (Christianson et al, 1991; Heath & Erickson, 1998; Migueles & Garcia-Bajos, 1999; Wright & Stroud, 1998). The accuracy of central and peripheral detail memory is most commonly examined within a misinformation paradigm (Heath & Erickson, 1998; Wright & Stroud, 1998). Heath and Erickson examined the extent to which memory for central and peripheral details can be susceptible to the inclusion of post-event misinformation. Undergraduates viewed a slide presentation and later read a narrative of the event shown in the slides. In the narrative a critical item shown in the slides was left unchanged, replaced with another item or an incorrect detail was added.

Memory for central and peripheral actions was evaluated on a cued-recall test and as well as a source test 10 minutes after the information was presented to participants. Heath and Erickson found that participants were more accurate in reporting central than peripheral details and accuracy was higher when events in the narrative remained the same as the ones presented in the slides. When a peripheral item was changed in the narrative, participants recalled the narrative change than the slide item. Hence peripheral detail memory was more susceptible to the incorporation of post-event mis-information and to source monitoring confusion. Memory for source was less accurate when the post-event narratives contained changed information or additional details. The important results of this study to the present experiment are better central detail memory, and the consequences of poorer memory for peripheral details, source mis-attributions.

Migueles and Garcia-Bajos (1999) examined memory of the central and peripheral details of a video-taped event relating to a kidnapping. The definitions of central and peripheral details were modelled after Burke et al. (1992); that is, 'central' details related to the main event, the kidnapping, while 'peripheral' details constituted the background details represented in the remaining scenes. Migueles and Garcia-Bajos reported that the distribution of attentional resources was different for actions and details in central than peripheral information. Recall accuracy was balanced in the reporting of peripheral

'actions', directly observable behaviours or facts, and peripheral 'details'. However, central 'actions' were reported more accurately than central 'details'. Confidence ratings followed the same pattern as the accuracy data. Witnesses were equally confident when reporting peripheral 'actions' and peripheral 'details', but they expressed more confidence when they reported central 'actions' than central 'details'. In the present study, 'central' details contained both 'actions' and 'details' but these were not measured separately.

Although confidence ratings in performance were obtained in the study by Heath and Erickson, the data were not analysed in relation to recall accuracy and source accuracy. Migueles and Garcia-Bajos evaluated accuracy and confidence separately but they did not analyse the confidence-accuracy relationship. The contribution of the present study to the literature takes into account how detail type influences confidence in memory and the reliability of confidence-accuracy judgements. The assumptions of the remember/know paradigm and the SMF are that mental context reinstatement and the accompanying 'remember' retrieval state would facilitate memory for all information, central and peripheral to an event.

2.3 The confidence-accuracy relationship

The confidence-accuracy relationship has, to date, not been assessed in relation to the remember/know state of awareness at retrieval or source monitoring accuracy. It is an established finding that the CA association is more reliable for general knowledge events than eyewitness memory (e.g., Perfect & Hollins, 1996), but there are some optimal conditions under which reliable confidence-accuracy judgements can be expected for eyewitness memory. The CA correlation for eyewitness memory of a filmed event is (.64) when a mixed question format is used and questions are not presented in a blocked format according to the contents of the stimuli presented (Hollins & Perfect, 1997, Experiment 1). In the present study questions on the memory test were presented in the same chronological order in which the stimulus material was presented. Peripheral and central detail questions were interlaced so that the question format was akin to the mixed format described by Hollins and Perfect. A methodologically important finding of Hollins and Perfect's study was that although the mean number of correct responses was better for a mixed-question format and for eye-witnessed memory, these effects disappeared when accuracy was

measured as the proportion of accurate responses. The inconsistent results reported in the literature relating to the reliability of eyewitness memory and the strength of the CA relationship appear to be related to the way in which different studies evaluate accuracy.

Although one may expect that memory decreases with time, confidence is predictive of accuracy even after a delay in testing. Ebbesen and Rienick (1998) reported that descriptions of suspects were highly correlated with accuracy after a 1 day and a 28 day retention interval. More importantly, although the number of correct facts decayed over time, the percentage of recalled facts that were in error remained constant. Perfect and Hollins (1996) examined memory for a video-taped crime-related event 24 hours after the information was presented. The researchers obtained a statistically significant CA correlation of (.54) for eyewitness memory compared to (.65) for memory of general knowledge events. Based on these results it was expected that a retention interval of 24 hours in the present experiment would also lead to significant CA correlations, particularly for information classified as 'remembered'. Robinson and Johnson (1996) also showed participants a video-taped crime event and tested memory 7 minutes after the event. They obtained a within-subject correlation of ($r = .58$). A consistent finding in the eyewitness literature is reliable within-subject confidence-accuracy correlations (Hollins & Perfect, 1997; Robinson & Johnson, 1996), so in the present study remember/know judgements and detail type were treated as within-subject measures. This design was expected to increase the probability of obtaining reliable CA correlations.

2.4 A methodological note

Some experiments modelled after the remember/know procedure required participants to give a remember or a know response to all questions, guessing if possible (e.g., Toplis, 1997). In the absence of a 'don't know' option, guess responses may become confounded with 'know' judgements as 'know' responses are used as a proxy for guessing (Gardiner et al., 1998; Gardiner & Richardson-Klavehn, 1999). This method would make the contribution of remember/know states of awareness to response accuracy and confidence more difficult to interpret. Participants in the present study were discouraged from guessing. Participants identified the state of awareness accompanying each answer on the memory test. The main reason for this departure from Tulving's remember/know

dichotomous option is a practical one. Eyewitnesses are discouraged by the police from guessing but encouraged to indicate their lack of knowledge of events. The use of a delay was relevant as witnesses may not report an incident immediately.

2.5 Predictions and method

Data from previous remember/know studies suggest that accurate responses and higher confidence ratings accompany 'remember' than 'know' judgements. It was expected that these benefits would extend to the confidence-accuracy relationship. A 'remember' retrieval state is assumed to increase response accuracy for all information relating to an event, and this was assessed in relation to central and peripheral details.

Method

Design

A 2 x 2 mixed factorial design was used in which State of Awareness judgements (remember, know) and Detail Type (central, peripheral) were within-subjects variables. Participants were presented with information from a video-taped and an audio-taped event to evaluate source accuracy. All groups saw the identical video clip but the presentation order of Information Type was counterbalanced across four groups who received either the video information plus audio additional information, additional audio information plus video information, video information plus irrelevant audio information, or irrelevant audio information plus video information. Following presentation of the to-be-remembered event, all participants completed a self-administered cued-recall test.

Participants

One hundred and sixty-seven A' Level students and undergraduates (113 women, 54 men) ranging in age from 16-35 years, ($M = 19$ years), completed all stages of the memory test. One hundred and twenty undergraduates were recruited from the Department of Psychology, University of Southampton. They participated in the study for research credits. Participants were told in advance that they would obtain 4 credits in return for their attendance on two consecutive days. Participants agreed to this condition before participating in the research. Consequently, there was no drop-out of undergraduates in the

study. A' level psychology students were recruited from Fareham College. They were unpaid but participated in the study as a practical exercise in the memory component of their A'level psychology course. Forty-nine students viewed the film clip and 47 completed the memory test. Participants were randomly assigned to one of the four groups previously described. Gender of the participants was balanced as far as possible across the groups. Participants were presented with the stimulus material in groups of 12-18 students.

Materials

To-be-remembered event

A brief description of the video event is provided here but a more detailed transcript is given in the Appendix in Volume 2. The video event was based on a chase in which 3 men riding bicycles pursued a man, the 'hero' in the film, and a woman through the streets of a market place. During the chase the hero, tried to elude his pursuers in a series of clever ways. On one occasion he told the woman to hide in a market-stall, then he dressed a doll as a decoy in the woman's clothes. While running through the streets of the market, to escape the men who were chasing him, the hero knocked over a police Captain. The police Captain recognised the hero as being someone who had previously deserted the police force. The Captain arrested the hero by handcuffing him but he was able to escape from the Captain as well as the Captain's policemen.

Video Information

The to-be-remembered video event was a film clip of a novel event lasting 1 minute, 15 seconds. Eight central and eight peripheral detail questions pertaining to the film were devised and these were presented in a chronological order with respect to the events of the film. Designation of items as central or peripheral was made on the basis of the definitions provided by Burke et al. (1992). Burke et al. classified central details as 'plot relevant' and peripheral details as 'plot irrelevant' or 'background'. Inter-rater reliability in classifying central and peripheral detail items was obtained by evaluating the number of agreed items/total number of items. Inter-rater reliability was 83 % with rater-agreement on 25 of the 30 test items. Extending the definition of 'central' details to include all details relevant to the main events and characters increased inter-rater agreement to 95 % for all the test

items. Although attempts were made to ensure that items defined as 'central' details covered the key plot events, some central details covered more than key actions and events. This could have weakened the aim of the research to differentiate between central and peripheral details and it has the potential for reducing the size of any potential differences between the two conditions. In answering each of the questions, participants either filled in their answer in the space provided or wrote 'I do not know the answer'. The video event was viewed on a Panasonic 24 inch colour monitor via a Panasonic AG6200 Video Recorder.

Additional Information

The additional information was taken from another portion of the video clip. A transcript is provided in the Appendix. Three independent raters viewed the clip and created seven central and seven peripheral detail questions. Inter-rater reliability was 95 % across all the test items. The additional information was presented as an audio report lasting 1 minute, 24 seconds to participants who listened to the material on a Panasonic RQ-L307 mini cassette recorder.

Irrelevant Information

The irrelevant information was created from a story involving 4 children playing football. A transcript is included in the Appendix. Three independent raters listened to the audio report of the irrelevant information and generated 7 'central' and 7 'peripheral' detail questions using the modified definitions of 'central' and 'peripheral' details provided by Burke et al. (1992). Inter-rater reliability was 98 % across all 14 of the test items. The irrelevant material was presented as an audio report to participants and the narrative lasted 1 minute, 22 seconds. The report was played on a Panasonic RQ-L307 mini cassette recorder. The irrelevant information was used as a baseline measure for recalling the video-related additional information.

Questionnaire

Video plus Additional Information

Thirty-one questions were devised, the first of which was a practise question and

formed no part of the data analysis. The remaining thirty questions were based on information presented in both the video and the additional information audio report. The thirty questions pertained to central ($n = 15$) and peripheral details ($n = 15$) and the questions were listed in chronological order with respect to the sequence of events in the film clip. Care was taken to avoid duplication of events in the video and the audio material. Hence the answers to earlier questions could not inform the answers to later questions on the memory test.

Video plus Irrelevant Information

As in the video plus additional information group, thirty-one questions were created, the first of which was a practise question and constituted no part of the data analysis. The 8 central and 8 peripheral detail questions pertaining to the video event were identical to those described previously. In addition there were 7 central and 7 peripheral questions containing the irrelevant information. The questions were not presented in a blocked format for video followed by audio-related questions. Instead the questions relating to the irrelevant audio narrative were placed in the identical spaces as those in the additional information report. The order of questions based on the irrelevant information were listed in chronological order with respect to events in the narrative. The difference in the contents of the video and audio reports ensured that there was no duplication of information in both stimuli.

Post-experimental questionnaire

Following the memory test a post-experimental questionnaire was administered. Participants were asked three questions. First, to state how easy it was to distinguish between the 'remember' and 'know' states of awareness. Responses were rated on a five-point bi-polar scale (where 1 = very easy, and 5 = very difficult). Participants subsequently gave reasons for their response. Second, participants were asked to state if they used any other means of answering the questions in addition to 'remembering' and 'knowing' the answers. Third, respondents were asked what made them confident in their responses.

Instructions

The instructions were written on the test questionnaire. Participants were required to identify if the answers to questions on the memory test were accompanied by a 'remember' or a 'know' state of awareness. Definitions of remembering and knowing were modelled after Gardiner (1988), Gardiner, Java and Richardson-Klavehn (1996) and Tulving (1983; 1985). The remember and know states of awareness were operationalised in the following way.

"When you answered the question, if you remembered SEEING or HEARING in your mind the information you needed to answer the question, then you REMEMBER the answer. If instead you simply had a feeling that 'I just know' the answer because it was familiar to me, then you KNOW the answer. Remembering is accompanied by a mental image or other auditory details but knowing is not. Please don't guess and try to be as accurate as possible. If you cannot answer the question, I want you to tell me if this was because (a) you did not know the answer or (b) you feel you would know the answer if I gave you some clues."

Following the training protocol used by Gardiner (1988), participants were given an example as a group to explain the difference between 'remember' and 'know' states of awareness. Specifically, they were asked two questions, 'Please tell me what you ate for breakfast this morning.' Participants verbally responded. The researcher then explained that if participants had a picture in their mind of what they did or said when eating breakfast when they answered the question, then they 'remembered' the answer. The second question was designed to demonstrate a 'know' state of awareness. Participants were asked, 'Now tell me what you ate for breakfast on this day two months ago.' Once again participants verbally responded. The researcher explained that if they could not consciously recollect the event and were unable to re-experience it or have a 'flash-back' or picture of having breakfast, they may simply 'know' that breakfast was eaten without having further details. Providing an example helped participants to understand the distinction between 'remembering' and 'knowing'.

All participants were asked if they were able to distinguish between 'remembering'

and 'knowing'. This provided a manipulation check for the remember/know distinction, rather than functioning as a criterion for excluding participants from the data analysis if they said that they could not distinguish between the two states of awareness. The comments from a random sample of 40 participants were used to assess what participants meant when they made a 'remember' or 'know' judgement. Thirty-five of the participants stated that it was 'moderately easy' or 'very easy' to separate 'remember' and 'know' states of awareness. The responses of some of the participants verified that the definitions were understood because they were "*explained clearly and presented easily*". More importantly, the feedback confirms that a 'remember' state of awareness was accompanied by a conscious awareness of the material previously presented and this led to the recollection and re-experiencing of events.

"If I could picture or hear the information in my head, I could remember it and if I couldn't picture/hear it, I knew it." - female 17 years.

"If I remember the answer I either had a firm recollection and could visualise the scene from the video or audio clip. If I knew the answer, the idea that came to me just seemed to fit." - male 16 years.

"It was easy because if you remember you have a clear image of what you saw. If you know it, it was more of a logical guess as well as a vague image." - male 18 years.

The latter quotation is particularly revealing in light of the comments in Chapter One expressed by Dienes and Perner (1999) regarding two types of 'know' responses. The first type of 'know' response comes readily to mind, but the second type of 'know' awareness is based on guessing. Furthermore, these authors contended that while 'remembering' or re-experiencing events can be easily differentiated from 'knowing', distinguishing between 'knowing' and 'guessing' is not as easy.

Five of the participants expressed difficulty in distinguishing remembering from knowing. Their feedback mirrored the conceptual concerns raised in the remember/know literature (Knowlton, 1998; Yonelinas & Jacoby, 1995) discussed in Chapter One.

"It was quite difficult because sometimes I couldn't quite remember but thought I knew" - female 17 years.

"Deciding when I remembered and knew the answer was hard because they seemed

very similar. But I remembered the key point being questioned or not so it was moderately easy." - female 19 years.

"I assume I know what I remember so it is difficult to distinguish between them." - female 20 years.

"It was moderately difficult as you don't know if you remembered the question or whether you are just using your prior knowledge of what would usually be the case." - female 20 years.

"It is difficult to understand the definition of 'know'; you remembered it so you know its true!" - female 16 years.

Participants were also asked if they used any other methods of reporting information other than 'remembering' and 'knowing'. Only 1 participant reported guessing.

Procedure

In the video plus audio additional information and the video plus audio irrelevant information groups participants watched the film clip in groups of 12-18 participants. There was a delay of 20-minutes before the audio material was presented. During this interval an audio recording of Andean music was played. Participants were asked to identify the musical instruments present in the recording and to comment on the mood evoked by the music. This interval allowed time for the contents of the video event to decay. There was also a delay of 20 minutes between the audio and video event in the audio additional information plus video group, and the audio irrelevant information plus video groups.

Twenty-four hours later participants completed a memory test via a self-administered questionnaire. A practice question was included at the beginning of the memory test to ensure that the task and the instructions were understood. Participants were given the opportunity to clarify the task before proceeding with the questionnaire. For each answered item on the recall test participants made three subsequent judgements (1) a confidence rating measured on a 5-point Likert scale (where 1 = not very confident, and 5 = very confident); (2) a source judgement, video or audiotape; and (3) a remember/know judgement. The order of the confidence, source and remember/know judgements was systematically varied using a Latin Square. Participants received one of three questionnaires in which the order of the judgements varied as follows: (1) remember/know, source and confidence judgements, (2)

source, confidence and remember/know judgements, and (3) confidence, remember/know and source judgements. A Latin Square minimises the 'sequence effect' that may occur when asking questions in a particular order, by distributing such effects equally across all the experimental conditions. Participants were asked not to discuss the task with each other and their performance was monitored by the researcher. The memory test was completed within 40 minutes.

2.6 Results

Eyewitness Recall

Only the responses pertaining to the video material were analysed. The audio material facilitated source discrimination and the data were not used in the analysis. The video data were collapsed across the judgement order in the analysis. For each item on the cued-recall test responses were categorized as either accurate, inaccurate, or don't know. The responses to the questions were scored in a 'blind' fashion; that is, regardless of the type of detail reported. This was done to prevent any bias in the data analysis. The data presented in Table 2.6.1 were obtained from the ANOVA analysis.

Total number of questions answered. The focus on analysing accuracy risked missing differences in the overall level of eyewitness responses. One way of redressing this issue is to evaluate the total number of questions participants answered, regardless of the accuracy of these responses, the state of awareness at retrieval or the type of detail reported. This would give an indication of the total amount of information pertaining to an eye-witnessed event that can be recalled after a 24 hour delay. Sixteen video-related questions were asked of all 167 participants. The mean number of questions answered and (standard deviation) was 8.69 (4.49). In general, participants reported just over half, 54 percent, of what they saw. A two-way, repeated measures Analysis of Variance (ANOVA) of the effects of retrieval state and detail to the total number of questions answered revealed a high number of responses for questions remembered ($F(1, 166) = 55.10, MSE = 342.04, p < .001$) and for peripheral details ($F(1, 166) = 27.84, MSE = 23.77, p < .001$). The interaction between state and detail was non-significant ($F(1, 166) < 1, MSE = 1.53, p > .05$). The mean (and standard deviations) for each experimental condition is summarised in the first row of the data presented in Table 2.6.1.

Number of correct responses. The mean number of questions participants correctly answered was 6, or 36 percent, of the 16 questions asked. A two-way, repeated measures (ANOVA) of the total number of correct responses by the state of awareness accompanying retrieval and detail type revealed that a 'remember' retrieval state was associated with more accurate responses than a 'know' retrieval state ($F(1, 166) = 84.47, MSE = 254.11, p < .001$). There were more accurate peripheral than central detail responses ($F(1, 166) = 22.54, MSE = 3.01, p < .001$). The interaction between retrieval state and detail was non-significant ($F(1, 166) < 1, MSE = .15, p > .05$). The mean numbers of correct responses across retrieval state and detail are summarised in the second row of Table 2.6.1. The data patterned the results previously presented on the number of central and peripheral details responses that were remembered and known.

The mean numbers of incorrect responses for all participants is listed in the third row of the data in Table 2.6.1. An ANOVA analysis to evaluate the effects of retrieval state and detail on the mean number of incorrect responses revealed more incorrect answers remembered than known ($F(1, 166) = 4.02, MSE = 6.52, p < .05$). There was no difference in the number of incorrect central and peripheral detail answers given ($F(1, 166) < 1, MSE = .58, p > .05$). The interaction between the two variables was non-significant ($F(1, 166) = 1.05, MSE = .73, p > .05$).

Table 2.6.1. *Mean number of number of questions answered, correct responses, incorrect responses and proportion accuracy across state of awareness and detail together with confidence ratings (and standard deviations).*

	Central Details		Peripheral Details	
	Know	Remember	Know	Remember
No. of questions answered	1.22 (1.43)	2.74 (2.22)	1.70 (1.70)	2.03 (2.07)
No. of correct responses	.64 (.96)	1.90 (1.90)	1.00 (1.25)	2.20 (1.79)
No. of incorrect responses	.58 (.86)	.84 (1.20)	.69 (1.00)	.83 (1.09)
Proportion Accurate	.47 (.37)	.73 (.33)	.57 (.38)	.71 (.36)
Confidence when accurate	2.66 (1.10)	3.90 (.91)	3.90 (.13)	2.96 (1.09)

Proportion of Accurate responses. The proportion of accurate responses was

calculated in relation to all retrieval attempts, accurate and inaccurate. The effects of state of awareness and detail on accuracy by means of an ANOVA analysis, necessitated data in all the experimental conditions. Consequently the number of participants was reduced from 167 to 70 participants. The proportion of accurate responses is cited in the fourth row of Table 2.6.1. One consequence of leaving out participants who were not regarded as 'valid' cases in the ANOVA analysis, is that a false impression of the overall proportion of accurate central and peripheral detail responses is given. The proportion of accurate responses was calculated using the formula, the number of correct responses/total questions answered. Overall, the number of cases, the mean proportion of accurate responses and (standard deviation) were 138, .69 (.35) respectively for central details remembered; 93, .49 (.40) respectively for central details known; 147, .72 (.33) respectively for peripheral details remembered; and 106, .60 (.37) respectively for peripheral details known.

An overview of the pattern of results shown in Table 2.6.1 based on 70 participants revealed a higher proportion of recall accuracy and confidence, in accurate responses, for information 'remembered' than 'known'. There was no substantial difference across detail in the proportion of accurate responses, or in the confidence of those responses. Separate analyses were conducted to investigate the effects of states of awareness and detail on the main issues under examination in this chapter; the proportion of accurate responses, confidence and the confidence-accuracy relationship. The results are presented in turn.

Proportion of accurate responses. The mean proportion of accurate responses ranged from .47 to .73 across the experimental conditions ($M = .62$). The proportions of accurate responses for central and peripheral details 'known' were low and this may be creating floor effects in the data. Analysis of the proportion of accurate responses by means of a two-way, repeated measures ANOVA, confirmed that recall accuracy was significantly higher for information remembered ($F(1, 69) = 27.125, MSE = 2.74, p < .025$) than information known. This finding was consistent with the experimental prediction and the memory literature. However, there was no evidence that memory for central details was more accurate ($F(1, 69) = 1.57, MSE = .08, p > .05$). The interaction between the two variables was non-significant ($F(1, 69) = 2.91, MSE = .24, p > .05$).

Confidence in Responses

There were insufficient cases to calculate a three-way, repeated measures ANOVA to examine the effects of state of awareness, detail and accuracy on confidence. A two-way, repeated measures ANOVA assessed the effects of state of awareness and detail on confidence levels when responses were accurate. The data were in line with the experimental prediction and the meta-memory literature. A 'remember' state of awareness attracted higher confidence ratings than a 'know' state of awareness ($F(1, 39) = 30.40$, $MSE = 47.57$, $p < .001$). Confidence was equivalent for central and peripheral details ($F(1, 39) = 2.46$, $MSE = .87$, $p > .05$). The interaction between the two factors was non-significant ($F(1, 39) = 1.46$, $MSE = .84$, $p > .05$).

To assess the difference between confidence levels when participants accurately and inaccurately reported information, a series of one-way, repeated measures ANOVA was conducted. The mean confidence rating (and standard deviation) when participants accurately and inaccurately remembered central details were 3.65 (1.00) and 2.97 (.90) respectively. The ANOVA analysis revealed that accurate responses were expressed more confidently than inaccurate ones ($F(1, 56) = 29.78$, $MSE = 13.13$, $p < .001$). Similarly, a one-way repeated measures ANOVA was conducted in order to evaluate the difference between confidence levels when participants accurately and inaccurately reported central details they knew. The mean confidence rating (and standard deviation) when participants were accurate and inaccurate were 2.64 (.93) and 2.65 (.98) respectively. There was no significant difference between accurate and inaccurate responses ($F(1, 39) < 1$, $MSE = .001$, $p > .05$).

The mean confidence rating (and standard deviation) when participants accurately and inaccurately remembered peripheral details were 3.64 (1.04) and 3.10 (1.04) respectively. Confidence was higher when participants were accurate ($F(1, 65) = 27.76$, $MSE = 9.67$, $p < .001$). However, confidence was equivalent when participants accurately and inaccurately reported peripheral details they knew ($F(1, 46) = 2.98$, $MSE = 1.31$, $p > .05$). The mean confidence rating (and standard deviation) when participants accurately and inaccurately knew peripheral details were 2.95 (1.11) and 2.72 (1.11) respectively. Overall, the data suggest that a 'remember' retrieval state is associated with higher confidence ratings in the accuracy of responses, than a 'know' state, regardless of the type of detail reported.

Given the benefits of recollective recall to response accuracy and confidence, the next analysis examines the relationship between state of awareness and the strength of the confidence-accuracy correlation. A preliminary examination of the preceding ANOVA results suggests that the CA correlation may be higher for information remembered than known.

The Confidence-Accuracy Association

The confidence-accuracy association was examined using Goodman-Kruskal's gamma. The CA relationship represents a measure of association between confidence and accuracy, and the gamma correlation is regarded as an appropriate measure for ordinal data containing tied scores (Nelson, 1984; Nelson & Narens, 1990; Wright, 1996). For each participant a 5 by 2 contingency table was created in which the number of questions that was accurately and inaccurately answered at confidence 5, 4, 3, 2 and 1 was entered. From this table a gamma score was computed. Central and peripheral detail gamma correlations were calculated for each participant when they remembered and knew the answers to the questions on the memory test. One sample t-tests, as recommended by Perfect and Hollins (1996), were then conducted to evaluate the significance of the mean confidence-accuracy gamma correlations in each experimental condition, from zero. It should be noted that the number of cases that comprised the CA gamma data cited in Table 2.6.2, varied from the number of cases, and the mean performance of participants, displayed in Table 2.6.1. In answering the experimental questions, various analyses were performed, and this led to a filtering out of participants.

A preliminary view of the data revealed weak to modest confidence-accuracy correlations across all conditions with higher CA correlations for remember-based retrieval. The mean confidence-accuracy correlations ranged from -0.08 to 0.55 across the experimental conditions. The overall mean ($M = .23$) was substantially lower than that reported in the literature. However, the mean CA gamma correlation for remembered central details was (.55) and this was consistent with the mean CA of (.54) reported by Perfect and Hollins (1996) after a 24 hour delay in testing, and a CA correlation of (.55) when memory was assessed 4 minutes after the simulated crime event was shown (Robinson et al., 1997). One of the strongest confidence-accuracy gamma correlations for eyewitness memory was (.64) obtained by Hollins and Perfect (1997) on a recall test with a mixed question format

and a 15 minute retention interval of the stimulus event.

Table 2.6.2: *Mean confidence-accuracy gamma correlation (and standard deviations) across state of awareness and detail for adult witnesses.*

	Central Details	Peripheral Details
'Know' judgements	-.08 (.16)	.28 (.15)
'Remember seeing' judgements	.55 (.09)*	.35 (.11)*

* $p < .05$, (2-tailed).

An ANOVA analysis reduces the number of valid cases so a Wilcoxon signed ranks, 2-tailed test was conducted to examine the effects of state of awareness and detail type to the strength of the CA correlation. The Wilcoxon test involves ranking all non-zero difference scores disregarding sign, re-assigning the sign to the ranks, and then evaluating the mean of the positive and negative ranks. This non-parametric means test was suitable because it facilitates the repeated measures design used in the study. Furthermore, it is particularly suited for evaluating tied scores involving ordinal data, which is present in the CA correlation, because medians are a more meaningful measure of central tendency than the means (Green, Salkind, & Akey, 2000).

The results of a Wilcoxon signed ranks test revealed a significant difference between 'remembering' and 'knowing' to the central detail CA correlation ($z = 2.37$, $p < .025$). The mean (and sum) of the ranks in which remembering facilitated the central detail CA correlation was 4.93 (34.50), while the mean (and sum) of the ranks in which a 'know' mental state improved the central detail CA correlation was 1.50 (1.50). There was no significant difference between 'remembering' and 'knowing' to the peripheral detail CA correlation ($z = 1.63$, $p > .05$). The mean (and sum) of the ranks in which remembering facilitated the peripheral detail CA correlation was 0.00 (.00), while the mean (and sum) of the ranks in which a 'know' mental state improved the central detail CA correlation was 2.00 (6.00). Figure 2.6.3 illustrates that remembering improved the magnitude of the CA correlation more than knowing, but this advantage was limited to the recall of central details, a partial confirmation of the experimental hypothesis.

When the effect of detail type was considered, no significant difference was observed between the central and peripheral detail CA correlations reported during a 'remember' state of awareness ($z = 1.24$, $p > .05$). The mean (and sum) of the ranks in which the central detail CA correlation was higher than the peripheral detail CA correlation was 13.80 (138.00), while the mean (and sum) of the ranks in which the peripheral detail CA correlation was higher than the central detail CA correlation was 7.20 (72.00). Similarly, there was no difference between the central and peripheral detail CA correlations reported during a 'know' state of awareness ($z = .28$, $p > .05$). The mean (and sum) of the ranks in which the central detail CA correlation was higher than the peripheral detail CA correlation was 5.92 (35.50), while the mean (and sum) of the ranks in which the peripheral detail CA correlation was higher than the central detail CA correlation was 7.08 (42.50).

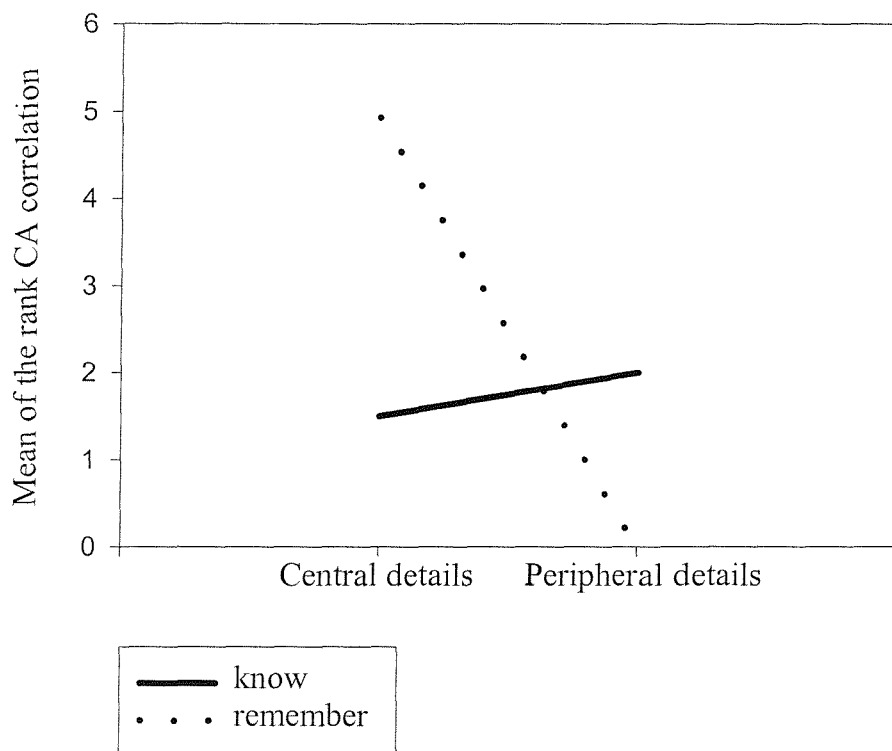


Figure 2.6.3: The effects of retrieval state and detail on the mean of the ranks CA correlation

Although figure 2.6.3 displayed the effects of retrieval state and detail type on the mean of the ranks CA correlation, it should be noted that in some of the Wilcoxon analyses there were fewer than 16 paired cases. This could reduce the validity of the results as only the most powerful differences could be expected to show up in the data. Hence the results obtained in this study need to be accepted with caution.

The relationship between states of awareness, detail and source accuracy

This series of analyses examines the complex relationship between state of awareness, source, and detail on eyewitness overall event accuracy. A hierarchical multiple regression analysis was conducted to answer the question, to what extent can eyewitness accuracy be predicted from witnesses' state of awareness at retrieval (Block 1), source accuracy (Block 2) and detail type (Block 3). Event accuracy, the criterion variable, was computed as the proportion of accurate responses from total responses, both accurate and inaccurate.

The relationship between a 'remember' retrieval state, the predictor variable, and event accuracy was assessed in the following way. For each participant the proportion of accurately remembered information, from all information remembered, was computed. Similarly, in order to estimate the relationship between a second predictor variable, the 'know' retrieval state, and event accuracy, the proportion of 'know' responses that was accurate, from all information 'known,' was calculated for each participant.

The results of Block 1 indicated that 'remember' and 'know' states of awareness together accounted for a significant amount of the accuracy variability $R^2 = .85$, $F(2, 106) = 302.20$, $p < .001$. Remember and know judgements not only reflect the overall rate of eyewitness responses, but people who give 'remember' and 'know' responses are more likely to be accurate than inaccurate. The standardized regression coefficient for the 'remember' state of awareness was (.69, $t = 17.95$, $p < .001$) and for the 'know' state it was (.50, $t = 13.12$, $p < .001$). Howell (1987) cautions against using the magnitude of a correlation coefficient to estimate the importance of one predictor variable over another. However, the importance of the beta coefficient may be estimated from the magnitude of the t and p -values (Green et al., 2000).

A second analysis was conducted to evaluate whether source accuracy predicted event accuracy over and above the state of awareness at retrieval. The proportion of source

accurate information was computed in relation to the total source information reported. This included central and peripheral details that were remembered and known. The results of Block 2 indicated that source accuracy did not contribute to the event accuracy variability after controlling for the effects of state of awareness, R^2 change = .001, $F(1, 105) = .61$, $p > .05$. The standardized regression coefficient was (.03, $t = .78$, $p > .05$).

A third analysis was conducted to examine whether detail type predicted event accuracy after controlling for the effects of state of awareness and source accuracy. Detail type included central details remembered and known, as well as peripheral details remembered and known. The results showed an R^2 change = .12, $F(2, 103) = 182.05$, $p < .05$. The standardized regression coefficient was (.41, $t = 14.56$, $p < .05$) for central details and (.54, $t = 17.47$, $p < .05$) for peripheral details. Together the five variables explained 97 percent of the accuracy variability, $R^2 = .97$, $F(5, 103) = 609.09$, $p < .001$. Table 2.6.4. summarises the B, standard error, beta values and the partial correlation of the predictors in each set of variables.

Table 2.6.4. Hierarchical multiple regression of predictors of accuracy

Blocks	B	Standard error	Beta	Partial correlations
Block 1:				
Remember	.55	.03	.69*	.87
Know	.34	.03	.50*	.79
Block 2:				
Source accuracy	.12	.15	.03	.08
Block 3:				
Central detail	.32	.02	.41*	.82
Peripheral detail	.44	.03	.54*	.87

* Significant at $p < .05$.

Three questions generated from the remember/know paradigm and the source monitoring framework, and relevant to eyewitness memory, were addressed using a linear regression analysis. To what extent is a 'remember' retrieval state a good predictor of (1) accuracy, and (2) source accuracy? The third question is, to what extent is source accuracy a

good predictor of event accuracy?

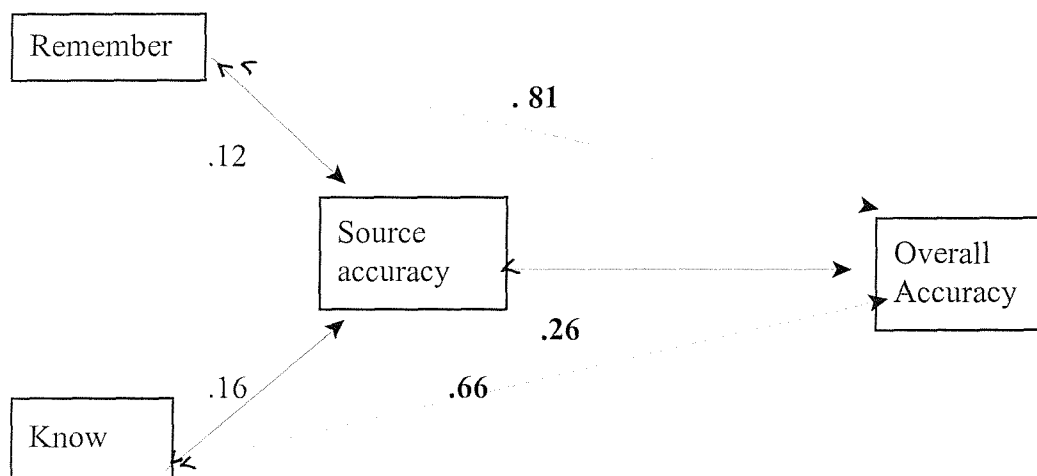
The results of a linear regression analysis to evaluate the prediction of accuracy from a 'remember' state of awareness at retrieval, revealed that the correlation between 'remembering' and accuracy was .81, $t(150) = 16.93$, $p < .001$. Approximately 66 percent of the variance of accuracy was accounted for by its linear relationship with a 'remember' retrieval state. In contrast, the correlation between a 'know' retrieval state and accuracy was .66, $t(119) = 9.65$, $p < .001$. Forty-four percent of the variance of accuracy was accounted for by its linear relationship with a 'know' retrieval state. In response to the first question, does a 'remember' state of awareness at retrieval facilitate eyewitness accuracy more than a 'know' retrieval state? The results of the ANOVA analysis previously discussed suggested that remembering was associated with a higher proportion of accurate responses than knowing. However, a clear-cut answer is not provided by the regression data. Some statisticians acknowledge that often independent variables in a regression analysis can be highly correlated with one another (e.g. Howell, 1987; Norusis, 1993). In this case, the data appear to indicate that people who make remember responses also give more know responses. The data reflect the theoretical view that a know retrieval state is activated during remembering (Knowlton, 1998). When the two correlations .81 and .66, were added the value was 1.47.

The second question was, to what extent is a 'remember' retrieval state a good predictor of source accuracy? The results of a linear regression analysis revealed that the correlation between 'remembering' and source accuracy was .12, $t(150) = 1.50$, $p > .05$. Approximately 2 percent of the variance of source accuracy was accounted for by its linear relationship with a 'remember' retrieval state. Similarly, the correlation between 'knowing' and source accuracy was .16, $t(119) = 1.74$, $p > .05$. Approximately 3 percent of the variance of source accuracy was accounted for by its linear relationship with a 'know' retrieval state. There was no evidence that the state of awareness at retrieval contributed significantly to source accuracy.

The third question was, to what extent is source accuracy a good predictor of event accuracy? A linear regression analysis revealed that the correlation between source accuracy and event accuracy was .26, $t(159) = 3.40$, $p < .025$, with 7 percent of the variance of accuracy being accounted for by its linear relationship with source accuracy. The finding

was consistent with one of the main predictions of the SMF that source identification helps in retrieving the associated details that are necessary to accurately report an experience (Johnson et al., 1993). Nevertheless, the results must be interpreted with caution because the relationship is small 7 percent. The path diagram displayed in Figure 2.6.5 was based on the standardized beta coefficients obtained in the series of linear analyses previously described. The diagram displays how retrieval state, memory for source and overall accuracy inter-relate.

Figure 2.6.5 Path coefficients between retrieval state, source and overall accuracy



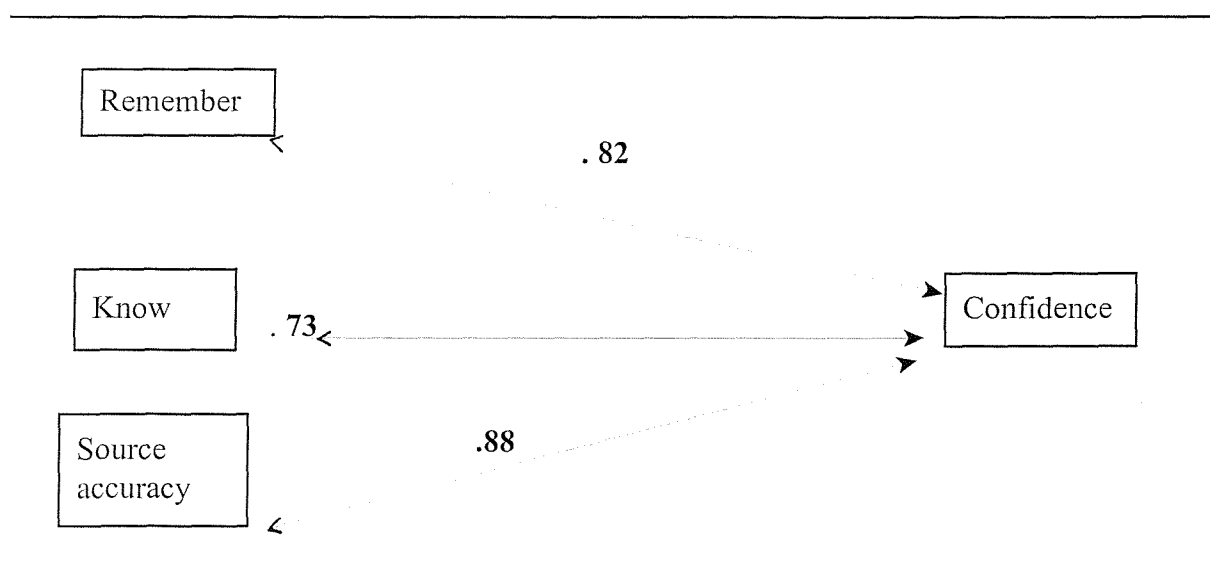
Coefficients in bold font are significant at $p < .05$

Participants estimated their confidence in the accuracy of their answers and this allowed the examination of two issues outlined in the source monitoring framework (SMF). First, a 'remember' retrieval state boosts confidence; and second, source-identification increases confidence in memory (Johnson et al., 1993; Johnson, 1997). The results of a linear regression analysis to evaluate the prediction of confidence from a 'remember' state of awareness at retrieval, revealed that the correlation between 'remembering' and confidence was $.82$, $t(146) = 17.06$, $p < .001$. Approximately 67 percent of the variance of confidence was accounted for by its linear relationship with a 'remember' retrieval state. The

correlation between a 'know' retrieval state and confidence was $.73$, $t(103) = 10.90$, $p < .001$. Fifty-four percent of the variance of confidence was accounted for by its linear relationship with a 'know' retrieval state. In response to the first question, a 'remember' state of awareness at retrieval initially appears to boost eyewitness confidence more than a 'know' retrieval state. The data were in line with the ANOVA data. However, when the correlations for remember and know were added they summed to 1.55 , and indication that both states of awareness contribute to eyewitness confidence. This suggests a high bi-directional or reciprocal relationship (Howitt & Cramer, 1997; Howitt & Cramer, 1999).

The second question was, to what extent is source accuracy a good predictor of confidence in memory. A linear regression analysis revealed that the correlation between source accuracy and confidence was $.88$, $t(156) = 22.78$, $p < .001$, with 77 percent of the variance of confidence being account for by its linear relationship with source accuracy. The path diagram displayed in Figure 2.6.6 was based on the standardized beta coefficients obtained in the series of linear analyses previously described. The diagram displays how retrieval state, memory for source and confidence inter-relate.

Figure 2.6.6 Path coefficients between retrieval state, source and confidence



Coefficients in bold font are significant at $p < .05$.

2.7. Discussion

The primary objective of this experiment was to determine the contribution of remember/know states of awareness to recall accuracy, confidence and the confidence-accuracy relationship. Recall was measured for the critical or central, and peripheral details of an eye-witnessed event. Given the predictions of the Source Monitoring Framework (SMF), requesting witnesses to provide source, confidence and a remember/know judgement was viewed as one way of assisting them to control the information they choose to report or withhold. Consequently, the result would be improvements to response accuracy and the confidence-accuracy association. The SMF emphasises the benefits of source accuracy to overall accuracy and the generalizability of this prediction towards facilitating eyewitness memory and confidence was examined. The present discussion is divided into three main areas; the influence of state of awareness at retrieval to the confidence-accuracy relationship; the relationship between states of awareness and source monitoring accuracy; and the implications and limitations of the results. The data obtained in this study were evaluated for the generalizability of the predictions identified in the SMF and the remember/know paradigm. More importantly, the data contributed to the general understanding of the retrieval or 'thought' processes underlying reliable confidence-accuracy judgements.

The relationship between mental states at retrieval and the CA association

The main finding was that the benefits of remembering initially identified with word-recall (Toplis, 1997; Tulving, 1985, Experiment 2) and autobiographical memory (Hyman et al., 1998) extend to eyewitness memory. The discussion highlights the contribution of mental states to the total number of questions answered as well as the number of correct details provided. The role of retrieval state and detail to recall accuracy, confidence in perceived accuracy, and the CA association are subsequently evaluated.

Recall accuracy

The ability to remember the information reported was associated with an increase in the number of questions answered and the total number of correct responses given. The consensus in the literature is that a 'remember' state of awareness is associated with greater recall accuracy than a 'know' state of awareness. The data presented in Table 2.6.1 revealed

a higher number of correct central and peripheral responses for information remembered than known. Interestingly, the number of incorrect central and peripheral detail answers were also significantly higher for remembered-based recollections than know-based ones. Tulving (1985) believed that remember/know states of awareness reflect different qualitative aspects of memories and that true and false eyewitness memories may be phenomenologically different. Hence, one would expect that a remember state of awareness always accompanies correct recall, while a know state of awareness accompanies incorrect recall. It appears that certain errors can result from the same cognitive processes that produce accurate memories (Multhaup et al., 1999).

Closer examination of the type of errors participants made when they inaccurately 'remembered' an incident revealed that, in general, individuals made source monitoring rather than intrusion errors. Participants' 'remember' responses often contained correct information for another portion of the eye-witnessed event. In this sense, memories can be accurate in that they refer abstractly to an experience, yet these recollections can contain details that arise from source monitoring errors rather than from experience (Clancy, Schacter, McNally & Pitman, 2000).

The most important result was that the *proportion of accurate responses* was significantly higher for all details remembered than known, a confirmation of the experimental hypothesis. The data highlighted one of the difficulties in interpreting the results of remember/know studies across experiments. Experiments report the hit rates and the mean number of correct responses (Tulving, 1985), the mean number of correct responses as well as the proportion of accurate responses (Perfect & Hollins, 1996; Hollins & Perfect, 1997), and d' which filters out participants' bias in responding 'yes' as opposed to correct responses (Wright et al., 2000). Different analyses produce different conclusions about recall accuracy (e.g. Hollins & Perfect, 1997).

Detail. Some experiments report that memory is better for the central details of an experience (e.g. Migueles & Garcia-Bajos, 1999) but there was no evidence of this in the study. Conversely, memory for peripheral details was better than memory for central details; specifically, the number of questions answered and the number of correct responses. This is an optimistic finding given that accurate peripheral details may contain an important clue that can assist police investigations. Furthermore, accurate recall of the minutiae of an event

increases the perceived credibility of a witness in the eyes of the jury (e.g. Heath et al., 1997).

The effect of detail type on memory depends on what aspect of memory is examined. Detail type had no significant effect on the proportion of accurate responses. Burke et al. (1992, Experiment 2) obtained the same results following an immediate memory test. The data were inconsistent with theories advocating the selective attention, encoding and retrieval of information (Easterbrook, 1959). The failure to find an effect of detail type on memory accuracy may be due to the possibility that the weak memory traces associated with peripheral details were activated when participants were remembering the central details. Tulving's remember/know model promotes the idea that a weak memory trace could be activated during a rich or optimal retrieval state. The descriptive 'remember' state of awareness given to participants in this experiment perhaps also functioned as a retrieval cue.

Confidence

Remembering not only improved accuracy but also expressions of confidence in the accuracy of those recollections. Higher confidence ratings were given for information 'remembered' than information 'known', and this result was consistent with the data from word recall (Toplis, 1997), memory for sentences (Holmes, Waters, & Rajaram, 1998) and autobiographical memory (Hyman et al., 1998). There was no effect of detail type on confidence as accurate central and peripheral details attracted equivalent confidence ratings. The self-reports of most of the participants reflected greater confidence for items remembered.

"If I could remember and picture the answer then I was confident." - female 17 years.

"If I had a clear picture in my head I knew it was right." - female 17 years

Participants' reports reinforced Tulving's description of remembering as autonoetic or self-knowing consciousness. Remembering is described as implicit source monitoring (Hyman et al., 1998) so it is not surprising that a 'remember' state of awareness boosted confidence in

memory. More importantly, accurate central and peripheral details were reported more confidently than inaccurate central and peripheral details, when the information was remembered rather than known. So the act of remembering assists participants to discriminate between correct and incorrect memories, an advantage that was outlined in the SMF by Johnson and colleagues (e.g. Johnson et al., 1993).

Participants in Experiment 1a reported details of the film-clip 24 hours after viewing the event. Memory fades with time (Warren & Lane, 1995) and less confidence was expressed in information that was familiar or known. Participants therefore relied on indicators, such as the type of stimulus material audio or video presented, response time and cognitive effort, to estimate their certainty in the reliability of their memories. Confidence was based on the following decisions.

"How long I had to think about the answer for." - female 17 years.

"More confident for information from the audio-cassette, not very confident for the video because it was quick, detailed and very short." - female 17 years.

"If I knew the answer straight away I was confident but not if I had to think about the answer a lot." - female 17 years.

These reports indicated that confidence is not solely determined by the mental state accompanying retrieval particularly if the ease of retrieval is mistaken for familiarity with the material (Kelley & Jacoby, 1998). Instead, other factors including the ease with which responses came to mind (Kelley & Lindsay, 1993) or the time it takes to give a response (Robinson, Johnson & Herndon, 1997), influence confidence.

The confidence-accuracy relationship

The mean confidence-accuracy correlation across the experimental conditions was substantially lower than some of the CA gamma correlations reported for eyewitness recall (e.g. Robinson & Johnson, 1996). The weak correlations obtained for central and peripheral details 'known' (Table 2.6.2) reflected Luus and Wells's (1994) 'confidence main-effect' problem. That is, knowing an answer, rather than remembering it, could boost confidence

without an attendant increase in accuracy.

The most important result of this study pertained to the relationship between a 'remember' mental state at retrieval in assisting witnesses to make strong and reliable CA judgements. The experimental prediction was for stronger CA relationships for remembered-based recollections; instead, the data indicated that the effectiveness of a remember state of awareness was moderated by detail type. Specifically, remembering improved CA processing more than knowing, but only for the critical, central details of the observed event. The results must be treated with caution because of the low number of participants in some conditions. Nevertheless, the results are relevant given the limited research in this area and further work is needed to ascertain the robustness of this finding. Evidence that mentally experiencing an event can facilitate the matching of confidence and accuracy judgements contrasts with other research in which introspective techniques that encouraged cognitive insight were detrimental to suspect identification (Robinson & Johnson, 1998).

The relationship between remember/know states of awareness and source monitoring

Although the relationships between states of awareness to source accuracy and confidence in memory were examined individually in the present study, theoretically the mental states underlying memory and source monitoring may share similar cognitive processes. This was discussed in Chapter One but of particular relevance from that discussion was the inter-relationship between remember/know, source and confidence judgements. Remember/know judgements may be viewed as implicit source judgements (Hyman et al., 1998) and these mental states determine expressions of confidence (Rajaram & Roediger, 1997). Mather et al., (1997) believe that a source judgement imposes a stricter test of memory than a remember/know judgement, so one would expect that source accuracy, rather than states of awareness, contributes most to overall accuracy.

In this study, a series of linear regression analyses measured the strength of the contribution from remember and know retrieval states respectively and from source accuracy to overall accuracy. The standardized beta coefficients revealed that remember and know retrieval states were significantly related to overall accuracy. Given that the data used in the

regression analysis was a measure of the performance of all participants, the data best suggest that participants who made remember judgements, perhaps also made more know judgements.

A remember state of awareness did not significantly improve source accuracy. The result may be explained by the nature of the memory test administered to participants. Recall memory imposes a stricter criterion when making a source judgement so it was more difficult for participants to recall the source of their memories, particularly after a 24 hour retention interval. Dodson and Johnson (1996) claimed that it is easier for participants to recollect source information on an immediate memory test. Delaying the test reduces the influence of conscious recollection but it does not affect general familiarity with the stimulus event. In the absence of a context, other types of information such as spatial, temporal and the salience of the details influence source judgements.

The results of the present experiment supported one of the main tenets of the SMF; that is, source accuracy improves event accuracy. There is often a bias in comparing the effect of source accuracy to overall memory across experiments, as source judgements vary in their difficulty according to the source modalities measured and the particular conditions surrounding the source-monitoring test. However, the established finding is that memory for the source of an event generally facilitates memory for the details of that event. For example, source cues reduce false word-recall by as much as 50 percent (Hicks & Marsh, 1999, Experiments 1 and 3). The results of the present study highlight the benefits of efficient source monitoring to eyewitness accuracy.

The strength of the relationships between remember and know states of awareness respectively to confidence in memory, as well as the link between source accuracy and confidence in memory were examined in a series of linear regression analyses. The standardized beta coefficients were significant for remember and know retrieval states. Once again as noted in the accuracy data previously discussed, participants who engaged in remembering were perhaps likely to make know judgements to some of their answers. The important finding was that memory for source was a good predictor of content-accuracy, and it was a strong determinant of confidence in performance.

One of the limitations of this experiment was the reduction by almost 50 percent of the number of participants tested and the number of cases available for analysis. One hundred and sixty-seven participants were tested but only 70 cases were available for ANOVA analysis which contained data in all the experimental conditions. The study highlighted the problem of the mutually exclusive assumption of Tulving's remember/know procedure. The number of 'know' responses decreases in relation to the increase in the number of 'remember' judgements. The number of cases is also reduced when a 'don't know' option is provided and some experiments modelled after the remember/know procedure encourage participants to give a response, guessing if necessary (Toplis, 1997). This option was not considered forensically relevant.

Conclusion

In summary, the results of Experiment 1a supported the experimental predictions; remembering facilitated recall accuracy, confidence and the confidence-accuracy relationship. The data obtained accorded with the theoretical literature but the main contribution of the study was the insight provided into how remembering facilitates confidence-accuracy resolution for eyewitness memory. An important result was the moderating effect of detail type on state of awareness in matching confidence and accuracy decisions. The SMF and Tulving's remember/know model emphasised the importance of the type and quality of the consciousness experience accompanying retrieval to response accuracy. The present experiment identified detail type as a moderating variable that limits the global effects of remembering to performance.

The next experiment examined the reliability of CA judgements for non-recollective but feeling of knowing (FOK) experiences. Although the data were collected in Experiment 1a, the results are discussed in Experiment 1b. FOK judgements are based on participants' belief that they are able to recognise information that they cannot initially recall. An association has been made between 'knowing' and 'feeling of knowing' (Gardiner & Parkin, 1990; Gardiner et al., 1998; Sykes, Gruneberg & Turner, 1988). Gardiner et al. reported that

participants in their experiment linked 'know' responses to a feeling of knowing and a sense of familiarity. Sykes et al. contended that the feeling of certainty for recall and recognition, retrospective memory, taps the same memory monitoring process as FOK's for prospective memory. Gardiner and Parkin (1990) proposed a more direct link between mental states and prospective recognition memory; in the absence of recollection there may be an unconscious feeling of knowing. Experiment 1b examined the role of detail type to FOK judgements. The study was exploratory because it investigated the link between states of awareness and predictive accuracy, as well mental states and the predictive CA relationship. The focus on the CA relationship for non-recollective but FOK predictions was consistent with the main theme of the thesis to examine the role of retrieval states in facilitating CA judgements.

CHAPTER THREE

Experiment 1b: Exploring the Relationship between States of Awareness and the Confidence-Accuracy Relationship for Feeling of Knowing Judgements

“When the task requires judgements of recognition, then quite unconscious forms of memory may give rise to the conscious experience of familiarity, or feeling of knowing - and hence judgements of recognition in the absence of conscious recollection.” (Gardiner & Parkin, 1990, p. 582).

Introduction

The remember/know procedure is traditionally used to evaluate retrieval success. However, the possibility that people can sometimes recollect attending to or encoding information, although they are unable to produce a response cannot be ignored (Donaldson, 1996). These Feeling of Knowing (FOK) judgements are based on peoples’ beliefs that they would be able to recognise information that they cannot spontaneously recall. A FOK reflects a belief in prospective or future memory, and the extent to which such predictions lead to successful retrieval is described as predictive accuracy. The reliability of prospective memory is examined in a variety of situations including memory for general knowledge and eyewitness information (Perfect & Hollins, 1996; Perfect & Hollins, 1999) as well as judgements of learning (Son & Metcalfe, 2000). Judgements of prospective memory for eye-witnessed information are less reliable than similar judgments for general knowledge events. Perfect and Hollins (1999) reported weak FOK-recognition correlations for eyewitness memory. The extent to which the FOK confidence-accuracy relationship is reliable remains unexplored and this is addressed in the present study. As such, the present experiment responds to the call for more research to determine whether eyewitness FOK always lack predictive power (Perfect & Hollins, 1999).

In Experiment 1a, the CA relationship was assessed for *retrospective* meta-memory because participants gave a confidence rating following recall. The results of that study revealed that participants were more confident when reporting accurate information they

remembered, evidence of efficient memory monitoring. A 'remember' state of awareness strengthened the CA association for central detail reports. These findings justified the examination of another form of memory monitoring, FOK judgements, and the reliability of these judgements. Feeling of knowing judgements allow the investigation of *predictive* meta-memory and this study continues to examine the main goals of the thesis which are the identification of the mental states at retrieval and the measurement of the strength of the FOK-CA association. Apart from these specific contributions to the FOK literature, the results of this study are important because there are currently few studies on eyewitness predictive accuracy.

3.1. Feeling of knowing (FOK)

Experiment 1b is modelled on the recall-judgement-recognition paradigm used to evaluate FOK performance (Hart, 1965). In this paradigm, participants are given a recall test. Then, unanswered questions are assessed for the likelihood of retrieval on a subsequent recognition test, a FOK judgement. Finally, the recognition test is administered. The recall data used in this study were derived from Experiment 1a. Participants were then given a recognition version of the recall test administered in Experiment 1a, to assess the accuracy of their FOK judgements. Recognised items were assigned a confidence rating which allowed the FOK-CA correlation to be computed. Tulving's remember/know procedure was used to evaluate the mental origins underlying predictive accuracy and the predictive confidence-accuracy association. Based on the results of Experiment 1a, it was expected that participants would be more accurate for items subsequently recognised during a 'remember' state of awareness, and that individuals would be better able to match their accuracy and confidence for answers they remembered.

Feelings of knowing (FOK's) are meta-cognitive since they are based on cognitive and affective processes (Koriat & Levy-Sadot, 1999). FOK's are based on inferences (Widner, Smith & Graziano, 1996) derived from the outcome of the search for the target information. The failure to retrieve information results in a feeling of not knowing, while the partial retrieval of information may trigger a 'feeling of knowing' (Koriat, 1993) or a 'feel of

memory' (Glenberg, 1997). A FOK is another state of awareness, in addition to the 'remember' and 'know' mental states described in Chapter 1. Feelings of knowing represent anomalies in metamemory because they indicate an awareness of memory without the content (Zalla & Palma, 1995). This intuitive awareness of memory shows that although retrieval may be blocked, memory monitoring remains intact. Given the importance of feeling of knowing judgements to meta-memory processing it is important to identify how FOK's arise.

There is both practical and theoretical interest in identifying the factors that determine future memory performance. The failure to access information can nevertheless trigger a strong impression that the information is known and that it could be retrieved with a hint, and this applies to eyewitness memory (Perfect & Hollins, 1996). Feeling of knowing intuitions decide whether the search for additional information, that is initially unavailable, will continue or will be aborted. For example, a witness who is unable to provide an adequate description of a suspect may nevertheless have a strong feeling that he or she would recognise the suspect from a photograph or a lineup of suspects.

From a theoretical perspective successful feeling of knowing, recognition responses prove that recognition is superior to recall and that retention exceeds retrieval (Hart, 1965; Koriat, 1998; Nelson & Narens, 1980). The remember/know procedure has been extensively used to explain information retrieval and the accuracy of responses. However, the remember/know paradigm has not considered the possibility that initial non-recollective experiences, may have an underlying familiarity or contextual basis in their FOK judgments. Some theorists suggest that feelings of knowing are akin to a sense of familiarity (Lories, Dardenne & Yzerbyt, 1998), thus FOK's appear to be closely linked to the 'know' state of awareness identified by Tulving (1983; 1985). However, FOK's may also have a contextual basis (Koriat & Levy-Sadot, 1999), so the relationship between states of awareness and feeling of knowing predictive accuracy as well as confidence in recognition memory merit further investigation.

There are several explanations for the origin of feelings of knowing judgements. The first is a trace-based view which assumes the existence of an *internal monitor* (Hart, 1965;

Nelson, Gerler & Narens, 1984). Within this model retrieval is based on a two-phase process in which a query triggers an initial search by the internal monitor to determine if the desired information is stored in memory. The second phase involves retrieval of the details associated with the query. However, the two phases are assumed to be independent and feeling of knowing judgements reflect memory monitoring only during the first phase. The factors that prompt FOK judgments may not be responsible for FOK predictive accuracy. In one study more feeling of knowing judgements were made for difficult test items not initially recalled, but subsequent recognition performance revealed no effect of item difficulty on FOK accuracy (Widner & Smith, 1996). The 'internal monitor' explanation indicates that a FOK mental state is more common than it is generally thought to be. In fact, it is assumed that FOK's occur implicitly in everyday situations whenever a question is asked (Nouvyanisvong & Reder, 1998; Reder & Ritter, 1992).

According to the 'cue familiarity' hypothesis memory searches occur on the basis of the familiarity of cues present in the question or how much people think they know about a specific domain of knowledge. FOK judgements are assumed to be an accurate gauge of the contents of memory because more familiar items tend to be associated with targets stored in memory (Metcalf, Schwartz & Joaquim, 1993). Metcalfe et al. reported four experiments in support of this hypothesis but when cue familiarity was encouraged by repeating items, a reduction in FOK judgements, rather than the expected increase occurred (Florer & Allen, 2000, Experiment 1). Perhaps this reduction in FOK judgements arose because cue familiarity encouraged more items to be overtly recalled, so cue familiarity may not be the only explanation for FOK judgements.

FOK decisions are assumed to be driven by the accessibility or the ease with which the retrieval process can search for either the target material or related fragments of information (Koriat, 1993; 1995). The partial retrieval of information may be correct or incorrect but it establishes FOK judgements. The accessibility hypothesis emphasises the interaction between memory monitoring and retrieval, and accessibility is judged on the basis of the retrieval cues located in the target question (Leibert & Nelson, 1998), as well as the specificity (e.g. degree of detail) and vividness of these cues (Koriat, 1993).

In order to explain ‘how people know what they know’ Koriat and Levy-Sadot (1999) proposed a dual-process framework. This framework emphasised an inferential, rather than a trace-based process in meta-cognitive monitoring. The theorists differentiated between *meta-cognitive feelings*, based on subjective and affective states of awareness accompanying ‘feelings of knowing’, and *meta-cognitive judgements* which are cognitive in nature and based on partial information. Meta-cognitive monitoring is based on affective hunches and information.

The dual-process framework draws a link between Tulving’s remember/know states of awareness and FOK judgements. Koriat and Levy-Sadot argue that some types of FOK experiences may possess a phenomenological, conscious awareness of information. This prompts the belief that the target knowledge, which may be partially retrieved, is stored in memory. Such an ‘awareness’ parallels the ‘remember’ component described in the remember/know paradigm (Tulving, 1985; Gardiner & Java, 1993). This type of FOK experience appears closely related to the tip of the tongue (TOT) experience which may have a visual component. Koriat and Levy-Sadot identified a second type of FOK judgement which is accompanied by a general familiarity with the target item, similar to the ‘know’ state of awareness outlined in Tulving’s paradigm. This sense of familiarity triggers an ‘intuitive’ sense of knowledge or a ‘hunch’ that the information required may be available. The dual-process framework develops the earlier ideas of Zalla and Palma (1995) who also claimed that the FOK state is one in which information is processed from both affective cues and contextual knowledge.

FOK judgements are determined by the knowledge participants have of the criterion test (Maki & Berry, 1984), the cognitive difficulty of the test items (Hart, 1965; Widner & Smith, 1996), domains of knowledge and insights into performance (Perfect & Hollins, 1996), and perceived expertise in specific domains of knowledge (Huet & Marquie, 1999; Peynircioglu & Tekcan, 2000). Reliable FOK-recognition gammas have been reported for general knowledge information (Perfect & Hollins, 1996) and for words (Peynircioglu & Tekcan, 2000). Weak FOK-recognition gammas exist for eyewitness memory (Perfect & Hollins, 1996; Perfect & Hollins, 1999, Experiments 1, 2).

The accuracy of FOK judgements has been evaluated using general knowledge questions (Hart, 1965; Perfect & Hollins, 1996; Widner Jr. et al, 1996; Widner Jr. & Smith, 1996), words lists (Koriat, 1993; Leibert & Nelson, 1998; Peynircioglu & Tekcan, 2000) and memory for letters and digits (Florer & Allen, 2000). Fewer studies assess the predictive feeling of knowing judgements for eyewitness memory. The exception is a study by Perfect and Hollins (1996) who reported that the proportion of FOK accuracy for eyewitness memory following a 24 retention interval was (.31) compared with FOK accuracy for general knowledge questions (.34). Better performance for general knowledge information may occur because items committed to memory are more likely to give rise to correct than incorrect recall (Koriat, 1993). In contrast, eyewitness memory may sometimes be the product of incidental, than deliberate learning.

Although the degree of difficulty of the test items was matched for general knowledge and eyewitness memory, Perfect and Hollins did not consider that within eyewitness memory some facts may be more memorable or salient than others and this may influence feeling of knowing predictions. Additionally, during the recognition phase of the experiment, participants were encouraged to provide an answer, guessing if necessary. In reality witnesses are discouraged from guessing and are asked to state if they do not know the answer to a question. Participants in the Perfect and Hollins study did not give a confidence rating in their recognition responses. These limitations were redressed in the present experiment.

Perfect and Hollins computed a FOK-recognition gamma to establish the reliability of FOK predictive accuracy and they reported that the gamma was more reliable for general knowledge events (.37) than eyewitness memory (.10). Perfect and Hollins (1999, Experiment 1) replicated their 1996 study. Undergraduates were shown 3 crime scenarios each lasting between 40 to 120 seconds. Twenty-four hours later participants completed a recall test or gave a confidence rating in their FOK knowledge and attempted a recognition test. The data patterned those obtained in the 1996 study. Recognition accuracy was low but significantly above chance while the FOK-recognition gamma was weak (.08). Perfect and Hollins reported that when participants were encouraged not to guess on the recall test, the

reliability of FOK predictions improved (Experiment 2).

The value of measuring FOK judgements when initial retrieval fails resides in the activation of partial clues or fragments of the target's semantic and episodic features (Koriat & Levy-Sadot, 2001). Some theorists disagree and suggest that in a test-retest design little may be gained. Fritz, Morris, Bjork, Gelman and Wickens (2000) found that even a second presentation of text material to individuals was unable to assist their recovery of new information, or the correction of errors made in initial recall, when a second memory test was administered. Anderson (1995) offers two reasons why a second memory test may have limited utility. First, with retrieval practice each time a memory trace is used, it increases in strength. Trace strength determines the information that will be activated on a future test and subsequent activation may be confined to details already known. Second, retrieval practice can also cause retrieval-induced forgetting. For instance, if a particular item of information cannot be recalled but related facts are retrieved, this impairs recovery of the original target item.

Despite the limitations outlined in the preceding paragraph, the forensic importance of facilitating eyewitness memory by providing a second chance for recovering material is worth the risk of evaluating FOK knowledge. The present study responded to the general criticism that previous FOK research focussed on measuring the accuracy of feeling of knowing judgements without explaining or identifying the cognitive conditions that encourage such judgements (Koriat, 1993). This study was exploratory and it examined the mental state of awareness underlying feeling of knowing confidence-accuracy judgements. Although the accessibility hypothesis identifies retrieval ease as a factor that promotes FOK judgments and the accuracy of these predictions, the nature of 'retrieval ease' is inconsistently defined in the literature (Florer & Allen, 2000). It was hoped that the data obtained in this experiment would provide some insight into the role of mental states of awareness to information accessibility. The predictions of this experiment related to the remember/know paradigm (Tulving, 1983; 1985) and the accessibility hypothesis (Koriat, 1993). It was expected that a re-experiencing of events, based on the contextual cues provided by the alternative answers present in the recognition test, would improve

recognition accuracy and the FOK confidence-accuracy relationship. Thus more accurate recognition answers and reliable FOK-CA judgements would accompany a 'remember' than a 'know' state of awareness at retrieval.

3.2. Method

Design

This study was part of Experiment 1a, rather than a separate study. Consequently, the data for this study was collected at the same time as the data obtained in Experiment 1a.

Participants

In light of the explanation outlined in the design, the participants were the same as those in Experiment 1a. They retained the same group to which they were randomly assigned on the basis of information type and presentation order, to the four groups described in Experiment 1a.

Materials

The stimulus material was identical to that used in Experiment 1a.

Questionnaire

Participants in Experiment 1a were given a cued-free recall test. If no answer was given for the test questions, participants were asked to indicate if this was because they did not know the answer or if they felt they could recognise the answer if they saw it, a feeling of knowing judgement. The accuracy of these feeling of knowing predictions was evaluated using a four alternative-forced-choiced recognition version of the recall test. Consequently, for each question on the recall test, four alternative answers were generated, one of which was the correct answer. The position of the correct answer varied among the alternative answers on the list. Participants were instructed to circle one of the four options on the list or the don't know option. The instructions for the recognition test were written on the questionnaire and they were identical to those used in Experiment 1a with the exception that participants were

not required to make a feeling of knowing prediction.

The instructions were as follows:

“When you answered the question, if you remembered SEEING or HEARING in your mind the information you needed to answer the question, then you REMEMBER the answer. If instead you simply had a feeling that ‘I just know’ the answer because it was familiar to me, then you KNOW the answer. Remembering is accompanied by a mental image or other auditory details, but knowing is not. Please don’t guess and try to be as accurate as possible. If you cannot answer the question, I want you to tell me if this was because you did not know the answer.”

Procedure

Immediately after completing the cued-recall test (Experiment 1a) participants were given the recognition test. Participants circled an answer or the don’t know option. For each item on the recognition test that was answered participants made three subsequent judgements. (1) A rating of confidence was measured on a 5-point Likert scale (where 1 = not very confident, and 5 = very confident), (2) the source of their answer, video or audiotape, and (3) a remember/know judgement. The order of the confidence, source and remember/know judgements was varied using a Latin Square. Participants were told not to discuss the task with one another and their performance was monitored by the researcher. The memory test was completed within 40 minutes.

Predictions

A ‘remember’ state of awareness in Experiment 1a increased the reliability of CA judgements for central details more than a ‘know’ state of awareness. Thus, it was expected that another form of memory monitoring, FOK judgements, would favour central detail information. Remembering boosted confidence in recall memory in Experiment 1a, and a similar prediction was made for confidence in recognition memory and FOK-CA judgements in the present study.

3.3 Results

Feeling of knowing predictions

For each item on the recognition test responses were classified as accurate, inaccurate or don't know. However, the accuracy of responses on the recognition test was evaluated only for the questions not answered on the recall test but for which a feeling of knowing judgement was made. The responses pertaining to the video event were analysed. The analysis focussed on two main issues (1) the effect of detail type on the proportion of 'feeling of knowing' judgements, and (2) the effect of state of awareness and detail type on the proportion of accurate FOK responses, confidence in recognition accuracy, and FOK-CA reliability. The proportion of FOK responses, proportion of FOK accuracy, and confidence in recognition memory are summarised in Table 3.3.1.

The Proportion of Feeling of Knowing Judgements

The FOK data were collapsed across participants, rather than within participants, for analysis. Although this has its statistical limitation, the decision to collapse the data across participants was based on the fact there were few cases in which a respondent who gave a FOK, subsequently provided an answer to the question. The proportion of FOK judgements was computed from the number of FOK judgements in relation to the number of unanswered questions (FOK plus Don't know responses). This followed the same pattern as Experiment 1a, in which the proportion of accurate responses was calculated in relation to the number of responses (correct plus incorrect). The mean proportion of FOK responses and (standard deviation scores) for central and peripheral details were 0.19 (.11) and 0.17 (.12) respectively. The results of a two-tailed, paired-samples t-test revealed that unanswered central and peripheral detail questions generated an equivalent proportion of FOK judgements ($t(136) = .14, p > .05$).

Table 3.3.1: *Proportion of feeling of knowing (FOK) responses, confidence when accurate and inaccurate across state of awareness and detail type (and standard deviations).*

	Central Details		Peripheral Details	
	Know	Remember	Know	Remember
Proportion Accurate FOK	.65 (.11)	.48 (.11)	.40 (.08)	.54 (.04)
Confidence Accurate FOKs	2.96(.19)	3.40 (.05)	2.75(.28)	3.32 (.10)
Confidence Inaccurate FOKs	2.43 (.14)	2.83 (.17)	2.59 (.19)	2.74 (.12)

Proportion of Feeling of Knowing Accuracy

The proportion of FOK accuracy was calculated from the correct recognition answers/the correct and incorrect recognition answers given in this study, in response to the FOK judgements given in Experiment 1a. Predictive accuracy ranged from .40 to .65 across the experimental conditions ($M = .52$) and this was above chance performance (.25). The number of valid cases in each experimental condition was as follows; central details 'remembered' ($n=27$), central details 'known' ($n=16$), peripheral details 'remembered' ($n=17$) and peripheral details 'known' ($n=16$). As a result of the small sample size in each experimental condition, a Wilcoxon signed ranks, 2 tailed test was used to examine the effects of state of awareness at retrieval and detail type to FOK accuracy.

The results revealed a significant difference between 'remembering' and 'knowing' to FOK accuracy for central details ($z = 2.07$, $p < .05$). The mean (and sum) of the ranks in which 'remembering' accompanied FOK accuracy was 0.00 (.00) and the mean of the ranks in which a 'know' state of awareness was associated with FOK accuracy was 3.00 (15.00). The data revealed that accurate FOK responses were accompanied by a 'know' state of awareness at retrieval. However, given the lack of data in some of the experimental conditions, the results must be treated with caution. Given the current paucity of data in this area, further research is needed. There were insufficient cases to assess the effect of state of awareness to peripheral detail FOK accuracy.

When the effect of detail type to FOK accuracy was examined, the results of the

Wilcoxon signed ranks test revealed no significant difference between central and peripheral detail FOK accuracy during a 'remember' retrieval state ($z = .06$, $p > .05$). The mean (and sum) of the ranks in which central detail FOK accuracy was higher was 4.60 (23.00) while the mean of the ranks in which peripheral detail FOK accuracy was higher was 5.50 (22.00). Similarly, there was no significant difference between central and peripheral detail FOK accuracy during a 'know' retrieval state ($z = 1.73$, $p > .05$). The mean of the ranks in which central detail FOK accuracy was higher was 2.00 (6.00) while the mean of the ranks in which peripheral detail FOK accuracy was higher was 0.00 (.00).

Confidence in Accurate Feeling of Knowing Responses

The number of valid cases across the experimental conditions was as follows; central details 'remembered' ($n=15$), central details 'known' ($n=12$), peripheral details 'remembered' ($n=11$) and peripheral details 'known' ($n=8$). The mean confidence for FOK accurate responses and (standard deviation) across state of awareness and detail were reported in Table 3.3.1. A Wilcoxon signed ranks test was used to examine the effect of state of awareness accompanying retrieval to confidence in FOK accuracy. There was no significant difference between 'remembering' and 'knowing' to confidence in FOK accuracy for central details ($z = 1.34$, $p < .05$). The mean (and sum) of the ranks in which 'remembering' accompanied confidence in central detail FOK accuracy was 1.50 (3.00) and the mean of the ranks in which a 'know' state of awareness was associated with confidence in central detail FOK accuracy was 0.00 (.00). There were insufficient cases to assess the effect of state of awareness to confidence in peripheral detail FOK accuracy.

The effect of detail type to confidence in FOK accuracy was examined with a Wilcoxon signed ranks test. There was no significant difference between confidence in central and peripheral detail FOK accuracy during a 'remember' retrieval state ($z = .45$, $p > .05$). The mean (and sum) of the ranks in which confidence in central detail FOK accuracy was higher was 1.00 (1.00) while the mean of the ranks in which confidence in peripheral detail FOK accuracy was higher was 2.00 (2.00). Similarly, there was no significant difference between confidence in central and peripheral detail FOK accuracy during a

'know' retrieval state ($z = .01$, $p > .05$). The mean of the ranks in which confidence in central detail FOK accuracy was higher was 1.50 (3.00) while the mean of the ranks in which peripheral detail FOK accuracy was higher was 3.00 (3.00).

FOK-Confidence-Accuracy Association

Gamma correlations are an appropriate measure of association for FOK research (Wright, 1996), so the FOK-CA gamma correlation was computed for each individual using the participant's recognition responses and confidence in performance. Experiment 1b suffered from the same limitation identified in Experiment 1a. The number of 'know' responses declines with an increase in the number of 'remember' responses and there were insufficient cases to use a Wilcoxon signed ranks test. This limitation was addressed in Part Two of the thesis by manipulating state of awareness as a between-subjects variable and then examining the effects of state of awareness instruction and detail type to the FOK-CA relationship. The correlations ranged from .08 to .72 ($M = .41$). A one sample t-test of the means was computed to assess significant correlations, and the CA correlation for peripheral details 'known' was significant. Table 3.3.2 summarizes the mean CA correlations across state of awareness and detail.

Table 3.3.2 *Mean FOK-CA gamma correlations (and standard deviations) across state of awareness and detail type for adult witnesses.*

	Central Details	Peripheral Details
'Know' judgements	.38 (.09)	.72(.14)*
'Remember' judgements	.45 (.13)	.08 (.05)

$p < .05$, 2-tailed.

3.4. Discussion

The results of this experiment are related to the questions addressed in the thesis regarding the contribution of states of awareness at retrieval to response accuracy and the confidence-accuracy (CA) association. The study was exploratory because the aforementioned issues

were examined for predictive FOK eyewitness memories. The novelty of the study was the investigation of the mental state of awareness accompanying FOK predictive accuracy and the FOK-CA association. The effect of detail type on FOK judgements and the subsequent predictive accuracy were also evaluated.

FOK judgements

Participants gave an equivalent proportion of FOK judgements to unanswered central and peripheral detail questions. This was surprising as Koriat (1993) claimed that FOK judgements may be related to memory strength. If central detail memory is better, and this leads to more answered central detail questions than peripheral detail ones, this should lead to an increase in FOK judgements for unanswered peripheral detail questions. However, there was no effect of detail type on the proportion of accurate responses recalled in Experiment 1a, and this may perhaps explain why there was no effect of detail type on the proportion of FOK judgements in this study.

States of awareness and proportion of FOK accuracy

The mean proportion of FOK accuracy across all test conditions ($M = .52$), was higher than the mean of (.31) reported by Perfect and Hollins (1996) when eyewitness memory was evaluated after a 24 hour delay. In the study by Perfect & Hollins chance performance was (.25) so participants in their study did not appear to perform above chance level. Chance performance in the present experiment was also (.25), so the data showed that eyewitness predictive accuracy can be reliable. The data were inconsistent with claims that feeling of knowing judgements do not predict subsequent recognition performance for eyewitness memory (Perfect & Hollins, 1999).

FOK predictive accuracy demonstrates that memory monitoring continues in the absence of spontaneous retrieval (Zalla & Palma, 1995), and that memory monitoring is efficient. The results contributed to the FOK literature by revealing the mental state of awareness that accompanied accurate FOK recognition, for eyewitness memory. A 'know' state of awareness at retrieval accompanied more accurate central detail recognition

responses, than a 'remember' retrieval state. The results are relevant on two accounts. First, some FOK experiences have been linked to Tulving's 'know' state of awareness or a sense of familiarity that knowledge, or partial information, is available (Koriat & Levy-Sadot, 1999; Lories et al., 1998). This familiarity with the context may be based on the cues present in the target question (Reder, 1987). Consequently, a 'feeling of 'knowing' an initially unanswered question, can lead to eventually 'knowing' the answer, rather than 'remembering' it. This finding was consistent with the trace-based view of FOK accuracy (Hart, 1965; Nelson et al., 1984), the accessibility hypothesis (Koriat, 1993), and the dual-process framework (Koriat & Levy-Sadot, 1999). The familiarity of cues or how much people think they know about a domain of knowledge determines FOK predictive accuracy.

Perfect and Hollins (1999) argue that the cue familiarity heuristic requires that the familiarity of a cue be a useful predictor of the ability to select the appropriate response on a recognition test. These authors stated that it is difficult to establish cue-familiarity on a single-trial eyewitness memory test. This difficulty is perhaps partially due to the varying definitions of 'familiarity' in the FOK literature. Reder (1987), for example, linked 'familiarity' to the recency of exposure to the target knowledge and the number of intersections in memory triggered by related episodic information. By using the definition of familiarity contained in the remember/know procedure; that is, familiarity is knowledge acquired in the absence of recollection, the data from Experiment 1b revealed that eyewitness predictive accuracy is driven more by knowledge of familiar central detail events, than a conscious awareness of such events that would characterise the 'remember' retrieval state. It is possible that there were stronger memory traces for the critical, salient details of the eye-witnessed event and that the partial knowledge participants knew existed in their memory was supplemented by the contextual cues provided by the alternative answers on the recognition test.

Second, identifying the mental state accompanying accurate recognition is important because the accuracy of FOK recognition memory has been attributed to guessing or the elimination of distractors, rather than actual memory for the event (Nelson et al., 1984). Participants may make a FOK judgement, not because they have a genuine FOK experience,

but because of a reluctance to admit a lack of knowledge (Widner, Smith & Graziano, 1996). Such FOK judgements reflect what a participant feels he or she is expected to know, rather than what this person actually knows (Costermans, Lories & Ansay, 1992). The remember/know procedure used in the present study demonstrated that knowledge of the witnessed event assisted recognition.

The FOK confidence-accuracy relationship

There was no effect of either state of awareness or detail type to confidence levels when participants accurately recognised items they could not initially recall. Perfect and Hollins (1999) reported that witnesses were more confident when they recognised items that came quickly or vividly to mind, or when such items were accompanied by contextual details. However, there was no evidence of this in the present study. The mean FOK-CA correlation (.41) was higher than the FOK-recognition correlation of (.10) reported by Perfect and Hollins (1996), and of (.08) obtained by Perfect and Hollins (1999, Experiment 1), when eyewitness memory was evaluated after a 24 hour delay. There were insufficient cases to assess the effects of retrieval state and detail to the magnitude of the FOK-CA correlation. However, the FOK-CA correlation for peripheral details 'known' was statistically significant. This finding is important because it is an indication that 'knowing' or familiarity with knowledge not only triggers FOK judgements (Lories et al., 1998), but it leads to accurate responses and higher confidence in accurate than inaccurate responses.

3.5.Conclusion

Some of the data were derived from low sample sizes and the study needs to be replicated with a larger number of participants before any tentative statement can be made regarding the role of retrieval state and detail to FOK accuracy, confidence and the FOK-CA association. The reduced number of valid cases available for analysis was due to the mutually exclusive nature of the remember/know procedure. This limitation is addressed in Part Two of the thesis in which the state of awareness at retrieval is manipulated as a

between-subjects variable via the pre-test instruction administered to witnesses. Despite these limitations, the data provided an insight into the memory monitoring that underlies FOK decisions, with respect to eyewitness memory.

Participants were able to recognise information they could not initially recall. This suggests that the lack of retrieval may often be due to having accessibility problems, rather than 'missing' information. The data confirmed that retention exceeds recall (Hart, 1965) and that recognition memory is superior to recall. The contextual cues present in the alternative answers on the recognition test appeared to facilitate memory that was initially unavailable. The important finding was that FOK predictive accuracy, for central details, was accompanied by a 'know', than a 'remember' retrieval state. One type of prospective memory that may be based on 'remembering' is the tip-of-the-tongue (TOT) experience.

TOT's are prompted by a partial image or source in mind, even though the information is initially inaccessible (Stevenage et al., submitted). When naming faces, for example, the TOT state is often accompanied by the retrieval of semantic and appearance-based information about the person, and even fragments of their name (Brennen, Baguley, Bright & Bruce, 1990). TOT experiences trigger material related to a target, and picture and well as definition cues prompt TOT's (Brown & Nix, 1996). TOT's differ from FOKs in two ways; first, TOT's occur automatically but FOK judgements are requested by the experimenter. Second, TOT's are more confidently expressed than FOK experiences, because the former is based on partial information while the latter reflects a *likelihood* of recognition (Brown, 1991). Evidence that memory is supplemented by the cues on a recognition test formed the basis of Experiment 1c. This study investigated the relationship between mental states at retrieval and recognition accuracy, confidence and the CA association.

CHAPTER FOUR

Experiment 1c: The Relationship between States of Awareness, Confidence-Accuracy Judgements and Source Monitoring Accuracy following Delayed Recognition

“Recognition memory may be based at times on a simple assessment of familiarity and at other times on the retrieval of a structured set of associated information that includes the source of the memory.” (McElree, Dolan & Jacoby, 1999)

4.1 Introduction

This study is an extension of Experiment 1a, and the research assesses the robustness of the results obtained for recall memory (Experiment 1a) under recognition conditions.

Recognition is judged to be an easier task than recall because it involves less cognitive effort (Robinson & Johnson, 1996). Robinson and Johnson compared eyewitness memory across recall and recognition tests and they reported that accuracy and confidence were higher for recognition than recall, but the CA correlation was higher for recall ($r = .58$) than recognition ($r = .49$). The difference in performance is attributed to the fact that recognition accuracy may hinge less on the ability to be consciously aware of events, but more on a sense of familiarity with information. Recall requires extensive reinstatement of an event, but recognition memory benefits both from a conscious awareness of events, as well as familiarity and perceptual fluency (Haist et al., 1992; Jacoby & Dallas, 1981; Mandler, 1980; McElree et al., 1999).

Mandler (1980) describes a dual-process theory in which recognition is based on both familiarity and recollection, so that recall and recognition retrieval processes are identical. The SAM model (Gillund & Shiffrin, 1984; Raaijmakers & Shiffrin, 1992) assumes that successful recall and recognition are both context dependent; however, recognition does not necessarily involve the sequential sampling of information that is necessary for recall. Instead, recognition is primarily based on a direct-access, single retrieval process based on familiarity. The alternative answers on a recognition test may function as memory probes and they appear to facilitate this single retrieval process.

Other theorists agree that the effect of test format, recall versus recognition, can determine the weight assigned to specific types of memorial experiences (Multhaup et al., 1999). This belief was perhaps based on earlier evidence by Tulving (1985) who reported a decline in the number of 'remember' judgements and an increase in 'know' judgements, across tests when a cued-recall task was followed by a recognition one. A similar trend was observed in the data obtained in Experiments 1a and 1b. Participants in Experiment 1a were more accurate and confident when they 'remembered' than 'knew' answers. Remembering also facilitated CA resolution, but only for central details. The data from Experiment 1b revealed that FOK recognition accuracy was higher for central details 'known' than 'remembered'. Despite these differences in recall and recognition performance, there is a body of evidence that a 'remember' retrieval state leads to improvements in recognition accuracy and confidence (Donaldson, 1996; Tulving, 1985, Experiment 2; Wagner, Gabrieli & Verfaellie, 1997, Experiment 4). These findings were based on memory for words, so the aim of this study was to examine the influence a 'remember' retrieval state would have on eyewitness accuracy, confidence and CA resolution.

Tulving (1985, Experiment 2) examined undergraduates' recognition memory immediately after presentation of the stimulus material. Recognition accuracy was 86 percent with 83 percent of the correct answers being classified as 'remembered' responses. Accuracy and judgements of recollection were reduced as retention interval increased. After 1 week the number of accurate responses decreased to 62 percent, with 55 percent of these items judged as words remembered. One result that causes concern for eyewitness memory is that 40 percent of the false-alarms in Tulving's experiment were classified as material 'remembered'. Although Tulving's experiment was based on 10 participants his findings are confirmed by similar experiments modelled after the remember/know procedure and based on an immediate recognition test of words (Donaldson, 1996; Java et al., 1998; Perfect, Mayes, Downes & Van Eijk, 1996; Wagner et al., 1997, Experiment 4).

Donaldson (1996) found that the remember 'hit-rate', or accuracy, was substantially larger than the know 'hit-rate'. A converse effect was obtained for the false-alarm rates; words classified as 'known' were associated with more false-alarms. Wagner et al. (1997,

Experiment 4) examined the effect of picture-word study on word recognition, and they reported similar results to Donaldson (1996). Finally, Java et al. (1998, Experiment 1) reported that an immediate word recognition test resulted in 83 percent correct responses. 'Remember' and 'know' judgements were responsible for 65 and 18 percent respectively of these correct responses. Since a 'remember' retrieval state improves accuracy and confidence, it should facilitate reliable CA judgements.

Some studies challenge the benefits of remembering to recognition accuracy (Holmes, Waters & Rajaram, 1998; Mather et al., 1997; Poldrack & Logan, 1997). The accurate recognition of words and non-words was found to have a large familiarity component that overshadowed the recollection component (Poldrack & Logan, 1997). True and false recognition can be equally classified as remembered information, and 'remembered' false- alarms occurred during an immediate recognition test of sentences (Holmes et al., 1998). Mather et al. (1997) investigated the link between recognition accuracy for items on a word-list and the false recognition of lures. Participants were tested immediately after the stimulus material was presented and they made a remember/know judgement for the retrieved information. The researchers reported that there was no significant difference in the proportions of 'remember' and 'know' responses to the studied items on the recognition test. Of particular concern for eyewitness memory is that suggested information can easily be reported as information 'remembered' (Wright & Stroud, 1998). Overall, it appears that the evidence pertaining to recollective-based recognition performance varies according to the stimulus material utilised, the task demands, and the delay in testing. Illusions that are judged to be 'remembered' are more common after a delay (Mazzoni & Loftus, 1996; Mazzoni, Vannucci & Loftus, 1999; Payne et al., 1996; Seamon, Luo, Schlegel, Greene & Goldenberg, 2000), although they can occur on an immediate test (Holmes et al., 1998).

4.2. Recognition memory and source monitoring

Mandler's (1980) dual-process theory claimed that recognition memory is based on the ability to retrieve a sequence of information preceding and following some target material. This ability to locate the temporal order of events is dependent upon source monitoring efficiency. Identifying the state of awareness that facilitates recognition accuracy

is important for our understanding of source monitoring efficiency on a recognition task. The SMF emphasises that the false recognition that results from source confusion, is attributed to familiarity acting in the absence of recollection (Dodson & Johnson, 1996; Johnson, 1997). This is supported by evidence that participants are more likely to give a 'remember' response to source-accurate, than source-inaccurate words (Mather et al., 1997). Yonelinas and Jacoby (1995) also agree that source-identification on a recognition task depends on recollection. The ability to select an answer from among a choice of alternatives on a recognition test depends on knowledge of the source of these 'alternative' responses.

Research supports the importance of a 'remember' state of awareness to accurate source-identification. Individuals are able to make more accurate judgements regarding the spatial location and temporal order of words when retrieval is based on 'remembering' rather than 'knowing' (Perfect et al., 1996, Experiment 1). In a subsequent experiment Perfect et al. reported that recollective experiences improved the ability to accurately identify the source of words presented in different lists (Perfect et al., 1996, Experiment 2). These results are consistent with the main tenets of the SMF. However, there is also evidence that 'remembering' may not prevent source confusion (Mazzoni & Loftus, 1996; Mazzoni et al., 1999). In the study by Mazzoni and Loftus (1996) elements from participants' dreams were erroneously 'remembered' to have occurred during their awake state. In a similar study Mazzoni et al. (1999) concluded that the false recognition that resulted from source mis-attributions after a 24-hour delay, had a recollective quality that was as strong as the recollective qualities of correct recognitions. It appears that the 'source' of one's memories is related to the type of mental experience reported at retrieval (Conway & Dewhurst, 1995). Conway and Dewhurst found that the proportions of correct 'remember' responses for objects and actions, decreased from performed, to watched and imagined conditions. However, both 'remembering' and 'knowing' contributed to source accuracy for watched events.

The present study examined two issues related to source monitoring; first, the relationship between states of awareness and source accuracy, and second, the association between source accuracy and event accuracy. The SMF emphasises the importance of 'remembering' to accurate source-identification. However, the SMF is criticised for not isolating and specifying the relationship between familiarity information and source

information (McElree et al., 1999). Specifically, McElree et al. said that the type of mental state that influences source decisions for recognition memory is unaddressed in the SMF literature. The present study attempts to fill part of this gap.

4.3 The relationship between detail type and recognition memory

Performance studies reveal the extent to which the centrality of an event influences the accuracy and confidence of eyewitness recognition. Wright and Stroud (1998) investigated central and peripheral detail recognition accuracy using a misinformation paradigm. Undergraduates were shown a computer display sequence of events depicting a shop-lifting. Participants were misled about certain events and they were asked to give a 'remember', 'know' or 'guess' judgement to each answer. Memory was evaluated 15 minutes after the event was shown and recognition was evaluated using a two-alternative forced choice test. The results revealed a greater acceptance of misinformation for peripheral but not central details. Moreover, the acceptance of both central and peripheral detail misinformation was accompanied by 'remember' judgements.

In a similar study Heath and Erickson (1998) examined the tendency to recognise misled central and peripheral details for original items. Participants viewed a slide sequence of a theft and read a narrative of the event. The source of the misinformation varied in the slide sequence only, the narrative only, or both conditions. The definitions of central and peripheral details were identical to the ones used in the present study. Recognition accuracy was evaluated after 10 minutes using a 2 alternative 'yes'/'no' forced-choice test. The results patterned those reported by Wright and Stroud (1998). There was a greater acceptance of misleading information for peripheral than central details while more source mis-attributions were made for more peripheral than central details. The present experiment examines the influence of detail type to recognition accuracy, confidence and CA resolution when memory was tested after a delay of 24 hours.

4.4 The confidence-accuracy association

The retrieval processes underlying recall and recognition produce differences in response accuracy, confidence and the strength of the CA association. Higher CA correlations are obtained for recall than recognition (Robinson & Johnson, 1996; Robinson,

Johnson & Herndon, 1997). Participants in the study by Johnson et al. (1997) viewed a video-taped crime and completed a recall or a recognition test based on the event. Although recognition accuracy was higher than recall accuracy, participants were more confident in their accurate recall than their accurate recognition responses, resulting in better CA resolution for recall. The mean CA correlations for recall was ($r = .55$.) and for recognition it was ($r = .45$.) after a 4-minute delay in testing. Bornstein and Zickafoose (1999, Experiment 1) reported a calibration score of (.28) and a gamma correlation of (.41). Participants in their experiment were exposed to a live event and memory was evaluated 2, 5 or 7 days after the event using a four alternative forced-choice test. Surprisingly, the researchers found no effect of delay on the CA association. Perfect and Hollins (1997) reported a mean CA recognition gamma of (.59) and a recall gamma of (.64) when memory was tested 10 minutes after the event.

4.5 Predictions and Method

The literature suggests that although recognition accuracy is good, confidence-accuracy resolution on an item discrimination task is less efficient, than recall. However, in light of the predictions outlined in the SMF it was expected that recognition accuracy and confidence in performance would be better for 'remembered' events, and that remembering would strengthen the CA association and improve source monitoring efficiency. The prediction was for higher central detail recognition accuracy and a stronger CA correlation for central detail memory.

Method

Design

The experimental design was identical to that used in Experiment 1a.

Participants

One hundred and ten students ranging in age from 16 - 40 years, ($M = 19$ years), were shown the stimulus material. However, 108 A-Level students and undergraduates (77 women, 31 men) completed all stages of the memory test. Fifty psychology undergraduates were recruited from the University of Southampton and they participated in the study in return for

4 research credits over two consecutive days. Undergraduates agreed to this condition before participating in the experiment. Consequently, all students completed both stages of the research. Fifty-eight A' Level psychology students from Peter Symonds College, Winchester participated as a practical exercise in the memory component of their Psychology program. Sixty students were shown the stimulus event but 2 students were absent during the memory test. Participants were randomly assigned on the basis of information type and presentation order to one of four groups; video information plus audio additional information, additional audio information plus video information, video information plus irrelevant audio information, or irrelevant audio information plus video information. Gender of the participants was balanced as far as possible across the groups.

Materials

To-be-remembered event

The stimulus material was identical to that used in Experiment 1a.

Questionnaire and Instructions

The questionnaire and instructions were identical to the ones utilised in Experiment 1b. Feedback from a sample of 30 participants revealed that participants understood the difference between 'remembering' and 'knowing'. The following quote illustrated the distinction participants made between the two states of awareness.

"When I remembered I had a fairly clear mental image, when I knew there was no mental picture but a vague feeling that the answer was correct." - female 35 years.

Procedure

The procedure was the same as the one used in Experiment 1a with the exception that participants completed a self-administered recognition test. A practice question was included at the beginning of the memory test to ensure that the task and the instructions were understood. Participants were given the opportunity to clarify the task before proceeding with the questionnaire. For each answered item on the recognition test participants made three subsequent judgements (1) a confidence rating measured on a 5-point Likert scale (where 1 = not very confident, and 5 = very confident); (2) a source judgement, video or

audiotape; and (3) a remember/know judgement. The order of the confidence, source and remember/know judgements was systematically varied using a Latin Square. Participants received one of three questionnaires in which the order of the judgements varied as follows: (1) remember/know, source and confidence judgements, (2) source, confidence and remember/know judgements, and (3) confidence, remember/know and source judgements. Participants were asked not to discuss the task with one another and their performance was monitored by the researcher. The memory test was completed within 25 minutes.

4.6 Results

Eyewitness Recognition

Only the responses pertaining to the video material were analysed. The audio material facilitated source discrimination and the data were not used in the analysis. The data were collapsed across the judgement order in the analysis. For each item on the recognition test, responses were categorized as either accurate, inaccurate, or don't know. The responses to the questions were scored in a 'blind' fashion; that is, regardless of the type of detail reported. This was done to prevent any bias in the data analysis which was identical to that used in Experiment 1a. Table 4.6.1 displays participants' confidence ratings, across central and peripheral details, for 'remember' and 'know' judgements. The data were obtained from the ANOVA analyses.

Total number of questions answered. The total number of questions participants answered, regardless of the accuracy of these responses, was calculated. Sixteen video-related questions were asked of all 167 participants. The mean number of questions answered and (standard deviation) were 7.73 (3.59). In general, participants recognised 48 percent of what they saw, compared to 36 percent of the information participants recalled in Experiment 1a. A two-way, repeated measures Analysis of Variance (ANOVA) of the effects of retrieval state and detail to the total number of questions answered revealed a high number of responses for questions remembered ($F(1, 107) = 60.38, MSE = 511.34, p < .001$) and for peripheral details ($F(1, 107) = 4.18, MSE = 8.47, p < .001$). The interaction between state and detail was non-significant ($F(1, 107) < 1, MSE = .75, p > .05$). The means (and standard deviations) for each experimental condition are summarised in the first row of the data presented in Table 4.6.1.

Number of correct responses. The mean number (and standard deviation) of questions participants correctly answered were 8 (3.58), or 48 percent, of the 16 questions asked. This was higher than the mean number of correct video questions participants recalled in Experiment 1a. A two-way, repeated measures ANOVA of the total number of correct responses by the state of awareness accompanying retrieval and detail type revealed that a ‘remember’ retrieval state was associated with more accurate responses than a ‘know’ retrieval state ($F(1, 108) = 63.25, MSE = 259.78, p < .001$). There was no difference in type of detail recognised ($F(1, 108) = 1.72, MSE = 1.45, p > .05$). The interaction between retrieval state and detail was non-significant ($F(1, 108) < 1, MSE = 1.59, p > .05$). The mean numbers of correct responses across retrieval state and detail are summarised in the second row of Table 4.6.1.

The mean number of incorrect responses derived from the ANOVA analysis to examine the effects of retrieval state and detail to the number of incorrect responses, is listed in the third row of Table 4.6.1. There were more incorrect responses remembered than known ($F(1, 107) = 15.96, MSE = 42.19, p < .001$), but there was no difference in the number of incorrect central and peripheral details recognised ($F(1, 107) = 1.07, MSE = .52, p > .05$). The interaction between the two variables was non-significant ($F(1, 107) < 1, MSE = .28, p > .05$).

Table 4.6.1. *Mean number of number of questions answered, correct responses, incorrect responses and proportion accuracy across state of awareness and detail together with confidence ratings (and standard deviations).*

	Central Details		Peripheral Details	
	Know	Remember	Know	Remember
No. of questions answered	1.72 (1.58)	3.98 (2.20)	1.99 (1.85)	4.08 (2.04)
No. of correct responses	1.08 (1.17)	2.67 (1.96)	1.23 (1.29)	2.75 (1.69)
No. of incorrect responses	.64 (.99)	1.32 (1.25)	.76 (1.05)	1.33 (1.31)
Proportion Accurate	.73 (.33)	.66 (.29)	.64 (.34)	.72 (.27)
Confidence when accurate	3.26 (1.27)	3.38 (1.14)	3.52 (1.25)	3.13 (1.05)

Proportion Accurate. The proportion of accurate responses was calculated in relation to all retrieval attempts, accurate and inaccurate. The effects of state of awareness and detail to accuracy by means of an Analysis of Variance (ANOVA), necessitated data in all the experimental conditions. Consequently the number of participants was reduced from 108 to 56 participants. The proportion of accurate responses is cited in the fourth row of Table 4.6.1. One consequence of leaving out participants who were not regarded as 'valid' cases in the ANOVA analysis, is that a false impression of the overall proportion of accurate central and peripheral detail responses is given. The proportion of accurate responses was calculated using the formula, the number of correct responses/total questions answered. When all participants were included in the analysis, the number of cases, mean proportion of accurate responses and (standard deviation) were 102, .66 (.28) respectively for central details remembered; 77, .67 (.35) respectively for central details known; 105, .69 (.27) respectively for peripheral details remembered; and 77, .65 (.34) respectively for peripheral details known.

An overview of the pattern of results displayed in Table 4.6.1 revealed an equivalent proportion of recognition accuracy for remember and know retrieval states, as well as for central and peripheral details. A similar pattern of results occurred for judgements of confidence. Separate analyses were conducted to investigate the effects of states of awareness and detail on the main issues under examination in this chapter; the proportion of accurate responses, confidence and the confidence-accuracy relationship. The results are presented in turn.

Proportion of Accurate Responses

The mean proportion of accurate responses ranged from .64 to .73 across the experimental conditions ($M = .69$) compared to the mean proportion of accurate recall ($M = .62$) obtained in Experiment 1a. Although the difference appears small, the data were consistent with other evidence in which recognition memory is more accurate than recall (Robinson & Johnson, 1996; Johnson et al., 1997). Analysis of the proportion of accurate responses by means of a two-way, repeated measures ANOVA, failed to confirm the experimental prediction because recognition accuracy was equivalent during 'remember' and 'know' retrieval states ($F(1, 55) < 1$, $MSE = .0004$, $p > .05$). Central and peripheral details were reported equally

accurately ($F(1, 55) < 1$, $MSE = .284$, $p > .05$), so the prediction was unsupported. The interaction between the two variables approached significance ($F(1, 55) = 3.95$, $MSE = .07$, $p = .052$). Subsequent analysis of this trend in the data by means of a paired samples t-test revealed a greater difference between central and peripheral details known ($t(55) = 1.49$, $p < .05$) than remembered ($t(55) = -1.44$, $p < .05$). Remembering has the potential for improving recognition accuracy for all details, than a 'know' retrieval state.

Confidence in Responses

Due to insufficient cases to calculate a three-way, repeated measures ANOVA to examine the effects of retrieval state, detail and accuracy on confidence, a two-way, repeated measures ANOVA assessed the effects of state and detail on confidence in accurate responses. There was no effect of retrieval state ($F(1, 40) < 1$, $MSE = .736$, $p > .05$) or details ($F(1, 40) < 1$, $MSE = .0003$, $p > .05$) on confidence. The interaction between the two factors was significant ($F(1, 40) = 6.48$, $MSE = 2.75$, $p < .025$) as displayed in Figure 4.6.2.

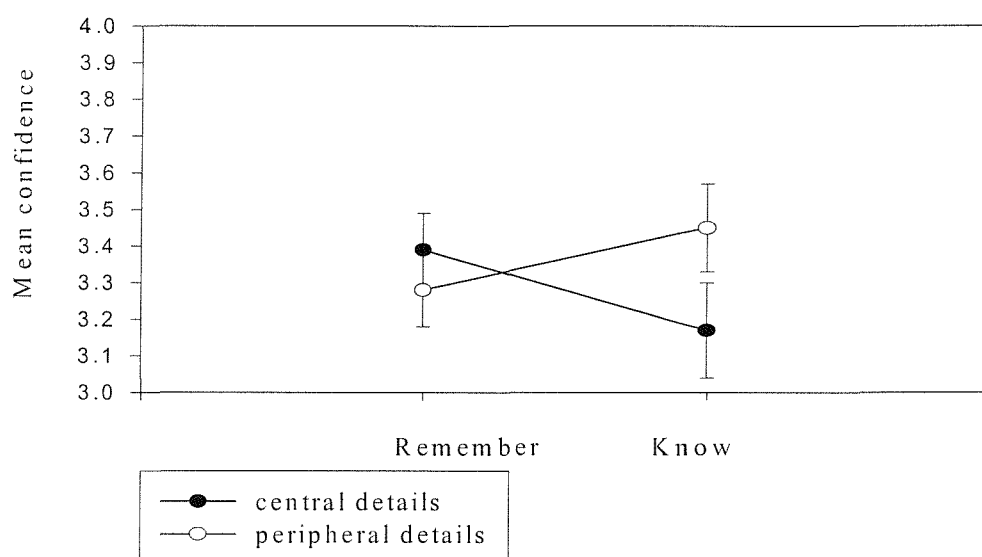


Figure 4.6.2. Interaction between retrieval state and detail on confidence, with standard error bars.

Analysis of the simple main effects, using a paired sample, 2-tailed t-test, revealed that confidence levels when reporting central and peripheral details varied more during a 'know' ($t(46) = 2.01, p < .05$), than a 'remember' retrieval state ($t(91) = .93, p > .05$). Participants were more confident when they accurately answered peripheral, than central details they knew.

To assess the difference between confidence levels when participants accurately and inaccurately reported information, a series of one-way, repeated measures ANOVA was conducted. The mean confidence ratings (and standard deviation) when participants accurately and inaccurately remembered central details were 3.34 (1.01) and 2.66 (1.03) respectively. The ANOVA analysis revealed that accurate responses were expressed more confidently than inaccurate ones ($F(1, 65) = 22.27, MSE = 15.21, p < .001$). Similarly, a one-way repeated measures ANOVA was conducted to evaluate the difference between confidence levels when participants accurately and inaccurately reported central details they knew. The mean confidence ratings (and standard deviation) when participants were accurate and inaccurate were 2.84 (1.31) and 2.45 (1.21) respectively. There was no significant difference between accurate and inaccurate responses ($F(1, 33) = 2.70, MSE = 2.58, p > .05$).

The mean confidence ratings (and standard deviation) when participants accurately and inaccurately remembered peripheral details were 3.31 (.94) and 2.82 (.89) respectively. Confidence was higher when participants were accurate ($F(1, 66) = 16.63, MSE = 8.04, p < .001$). Similarly, confidence was higher for accurate peripheral details known than inaccurate peripheral detail known ($F(1, 38) = 5.61, MSE = 3.12, p < .025$). The mean confidence ratings (and standard deviation) when participants accurately and inaccurately knew peripheral details were 3.01 (1.07) and 2.61 (1.20) respectively. Overall, the data demonstrated that a 'remember' state of awareness boosts confidence in the perceived accuracy of central details more than a 'know' retrieval state. However, confidence was high for all peripheral details recognised, regardless of the state of awareness accompanying retrieval.

Given the selective advantage of context reinstatement inherent in remembering to accuracy and confidence, the next subsection assesses the relationship between retrieval state and the strength of the confidence-accuracy correlation.

The Confidence-Accuracy Association

The strength of the confidence-accuracy association was examined using Goodman-Kruskal's gamma discussed in Experiment 1a. Table 4.6.3 summarizes the mean confidence-accuracy gamma data across state of awareness and detail. The mean CA gammas ranged from .23 to .42 ($M = .35$) and this was similar to other gammas obtained for eyewitness memory (Bornstein & Zickafoose, 1999, Experiment 1; Robinson et al., 1997). A one-sample t-test was used to assess the significance of the mean in each experimental condition from zero and significant correlations were obtained for peripheral details 'known' and central and peripheral details 'remembered'. As was mentioned in Experiment 1a, the number of cases that comprised the CA gamma data cited in Table 4.6.3, varied from the number of cases, and the mean performance of participants, displayed in Table 4.6.1. In answering the experimental questions, various analyses were performed resulting in a filtering out of participants.

Table 4.6.3: *Mean confidence-accuracy gamma correlation (and standard deviations) across state of awareness and detail.*

	Central Details	Peripheral Details
'Know' judgements	.23 (.19)	.40 (.15)*
Remember seeing' judgements	.42 (.09)*	.33 (.11) *

* $p < .05$, (2-tailed)

An ANOVA analysis reduces the number of valid cases so a Wilcoxon signed ranks, 2-tailed test was conducted to examine the effects of state of awareness and detail type to the strength of the CA correlation. There was no significant difference between 'remembering' and 'knowing' to the central detail CA correlation ($z = 1.054$, $p > .05$). The mean (and sum) of the ranks in which remembering facilitated the central detail CA correlation was 5.10 (25.50), while the mean (and sum) of the ranks in which a 'know' mental state improved the central detail CA correlation was 3.50 (10.50). However, there was a significant difference between 'remembering' and 'knowing' to the peripheral detail CA correlation ($z = 2.207$, $p < .05$). The mean (and sum) of the ranks in which remembering facilitated the peripheral detail CA correlation was 0.00 (.00), while the mean (and sum) of the ranks in which a

'know' mental state improved the central detail CA correlation was 3.50 (21.00). The data in Figure 4.6.4 suggested that a 'know' retrieval state improved confidence-accuracy predictions for peripheral information, more than a 'remember' retrieval state. However, given the lack of data in some conditions, the results must be treated with caution, or the study replicated, before the results can be accepted.

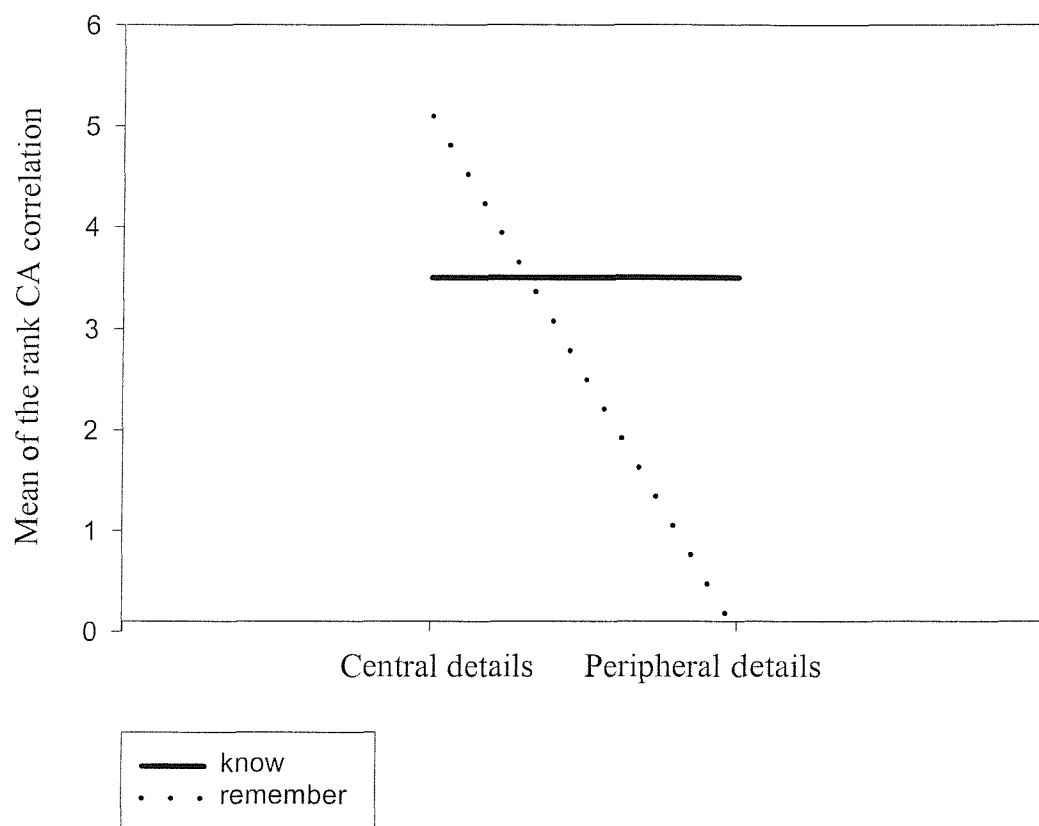


Figure 4.6.4 The effects of states of awareness on the peripheral detail confidence-accuracy correlation.

When the effect of detail type was considered, no significant difference was observed between the central and peripheral detail CA correlations reported during a 'remember' state of awareness ($z = .994$, $p > .05$). The mean (and sum) of the ranks in which the central

detail CA correlation was higher than the peripheral detail CA correlation was 19.75 (355.50), while the mean (and sum) of the ranks in which the peripheral detail CA correlation was higher than the central detail CA correlation was 14.97 (239.50). Similarly, there was no difference between the central and peripheral detail CA correlations reported during a 'know' state of awareness ($z = .878$, $p > .05$). The mean (and sum) of the ranks in which the central detail CA correlation was higher than the peripheral detail CA correlation was 3.80 (19.00), while the mean (and sum) of the ranks in which the peripheral detail CA correlation was higher than the central detail CA correlation was 7.20 (36.00).

The relationship between states of awareness, detail and source accuracy

This series of analyses examines the complex relationship between state of awareness, source, and detail on accuracy. The proportion of accurate responses was used in all the analyses. A hierarchical multiple regression analysis was conducted to answer the question, to what extent can eyewitness accuracy be predicted from witnesses' state of awareness at retrieval (Block 1), source accuracy (Block 2) and detail type (Block 3). Event accuracy, the criterion variable, was computed as the proportion of accurate responses from total responses, both accurate and inaccurate.

The relationship between a 'remember' retrieval state, the predictor variable, and event accuracy was assessed in the following way. For each participant the proportion of accurately remembered information, from all information remembered, was computed. Similarly, in order to estimate the relationship between a second predictor variable, the 'know' retrieval state, and event accuracy, the proportion of 'know' responses that was accurate, from all information 'known,' was calculated for each participant.

The results of Block 1 indicated that 'remember' and 'know' states of awareness accounted for a significant amount of the accuracy variability $R^2 = .84$, $F(2, 89) = 233.95$, $p < .001$. Remember and know judgements not only reflect the overall rate of eyewitness responses, but people who give 'remember' and 'know' responses are more likely to be accurate than inaccurate. The standardized regression coefficient for the 'remember' state of awareness was (.67, $p < .001$) and for the 'know' state it was (.56, $p < .001$).

A second analysis was conducted to evaluate whether source accuracy predicted accuracy over and above states of awareness at retrieval. The proportion of source accurate

information was computed in relation to the total source information reported. This included central and peripheral details that were remembered and known. The results of Block 2 indicated that source accuracy did not contribute to the accuracy variability after controlling for the effects of state of awareness, R^2 change = .000, $F(1, 88) = .10$, $p > .05$. The standardized regression coefficient was $(-.01, p > .05)$.

A third analysis was conducted to examine whether detail type predicted accuracy after controlling for the effects of state of awareness and source accuracy. Detail type included central details remembered and known, as well as peripheral details remembered and known. The results showed an R^2 change = .12, $F(2, 86) = 115.83$, $p < .05$. The standardized regression coefficient was $(.44, p < .05)$ for central details and $(.46, p < .05)$ for peripheral details. Together the five variables explained 97 percent of the accuracy variability, $R^2 = .96$, $F(5, 86) = 380.77$, $p < .001$. Table 4.6.5. summarises the B, standard error, beta values and the partial correlation of the predictors in each set of variables.

Table 4.6.5. Hierarchical multiple regression of predictors of accuracy

Blocks	<i>B</i>	Standard error	Beta	Partial correlations
Block 1:				
Remember	.52	.03	.56*	.86
Know	.35	.03	.67*	.81
Block 2:				
Source accuracy	-.02	.01	-.01	-.03
Block 3:				
Central detail	.31	.02	.44*	.83
Peripheral detail	.40	.03	.46*	.79

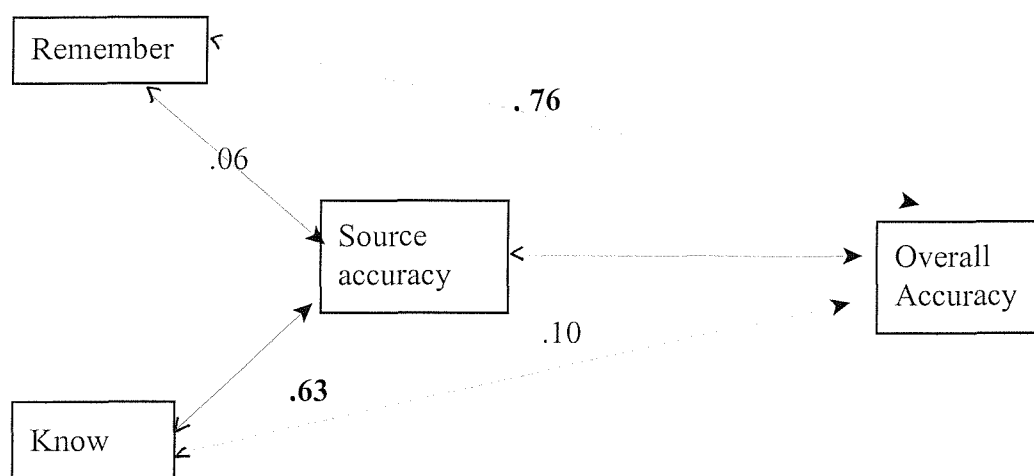
* Significant at $p < .05$.

To what extent is a 'remember' retrieval state a good predictor of (1) accuracy, and (2) source accuracy? To what extent is source accuracy a good predictor of event accuracy? These questions were addressed in a series of linear regression analyses. The results of a linear regression analysis to evaluate the prediction of accuracy from a 'remember' state of awareness at retrieval, revealed that the correlation between 'remembering' and accuracy

was .76, $t(106) = 12.03$, $p < .001$. Approximately 57 percent of the variance of accuracy was accounted for by its linear relationship with a 'remember' retrieval state. The correlation between a 'know' retrieval state and accuracy was .63, $t(90) = 7.67$, $p < .001$. Thirty-nine percent of the variance of accuracy was accounted for by its linear relationship with a 'know' retrieval state. In response to the first question, 'remember' and 'know' states of awareness both contribute significantly to eyewitness accuracy. It is possible that people who make more remember responses also give more know responses. When the beta coefficients for remember and know are added, they sum to 1.39.

The second question was, to what extent is a 'remember' retrieval state a good predictor of source accuracy? The results of a linear regression analysis revealed that the correlation between 'remembering' and source accuracy was .06, $t(106) = .64$, $p > .05$. None of the variance of source accuracy was accounted for by its linear relationship with a 'remember' retrieval state. The correlation between 'knowing' and source accuracy was .10, $t(90) = .98$, $p > .05$. None of the variance of source accuracy was accounted for by its linear relationship with a 'know' retrieval state. There was no evidence that the state of awareness at retrieval contributed significantly to source accuracy.

The third question was, to what extent is source accuracy a good predictor of overall accuracy? A linear regression analysis revealed that the correlation between source accuracy and event accuracy was .10, $t(106) = 1.00$, $p > .05$, with 0 percent of the variance of accuracy being accounted for by its linear relationship with source accuracy. The results contradicted one of the main predictions of the SMF which states that source identification helps in retrieving the associated details that are necessary to accurately report an experience (Johnson et al., 1993). The path diagram displayed in Figure 4.6.6 was based on the standardized beta coefficients obtained in the series of linear analyses previously described. The diagram displays how retrieval state, memory for source and overall accuracy inter-relate.

Figure 4.6.6 Path coefficients between retrieval state, source and overall accuracy

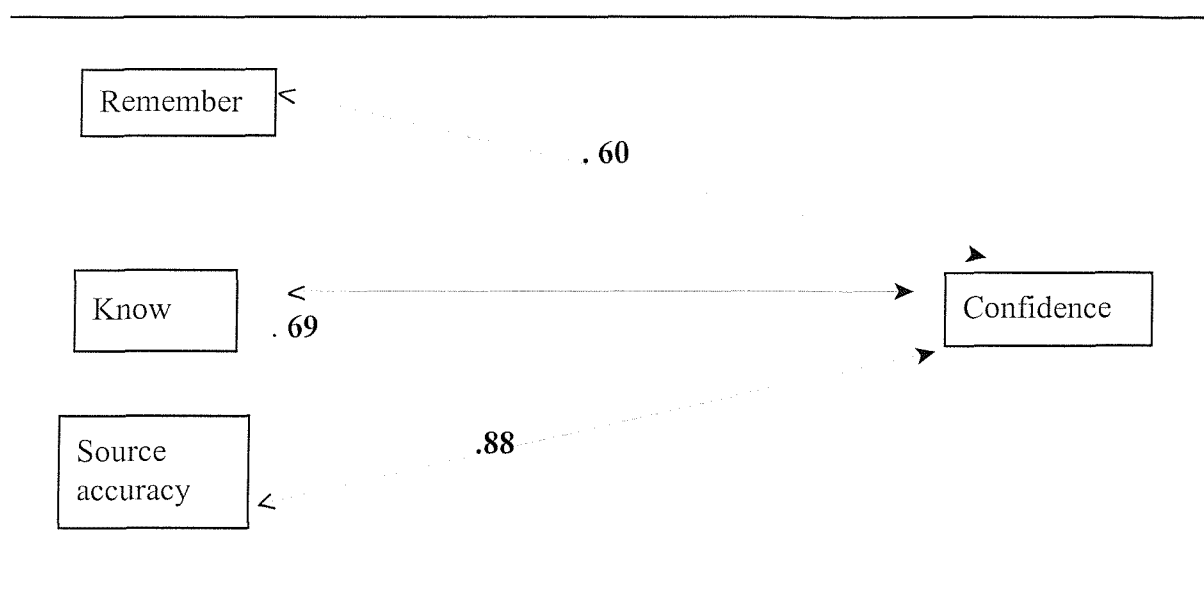
Coefficients in bold font are significant at $p < .05$.

The results of a linear regression analysis to evaluate the prediction of confidence from a 'remember' state of awareness at retrieval, revealed that the correlation between 'remembering' and confidence was .60, $t(105) = 7.76$, $p < .001$. Approximately 36 percent of the variance of confidence was accounted for by its linear relationship with a 'remember' retrieval state. The correlation between a 'know' retrieval state and confidence was .69, $t(88) = 8.82$, $p < .001$. Forty-six percent of the variance of confidence was accounted for by its linear relationship with a 'know' retrieval state. In response to the first question, both 'remember' and 'know' states of awareness at retrieval significantly boosted eyewitness confidence. Therefore, it appears that participants who make more remember judgements also made more know judgements. The two beta coefficients summed to 1.48.

The second question was, to what extent is source accuracy a good predictor of confidence in memory. A linear regression analysis revealed that the correlation between source accuracy and confidence was .88, $t(106) = 18.62$, $p < .001$, with 76 percent of the variance of confidence being account for by its linear relationship with source accuracy. The path diagram displayed in Figure 4.6.7 was based on the standardized beta coefficients obtained in the series of linear analyses previously described. The diagram displays how

retrieval state, memory for source and confidence inter-relate.

Figure 4.6.7 Path coefficients between retrieval state, source and confidence



Coefficients in bold font are significant at $p < .05$.

4.7 Discussion

The examination of recognition accuracy was consistent with the objective of this thesis to examine the influence of states of awareness accompanying confidence-accuracy processing under various retrieval conditions. The contributions of remember/know judgements to recognition accuracy, confidence and the confidence-accuracy relationship were evaluated for central and peripheral details of the eyewitnessed event. In light of the data obtained in Experiment 1a as well as other recognition studies based on the remember/know procedure, it was expected that more 'remember' than 'know' judgments would accompany recognition accuracy. Furthermore, a 'remember' state of awareness at retrieval would lead to expressions of high confidence in recollections. Consequently, a remember state of awareness at retrieval was expected to facilitate reliable confidence-accuracy judgments. The second experimental prediction related to better memory and meta-memory performance for central than peripheral information. This prediction was based on the confidence-accuracy data reported in Experiment 1a, as well as the claims of attentional focus theory. The discussion is divided into two main areas. The first sub-section outlines

the influence of state of awareness to confidence-accuracy resolution. This is followed by a discussion of the relationship between remember/know state of awareness and source monitoring. The appropriateness of Tulving's remember/know paradigm and the source monitoring framework for explaining the reliability of eyewitness memory monitoring and source monitoring efficiency are evaluated in light of the data obtained in Experiment 1c.

The relationship between mental states at retrieval and the CA association

Recognition accuracy

Recognition accuracy and confidence are first discussed before considering the CA association. The mean proportion of accurate responses was not at ceiling level given the relative ease of a recognition task identified by Robinson and Johnson (1996). Perhaps this was due to the 24 hour delay employed in the experiment. Although this was not a lengthy delay, recognition accuracy is reduced with the passage of time (Payne et al., 1996; Seamon et al., 2000). The main objective of the study was to evaluate if 'remembering' facilitates eyewitness recognition accuracy more than 'knowing'. The data failed to find evidence that a 'remember' retrieval state contributes significantly to recognition accuracy as previously reported for word-recall (Donaldson, 1996; Java et al., 1998; Perfect et al., 1996; Tulving, 1985; Toplis, 1997).

Perfect et al. reported that individuals made more accurate judgements regarding the spatial and temporal order of test items for remembered items, than those judged to be known. In the introductory chapter the differences between memory for simple stimuli and eye-witnessed events were outlined. So the recognition data obtained in this experiment suggest that the benefits of remembering may be limited for complex eye-witnessed events. An examination of Table 4.6.1 revealed that the number of incorrect responses, commission errors, was higher for information remembered than known. This occurred for both central and peripheral details and the data fit empirical evidence of false recognition during a remember retrieval state (Holmes et al., 1998), and information falsely recalled (Experiment 1a).

Another explanation for the data is that the alternative answers on the recognition test functioned as cues and assisted memory. Consequently, accuracy improved because of the

response cues and not the state of awareness at retrieval. The comment of a participant in the experiment illustrated why this explanation is plausible.

"I remembered the information when I could almost 'see' or hear it in my mind. It was easier to remember when there was a choice of answers." - female 18 years.

An alternative explanation for the data is that recognition accuracy is facilitated by both a conscious awareness of specific details of an event, as well as a general sense of 'knowing' that an incident occurred (Haist et al., 1992; Jacoby & Dallas, 1981; Mandler, 1980; McElree et al., 1999).

Contrary to attentional-focus theories and data that showed that eyewitness memory is more reliable for central details (Heath & Erickson, 1998; Wright & Stroud, 1998), central and peripheral details were recognised equally accurately in the present study. Improvements in overall memory may be attributed to the ease of a recognition task or the presence of the retrieval cues in the alternative answers. There were no significant effects of states of awareness at retrieval or detail type to recognition accuracy. However, the interaction between state and detail to recognition accuracy approached significance. Subsequent analysis of this trend in the data revealed that remembering reduced the gap between the proportion of accurate central and peripheral details recognised, more than knowing. This finding diverges from the view that the ability to remember or mentally re-instate an event is dependent upon the characteristics of the target information (Dodson & Johnson, 1996).

Confidence

It was expected that a remember state of awareness would increase individuals' confidence in the accuracy of their recollections. Confidence was also expected to be higher for central detail memory. The data failed to support these two predictions; instead, a significant interaction between state of awareness and detail type occurred. Specifically, participants were more confident when they accurately answered peripheral than central detail questions they 'knew'. Figure 4.6.2 illustrated that confidence was higher for accurate peripheral details participants knew than remembered. This was not surprising when one considers that the weak memory traces underlying peripheral detail memory may make it

difficult to 'remember' these events. Yonelinas and Jacoby (1995) argue that on a standard recognition test, 'old' items may be identified on the basis of knowing the material. When participants are required to rate the confidence of their recognition judgements, then a know state of awareness is used as a basis for confidence judgements. Attentional focus theories claim that trace strength affects accuracy. According to this belief central detail memory and the ability to remember events should increase confidence in memory. However, the data from the present study suggest that confidence levels do not necessarily relate to trace strength, a view that is expressed by Gardiner and Parkin (1990).

The confidence-accuracy relationship

The data so far indicated that the state of awareness at retrieval was unrelated to recognition accuracy, but a 'knowing' retrieval state increased confidence in peripheral detail memory. Similarly, the state of awareness at retrieval had a significant effect on participants' ability to reliably match accuracy and confidence. A 'know' retrieval state, more than a 'remember' one, facilitated CA resolution for peripheral information. Not only do participants answer questions on the basis of knowing the information (Yonelinas & Jacoby, 1995), but a 'know' retrieval state influenced judgements of meta-memory and assisted CA resolution.

The relationship between remember/know state of awareness and source monitoring

Familiarity with, or knowing information was adequate for confidence in recognition accuracy and CA resolution, but does a 'know' retrieval state improve source discrimination? It is difficult to isolate the contribution of each state of awareness in a typical recognition task involving source monitoring (McElree et al., 1999). The data from Experiment 1c were consistent with the problem identified by McElree et al. Recognition accuracy was equivalent for answers 'known' and 'remembered'.

The SMF emphasises the importance of efficient source monitoring for overall content accuracy. However, there was no evidence either from the hierarchical regression analysis or the linear regression analysis, that source accuracy improved content accuracy or vice versa. Memory theorists believe that recognition is assisted by both familiarity and context reinstatement (e.g. McElree et al., 1999), but source identification requires

remembering contextual details (Johnson et al., 1993). Hence participants in the present study either knew or remembered the general context of the observed event but there was perhaps insufficient detail for source identification. A comment by a participant in the study provided an insight into the difficulty of source monitoring even while remembering an event.

“I could picture colours and sounds but didn’t know whether they were remembered from the right context.” - female 17 years.

The difficulty in separating memory for source and memory for content is acknowledged in the literature (Lindsay, 1990; Zaragoza & Lane, 1994). Similarly, a ‘remember’ judgement is regarded by some theorists as an implicit ‘source’ judgement (Hyman et al., 1998).

Methodologically, the combination of source and item discrimination has been criticised (Bayen, Murnane & Erdfelder, 1996). Bayen et al. argue that tests in which recognition and source monitoring are combined raise important measurement issues because commonly used empirical measures of source monitoring confound memory for the item with memory for the source. They proposed instead multinomial models of source monitoring which are based on the assumption that the probabilities of different behavioural responses can be mapped onto the probabilities of different underlying cognitive states. Multinomial models define two types of cognitive tasks on a source monitoring recognition task; one that describes the item discrimination component of the task, and the other that describes the source discrimination component. The advantage of multinomial theories over the SMF is that multinomial theories provide several independent measures of measuring performance in a source monitoring task (Bayen et al., 1996).

When the strength of the relationship between mental states at retrieval and confidence in memory was examined, remember and know states of awareness were significantly related to overall confidence. An indication that perhaps participants who made remember judgements also gave more know judgements. Source accuracy was a strong predictor of confidence in overall accuracy. Both results were consistent with the predictions of the SMF that re-experiencing an event by remembering it increases confidence in the accuracy of those recollections. However, it is more important to identify the conditions that facilitate confidence-accuracy resolution, or the matching of confidence and accuracy

decisions, than to identify the conditions than merely affect confidence.

Conclusion

This experiment examined the contribution of remember/know judgements to recognition accuracy and the confidence-accuracy relationship within a central/peripheral differential for eyewitness memory. The state of awareness at retrieval was unrelated to recognition accuracy, but knowing events increased confidence in peripheral detail memory.

Consequently, a 'know' retrieval state was associated with a stronger CA correlation than a 'remember' retrieval state, but this effect was limited to the reporting of peripheral events.

These results differed from the pattern of data reported in Experiment 1a, adult recall. An overview of Experiments 1a, 1b and 1c is presented in the next chapter.

CHAPTER FIVE

Overview of Experiments 1a, b, and c.

At the core of the series of experiments was the idea that the availability of contextual information that occurs when individuals have a clear recollection of remembering events, facilitates response accuracy and strengthens the confidence-accuracy (CA) relationship. The experiments were grounded in the Source Monitoring Framework (Johnson et al., 1993) and Tulving's remember/know procedure was used to evaluate witnesses' state of awareness accompanying their accurate and inaccurate reports. The focus of the research resulted from empirical evidence in which memory for eye-witnessed events generated weak CA correlations compared to memory for general knowledge (e.g. Bornstein & Zickafoose, 1999). The purpose of the studies was to identify how the mental state of awareness and the type of detail reported relate to the confidence-accuracy association. Therefore, the conditions that facilitate more reliable CA judgements could be identified.

Eyewitness errors are sometimes due to source mis-attributions so accuracy and confidence in performance were also evaluated on a source monitoring task. The data contributed to existing research on three accounts; first, the results illustrated how CA decisions are monitored on the basis of the state of awareness and type of detail accompanying information retrieval; second, the data explained the role of states of awareness in source monitoring; and third, the strength of the confidence-accuracy relationship was examined for non-recollective, feeling of knowing experiences (Experiment 1b). The following discussion focusses on these three issues in turn.

5.1 States of awareness and the confidence-accuracy association

Recall. In order to understand how CA decisions are approached by a witness, the mental states underlying accurate responses and confidence were examined separately. Remembering was associated with more total responses and accurate recall, than a know retrieval state. It is worrying that incorrect answers are likely to be remembered than known. However, this concern was offset by the fact that the proportion of accurate responses was higher for remember-based than know-based retrieval. The specific contribution of the data from Experiment 1a was to illustrate the benefits to eyewitness accuracy when participants

can reinstate an event, contextualise details and thus remember the incident. Remembering has proven to be beneficial to word recall accuracy (Toplis, 1997, Experiment 1; Tulving, 1985, Experiment 1) and autobiographical memory (Conway et al., 1998; Hyman et al., 1998), but now the benefits extend to eyewitness memory. The findings are consistent with the views that the re-experiencing of events (Tulving, 1985) and an optimal retrieval state (Deffenbacher, 1980) improve performance, in this case recall accuracy. Central and peripheral details were reported equally accurately. This was a more optimistic result than the central detail accuracy bias reported in the eyewitness literature (Burke, Heuer, & Reisberg, 1992; Freedman et al., 1996; Heath & Erickson, 1998; Migueles & Garcia-Bajos, 1999; Wright & Stroud, 1998).

The pattern of results was identical for confidence ratings. Remember-based accurate answers were more confidently expressed than accurate answers known, so the data were consistent with other empirical evidence (Duzel et al., 1997; Toplis, 1997; Tulving, 1985). Furthermore, accurate central and peripheral details that were judged to be 'remembered' at retrieval, were expressed with more confidence than inaccurate central and peripheral details 'remembered'. However, there was no difference in the confidence expressed for accurate and inaccurate information known, regardless of the type of detail reported. Thus remembering serves to discriminate knowledge that is correct from knowledge that is incorrect. This is an important finding because it is consistent with the main premise of the source monitoring framework.

Central and peripheral details attracted equivalent confidence ratings. Participants' feedback confirmed that remembering boosted confidence in memory because of the mental reinstatement and imaging that accompanied the re-experiencing of events. This conformed to a belief expressed by Haist et al. (1992) that recall requires extensive reinstatement of the event. Forensically, the results have the potential for improving the reliability and quality of witness reports, by emphasising the importance of context reinstatement and self-knowing when questioning witnesses. However, information 'known' can also be accurate, though not as accurate and events 'remembered'.

The novelty of the thesis was to examine the influence a 'remember' retrieval state may have on the confidence-accuracy association. The evidence from Experiment 1a indicated that the ability to 'remember' events and to reliably match confidence and accuracy judgements was dependent upon the type of detail reported. Specifically, remembering

facilitated CA predictions more than knowing, but this advantage was limited to the reporting of central, salient details. Although there was no central detail bias in memory, it manifested itself in participants' ability to match confidence and accuracy.

Recognition. A different pattern of results emerged for recognition accuracy. There was no significant effect of the state of awareness at retrieval to recognition accuracy although there is evidence that word recognition benefits from a 'remember' state of awareness at retrieval (e.g. Donaldson, 1996; Perfect et al., 1996; Tulving, 1985, Experiment 2). The complexity of eyewitnessed events caused some participants in Experiment 1c to 'remember' incorrect information. There was a moderating effect of detail type on retrieval state in influencing confidence in recognition. Participants were more confident when they knew peripheral than central information. This resulted in a high CA correlation for peripheral details participants knew.

Taken together, the data from the recall and recognition studies reflected a difference in the retrieval process that is discussed by some theorists. Although it is acknowledged that recall and recognition accuracy are both context dependent (Gillund & Shiffrin, 1984; Raaijmakers & Shiffrin, 1992; Tulving, 1985), successful recall requires more extensive context reinstatement than recognition. Recognition accuracy occurs during remember and know retrieval states (Haist et al., 1992; Jacoby & Dallas, 1981; Mandler, 1980; McElree et al., 1999).

5.2 States of awareness and source monitoring

A 'remember' state of awareness is believed to improve memory because it encourages source monitoring to verify the origins of memory. Source monitoring is more efficient during a 'remember' than a 'know' retrieval state (Henkel et al., 2000; Hyman et al., 1998, Experiment 2). Contrary to these expectations, neither a 'remember' nor a 'know' state of awareness at recall was related to source accuracy, although remembering boosted confidence in memory. An important finding was that source accuracy was significantly related to overall content accuracy, confirmation that the ability to identify the source of an experience brings to mind the target or associated details that are necessary for the accurate reporting of that event (Johnson et al., 1993).

The accurate recognition of source material was unrelated to the state of awareness at retrieval. It is believed that adults rely on cognitive-operations information during cognition,

such as the length of time it takes to form a mental image of the source of one's knowledge, to assess source accuracy (Woolley & Bruell, 1996). However, there was no evidence from the present series of studies that source accuracy improved during a 'remember' retrieval state. Unlike adult recall, source accuracy was not a good predictor of overall content accuracy. Some theorists suggest that on a recognition test, recognition accuracy does not always depend on source accuracy (Dobson & Johnson, 1996) and the data conformed to this belief.

5.3 States of awareness and Feeling of Knowing (FOK) Predictive Accuracy

The investigation of the states of awareness accompanying FOK predictive accuracy as well as the FOK confidence-accuracy relationship were consistent with the main aims of the thesis which was the examination of the states of awareness underlying response accuracy and CA resolution. There are currently very few studies on the predictive accuracy of eyewitness memory so the data from Experiment 1b, although based on limited cases, served as exploratory results that need to be replicated in future experiments. The novelty of Experiment 1b was the measurement of the FOK-CA correlation since current FOK experiments compute a FOK-recognition correlation. The FOK-CA correlation assesses the extent to which initially unanswered questions that prompted a FOK, lead to subsequent accurately recognised and confident statements. The FOK-recognition correlation evaluates the association between FOK judgements and recognition accuracy.

Participants gave an equivalent proportion of FOK judgments, in relation to don't know responses, to unanswered central and peripheral detail questions. There was a significant difference between remembering and knowing central details to FOK recognition accuracy; specifically, central details 'known' were more accurate. These data indicate that recognition is superior to recall and that retention exceeds retrieval (Hart, 1965; Koriati, 1998). Some FOK experiences are based on 'hunches' and they are linked to the sense of familiarity that characterises Tulving's 'know' state of awareness (Koriati & Levy-Sadot, 1999; Lories et al., 1998). The data from Experiment 1b is consistent with the view that FOK-predictive accuracy may follow a 'know' retrieval state.

5.4 Conclusion

An overview of the data revealed that the type of detail reported had more of an impact on recognition than recall memory, and this occurred for accuracy, confidence and the CA relationship. This pattern of results is not surprising as recall tests are reported to be less sensitive to the contents of memory than recognition tests (Brainerd & Reyna, 1996). The next series of experiments examined the reliability of children's confidence-accuracy decisions. To date this remains neglected in the meta-cognitive and eyewitness literature so the data from these studies are valuable because they offer an insight into children's memory monitoring efficiency.

CHAPTER SIX

Experiment 2a: The Relationship between States of Awareness, Confidence-Accuracy Judgements and Source Monitoring Accuracy for Children's Delayed Recall

"There is a sense of urgency regarding the need for improved methods of discriminating between accurate and inaccurate allegations." (Poole & Lindsay, 1998).

6.1. Introduction

Experiment 2a responded to the call for more research into the strengths and weaknesses of children's memory including their memory monitoring skills (Bruck, Ceci & Hembrooke, 1998). Many of the factors that affect adult memory also affect children's memory. In Experiment 1a, adults who remembered details of an eye-witnessed event were more accurate and confident in their recall than witnesses who knew the information they reported. The confidence-accuracy association was strong for remembered central details. Surprisingly, remembering did not improve source accuracy. In order to examine the generalizability of these results Experiment 1a was replicated with children 9-10 years. To date there is little research on the reliability of children's confidence-accuracy judgments for eyewitness memory; therefore, the data obtained in this study provided a valuable contribution to the eyewitness literature.

The goals of the present study were identical to the ones outlined in Experiment 1a. The experiment examined the link between remember/know states of awareness at retrieval to children's recall accuracy and the strength of the CA association. A source monitoring task was incorporated in the study and recall was evaluated for the central and peripheral details of an eye-witnessed event after a 24 hour delay. The degree to which source accuracy is a good predictor of overall content accuracy was also investigated. Experiment 2a addressed the pre-requisites that Poole and Lindsay (1998) identified as being necessary for children's accuracy. They claimed that children needed two skills in order to accurately respond to questioning; children must be able to engage in source monitoring and they must realise that the interviewer wants them to report only from personal experience. The emphasis on 'personal experience' fits Tulving's (1985) description of autonoetic or self-knowing consciousness. Young children have the ability to remember the origins of their

mental representations (Woolley & Bruell, 1996) and they are capable of differentiating between their remember/know states of awareness (Toplis, 1997).

There is a danger in comparing results across experiments since disparities may reflect methodological differences in the choice of stimuli, age of the participants, and the procedure. Nevertheless, it is useful to examine general conclusions in order to make predictions about children's recall accuracy as well as their memory and source monitoring accuracy. Children are as accurate as adults in reporting the color and location of objects (Ling & Blades, 1996), in recalling 'live' events (Goodman & Reed, 1986; Shrimpton et al., 1998), in identifying the source of their knowledge (Powell & Thompson, 1997) and when reporting events after a 48-hour delay (Ornstein, Baker-Ward, Gordon & Merritt, 1997). Errors arise when children infer details or incorporate post-event, suggested details into material they actually remember (Ornstein et al., 1997; Pezdek & Roe, 1997) and this is more likely to occur when reporting peripheral than central details (Gobbo, 2000). The discrepancies between 'experienced' and 'imagined' events could be reduced if children were able to 're-vive' an experience and confirm the source of their knowledge (Johnson et al., 1993; Tulving, 1985). This ability to engage in mental context reinstatement characterises a 'remember' retrieval state and it improves accuracy and confidence in children's recall (Toplis, 1997). Remembering should also assist children to make more reliable CA judgements in the same way as it facilitated CA judgements with adult participants (Experiment 1a).

Tulving's remember/know procedure has been used to examine the accuracy of words recalled by 8-10 year olds (Toplis, 1997, Experiment 1). Toplis considered the effects of states of awareness to accuracy and confidence separately, but not the overall confidence-accuracy relationship. Nevertheless, the study makes an important contribution to the literature because it demonstrated that children were capable of distinguishing between remembering and knowing, and that accuracy and confidence improved during a 'remember' retrieval state. In a subsequent experiment, Toplis combined the remember/know procedure with a source monitoring task. Children 8-9 years and 11-12 years were presented with an assortment of toys and these objects were shown in pairs. Children performed, watched and imagined an action involving the toys. Following a 10 minute delay the participants were given either a cued recall or a recognition test. Participants were shown one object from the

pair earlier presented to them and they were asked to name the other pair. If a response was given, children were subsequently asked to state if they 'remembered', 'knew' or 'guessed' the answer. The results of the cued recall test revealed more 'remember' than 'know' judgements across all the source conditions and age groups. Remember and know judgements accompanying recall accuracy declined from the performed to the watched and imagined source conditions for the 8-9 year olds as well as the 11-12 year olds. There were more remember than know judgements for performed than imagined actions, and more remember than know judgements for watched than imagined actions.

The courts believe that children possess an equivalent ability to report central and peripheral details (Davies et al., 1997). Experimental evidence demonstrates that children's central detail memory is more accurate than memory for peripheral events (Cassel & Bjorklund, 1995; Poole & White, 1991). However, others studies report that memory for central details is as unreliable as memory for peripheral details (Leippe, Romanczyk & Manion, 1991). Cassel and Bjorklund showed 8 year olds a video clip of two children arguing over a bicycle and subsequently tested children's recall accuracy for various details. They reported that the central detail items were never 'remembered wrong', but the descriptions of related, peripheral events contained inaccuracies. Leippe et al. examined children's memories for a touching incident that occurred when they interacted with a confederate. The difference in being a 'victim' rather than a 'by-stander' may explain the variation in the results reported in the two studies. While a 'remember' state of awareness is expected to improve memory for all types of details, higher accuracy for central details suggest that there is more room for improving children's recall of peripheral information.

6.2 Predictions and Method

The results of Toplis's study, Experiment 1a, the predictions of the SMF and the remember/know paradigm led to the prediction that a remember state of awareness at retrieval would improve recall accuracy, confidence and the confidence-accuracy relationship, more than a know state of awareness. Attentional-focus theories predict selective attention to central details at the expense of peripheral information, or that gist details will be more accurately reported over time than the verbatim of the event. Consequently, it was expected that accuracy, confidence and the confidence-accuracy

relationship would be higher for central than peripheral detail memory.

Method

Design

The experimental design was identical to the one used in Experiment 1a.

Participants

One hundred and ninety children were shown the stimulus but 181 of them (93 girls, 88 boys) ranging in age from 9-10 years, ($M = 9$ years, 5 months), completed the two phases of the study. They were recruited from three schools in Southampton, Bassett Green Junior School, North Baddesley Junior School and Swaythling Primary School. Participants were randomly assigned on the basis of information type and presentation order to one of the four groups described in Experiment 1a. Gender of the participants was balanced as far as possible across the groups.

Materials

The materials and questionnaire were identical to that used in Experiment 1a.

Instructions

The wording of the instructions and the questionnaire were simplified for use with children (e.g. 'How confident do you feel that your answer is correct?' was changed to 'How sure are you that your answer is correct?'). Important phrases were repeated to ensure clarification.

The instructions were as follows.

"When you answered the question, if you remembered SEEING or HEARING in your mind the information you needed to answer the question, then you REMEMBER the answer. If instead you simply had a feeling that 'I just know' the answer but you do not have a picture of the answer in your mind, then you KNOW the answer to the question. Please don't guess and try to be as accurate as possible. If you cannot answer the question, I want you to tell me if this was because (a) you did not know the answer or (b) you feel you would know the answer if I gave you some clues."

The training protocol and the 'Breakfast example' used in Experiment 1a, to explain the difference between 'remember' and 'know' states of awareness were also used in this experiment. Participants verbally responded and this procedure ensured that the distinction between remembering and knowing was understood before the task was introduced. Participants were given a post experimental questionnaire and they were asked to indicate, by circling a number on a 5-point Likert scale ranging from (1= very easy to 5 = very hard), how easy it was to say if they 'remembered' or 'knew' the answers to the questions and to state why it was easy or hard. Feedback from all the children was examined to ascertain if they understood the difference between remembering and knowing. Ninety-seven percent of the children indicated that it was easy to differentiate between the two states of awareness. However, this feedback was not used as a measure of inclusion or exclusion in the experiment.

"It was easy because I knew if I remembered or did not remember the answer because I would be able or not to picture it." - boy 10 years.

"I remembered the answer when I could see what happened in my head." -girl 9 years.

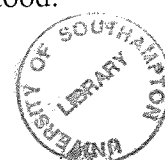
Three percent of the children stated that they were unsure about the 'remember'/'know' distinction, but this problem appeared to be due to the conceptual difficulty in differentiating between the two states of awareness rather than to the explanation given to the children during the training protocol.

"I wasn't sure about the difference between the two." - boy 9 years.

The inclusion of a 'Don't Know' option is particularly important as the legal guidelines for interviewing children set out in the *Memorandum of Good Practice* (1992) specifically states that children should always be told that saying 'I do not know' is acceptable.

Procedure

The procedure was the same as the one used in Experiment 1a, in which participants completed a self-administered cued-recall test. A practice question was included at the beginning of the memory test to ensure that the task and the instructions were understood.



Participants were given the opportunity to clarify the task before proceeding with the questionnaire. The researcher read each question to participants and allowed time for the children to respond on the questionnaire before proceeding to the next question. For each answered item on the recall test participants made three subsequent judgements (1) a confidence rating measured on a 5-point Likert scale (where 1 = not very sure, and 5 = very sure); (2) a source judgement, video or audiotape; and (3) a remember/know judgement. The order of the confidence, source and remember/know judgements was systematically varied using a Latin Square. Participants received one of three questionnaires in which the order of the judgements varied as follows: (1) remember/know, source and confidence judgements, (2) source, confidence and remember/know judgements, and (3) confidence, remember/know and source judgements. Participants were asked not to discuss the task with one another and their performance was monitored by the researcher. The memory test was completed within 1 hour and 10 minutes.

6.3 Results

Eyewitness Recall

The data analysis was identical to that used in Experiment 1a. Only the responses pertaining to the video material were analysed. The audio material facilitated source discrimination and the data were not used in the analysis. The video data were collapsed across the judgement order in the analysis. For each item on the cued-recall test responses were categorized as either accurate, inaccurate, or don't know. The responses to the questions were scored in a 'blind' fashion; that is, regardless of the type of detail reported. This was done to prevent any bias in the data analysis.

Total number of questions answered. The focus on analysing accuracy risked missing differences in the overall level of eyewitness responses. The total number of questions participants answered gives an indication of the total amount of information pertaining to an eye-witnessed event that can be recalled after a 24 hour delay. Sixteen video-related questions were asked of all 167 participants. The mean number of questions answered and (standard deviation) were 6.41 (4.16) respectively or 40 percent of what participants saw. A two-way, repeated measures Analysis of Variance (ANOVA) of the effects of retrieval state and detail to the total number of questions answered revealed a high number of responses for

questions remembered ($F(1, 180) = 144.16, MSE = 1782.45, p < .001$) and for peripheral details ($F(1, 180) = 10.42, MSE = 7.16, p < .001$). The interaction between state and detail was non-significant ($F(1, 180) < 1, MSE = .00, p > .05$). The mean (and standard deviations) for each experimental condition are summarised in the first row of the data presented in Table 6.3.1.

Number of correct responses. The mean number of questions participants correctly answered was 6.5, or 40 percent, of the 16 questions asked. A two-way, repeated measures (ANOVA) of the total number of correct responses by the state of awareness accompanying retrieval and detail type revealed that remember-based retrieval was more accurate than know-based retrieval ($F(1, 180) = 142.29, MSE = 738.07, p < .001$). There was no difference between accurate central and peripheral details ($F(1, 180) < 1, MSE = .112, p > .05$). The interaction between retrieval state and detail was non-significant ($F(1, 180) < 1, MSE = .16, p > .05$). The mean numbers of correct responses across retrieval state and detail are summarised in the second row of Table 6.3.1.

The mean number of incorrect responses for all participants is listed in the third row of Table 6.3.1. An ANOVA analysis evaluated the effects of retrieval state and detail to the mean number of incorrect responses. There were more incorrect answers remembered than known ($F(1, 180) = 55.21, MSE = 226.55, p < .001$). A high number of incorrect peripheral details was recalled ($F(1, 180) = 13.24, MSE = 9.06, p < .001$). The interaction between the two variables was non-significant ($F(1, 180) < 1, MSE = .16, p > .05$).

Table 6.3.1: *Mean number of number of questions answered, correct responses, incorrect responses and proportion accuracy across state of awareness and detail together with confidence ratings (and standard deviations).*

	Central Details		Peripheral Details	
	Know	Remember	Know	Remember
No. of questions answered	1.15 (1.68)	4.29 (2.25)	1.35 (1.93)	4.49 (2.77)
No. of correct responses	.59 (.99)	2.64 (2.09)	.60 (1.09)	2.59 (2.20)
No. of incorrect responses	.56 (1.10)	1.65 (1.54)	.76 (1.29)	1.90 (1.79)
Proportion Accurate	.54 (.40)	.67 (.31)	.49 (.42)	.67 (.32)
Confidence when accurate	3.55 (1.36)	3.50 (.99)	3.47 (.98)	3.58 (1.36)

Proportion of accurate responses. This was calculated in relation to all retrieval attempts, accurate and inaccurate. The effects of state of awareness and detail to accuracy by means of an ANOVA analysis, necessitated data in all the experimental conditions. Consequently the number of participants was reduced from 181 to 53 participants. The proportion of accurate responses was cited in the fourth row of Table 6.3.1. One consequence of leaving out participants who were not regarded as 'valid' cases in the ANOVA analysis, is that a false impression of the overall proportion of accurate central and peripheral detail responses is given. The proportion of accurate responses was calculated using the formula, the number of correct responses/total questions answered. Overall, the number of cases, the mean proportion of accurate responses and (standard deviation) were 165, .60 (.30) respectively for central details remembered; 86, .54 (.42) respectively for central details known; 155, .57 (.32) respectively for peripheral details remembered; and 95, .45 (.42) respectively for peripheral details known.

Table 6.3.1 displayed participants' accurate, inaccurate responses and confidence across state of awareness and detail. Separate analyses were conducted to investigate the effects of states of awareness and detail on the proportion of accurate responses, confidence and the CA association.

Proportion of Accurate Responses

Table 6.3.1 was based on 53 cases used in the ANOVA analysis to evaluate the effects of retrieval states and detail on the proportion of accurate responses. The proportion of accurate responses ranged from .49 to .67 ($M = .60$). The results confirmed the experimental prediction that recall accuracy is significantly higher for information remembered ($F(1, 52) = 9.95$, $MSE = 1.195$, $p < .001$) than information known. This finding was consistent with the results of Experiment 1a, when adult participants were examined. The results are important when one considers that children are regarded as less accurate than adults. Central and peripheral details were reported equally well ($F(1, 52) < 1$, $MSE = .03$, $p > .05$) and this result was at variance with the experimental prediction and the expectations of attentional focus theory. However, the result may be attributed to the overall benefits of the 'remember' retrieval state in improving accuracy for all types of detail. Evidence of this was based on the fact that the 'know' retrieval state was associated with

higher central than peripheral detail accuracy. The interaction between the state of awareness and detail was non-significant ($F(1, 52) < 1$, $MSE = .07$, $p > .05$). The effects of states of awareness and detail type to confidence are examined in the next section.

Confidence in Responses

There were insufficient cases to calculate a three-way, repeated measures ANOVA to examine the effects of state of awareness, detail type and accuracy to confidence. A two-way, repeated measures ANOVA assessed the effects of state of awareness and detail on confidence levels when responses were accurate. There was no confirmation of the experimental prediction that confidence is higher for information remembered. The data were at variance with those obtained in Experiment 1a, because confidence was equivalent for accurate details remembered and known ($F(1, 26) < 1$, $MSE = .02$, $p > .05$). Confidence was equivalent for accurate central and peripheral details ($F(1, 26) < 1$, $MSE = .0001$, $p > .05$). The interaction between the two variables was non-significant ($F(1, 26) < 1$, $MSE = .455$, $p > .05$). The mean confidence ratings for accurate responses across the experimental conditions were displayed in Table 6.3.1.

To assess the difference between confidence levels when participants accurately and inaccurately reported information, a series of one-way, repeated measures ANOVA was conducted. The mean confidence rating (and standard deviation) when participants accurately and inaccurately remembered central details were 3.79 (.99) and 2.26 (1.05) respectively. The ANOVA analysis revealed that accurate responses were expressed more confidently than inaccurate ones ($F(1, 108) = 30.14$, $MSE = 15.68$, $p < .001$). Similarly, a one-way repeated measures ANOVA was conducted in order to evaluate the difference between confidence levels when participants accurately and inaccurately reported central details they knew. The mean confidence rating (and standard deviation) when participants were accurate and inaccurate were 3.75 (1.11) and 3.60 (1.28) respectively. There was no significant difference between accurate and inaccurate responses ($F(1, 27) < 1$, $MSE = .32$, $p > .05$).

The mean confidence rating (and standard deviation) when participants accurately and inaccurately remembered peripheral details were 3.75 (.96) and 3.44 (.96) respectively. Confidence was higher when participants were accurate ($F(1, 103) = 12.83$, $MSE = 4.92$, p

< .001). However, confidence was equivalent when participants accurately and inaccurately reported peripheral details they knew ($F(1, 30) = 2.58$, $MSE = 1.27$, $p > .05$). The mean confidence rating (and standard deviation) when participants accurately and inaccurately knew peripheral details were 4.11 (1.11) and 3.83 (1.23) respectively. Overall, the data suggest that a 'remember' state of awareness is associated with higher confidence ratings in the accuracy of responses, than a 'know' state of awareness, regardless of the type of detail reported. Identical results were obtained with adult participants in Experiment 1a.

The Confidence-Accuracy Association

The confidence-accuracy relationship was examined using Goodman-Kruskal's gamma as discussed in Experiment 1a. The mean CA gamma correlations ranged from .14 to .40 ($M = .25$). One sample t-tests, as recommended by Perfect and Hollins (1996), were conducted to evaluate the significance of the mean confidence-accuracy correlation in each experimental condition from zero. Significant correlations were obtained for central details 'remembered' and peripheral details 'known'. These are displayed in Table 6.3.2.

Table 6.3.2: *Mean confidence-accuracy correlation (and standard deviation) across state of awareness and detail for child witnesses.*

	Central Details	Peripheral Details
'Know' judgements	.14 (.09)	.40 (.07)*
'Remember' judgements	.28 (.11)*	.16 (.09)

* $p < .05$, (2-tailed)

An ANOVA analysis reduces the number of valid cases so a Wilcoxon signed ranks, 2-tailed test was conducted to examine the effects of state of awareness and detail type to the strength of the CA correlation. There was no significant difference between 'remembering' and 'knowing' to the central detail CA correlation ($z = .11$, $p > .05$). The mean (and sum) of the ranks in which remembering facilitated the central detail CA correlation was 5.50 (11.00), while the mean (and sum) of the ranks in which a 'know' mental state improved the central

detail CA correlation was 2.50 (10.00). Similarly, there was no significant difference between 'remembering' and 'knowing' to the peripheral detail CA correlation ($z = 1.47$, $p > .05$). The mean (and sum) of the ranks in which remembering facilitated the peripheral detail CA correlation was 1.00 (1.00), while the mean (and sum) of the ranks in which a 'know' mental state improved the central detail CA correlation was 3.00 (9.00).

When the effect of detail type was considered, no significant difference was observed between the central and peripheral detail CA correlations reported during a 'remember' state of awareness ($z = .98$, $p > .05$). The mean (and sum) of the ranks in which the central detail CA correlation was higher than the peripheral detail CA correlation was 25.58 (767.50), while the mean (and sum) of the ranks in which the peripheral detail CA correlation was higher than the central detail CA correlation was 26.60 (558.50). There was no difference between the central and peripheral detail CA correlations reported during a 'know' state of awareness ($z = .11$, $p > .05$). The mean (and sum) of the ranks in which the central detail CA correlation was higher than the peripheral detail CA correlation was 3.67 (11.00), while the mean (and sum) of the ranks in which the peripheral detail CA correlation was higher than the central detail CA correlation was 3.33 (10.00). The results must be treated with caution because of the low number of participants in the analyses. Therefore, only the most powerful differences could be expected to show up in the data. Nevertheless, given the paucity of data in this area, the data are relevant although further research is needed with larger samples.

The relationship between states of awareness, detail and source accuracy

This series of analyses examines the complex relationship between state of awareness, source, and detail on eyewitness overall event accuracy. The proportion of accurate responses was used in all the analyses. A hierarchical multiple regression analysis was conducted to answer the question, to what extent can eyewitness accuracy be predicted from witnesses' state of awareness at retrieval (Block 1), source accuracy (Block 2) and detail type (Block 3). Event accuracy, the criterion variable, was computed as the proportion of accurate responses from total responses, both accurate and inaccurate.

The relationship between a 'remember' retrieval state, the predictor variable, and event accuracy was assessed in the following way. For each participant the proportion of

accurately remembered information, from all information remembered, was computed. In order to estimate the relationship between a second predictor variable, the 'know' retrieval state, and event accuracy, the proportion of 'know' responses that was accurate, from all information 'known,' was calculated for each participant.

The results of Block 1 indicated that 'remember' and 'know' states of awareness accounted for a significant amount of the accuracy variability $R^2 = .86$, $F(2, 108) = 323.51$, $p < .001$. The standardized regression coefficient for the 'remember' state of awareness was (.76, $p < .001$) and for the 'know' state it was (.37, $p < .001$). A second analysis was conducted to evaluate whether source accuracy predicted accuracy over and above states of awareness at retrieval. The results of Block 2 indicated that source accuracy did not contribute to the accuracy variability after controlling for the effects of state of awareness, R^2 change = .000, $F(1, 107) = .00$, $p > .05$. The standardized regression coefficient was (.00, $p > .05$). A third analysis was conducted to examine whether detail type predicted accuracy after controlling for the effects of state of awareness and source accuracy. The results showed an R^2 change = .13, $F(2, 105) = 387.85$, $p < .001$. The standardized regression coefficient was (.48, $p < .05$) for central details and (.54, $p < .05$) for peripheral details. Together the five variables explained 98 percent of the accuracy variability, $R^2 = .98$, $F(5, 105) = 1210.37$, $p < .001$. Table 6.3.3 summarised the B, standard error, beta values and the partial correlation of the predictors in each set of variables.

Table 6.3.3. Hierarchical multiple regression of predictors of accuracy

Blocks	<i>B</i>	Standard error	Beta	Partial correlations
Block 1:				
Remember	.67	.03	.76*	.89
Know	.23	.02	.37*	.69
Block 2:				
Source accuracy	-.00	.01	.00	-.00
Block 3:				
Central detail	.41	.02	.48*	.89
Peripheral detail	.46	.02	.54*	.93

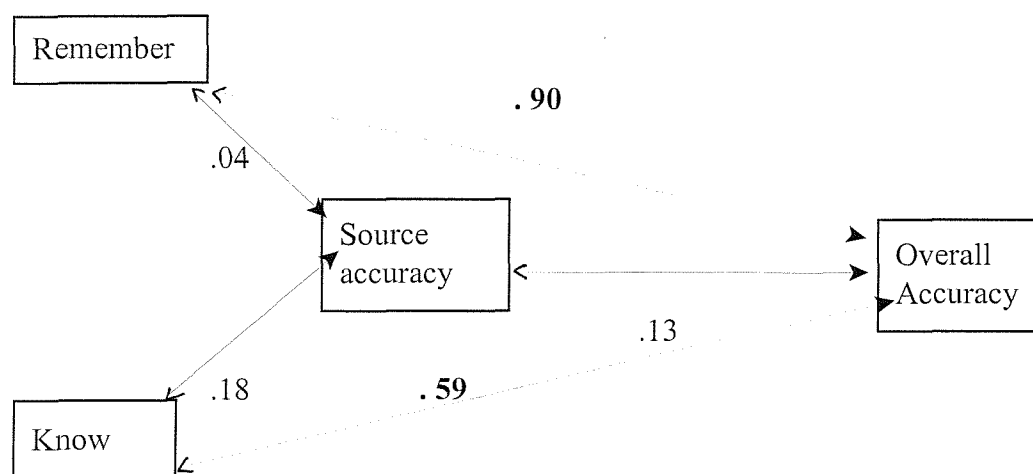
* Significant at $p < .05$.

To what extent is a 'remember' retrieval state a good predictor of (1) accuracy, and (2) source accuracy? To what extent is source accuracy a good predictor of event accuracy? These questions were addressed in a series of linear regression analyses. The results of a linear regression analysis to evaluate the prediction of accuracy from a 'remember' state of awareness at retrieval, revealed that the correlation between 'remembering' and accuracy was .90, $t(165) = 25.78$, $p < .001$. Approximately 80 percent of the variance of accuracy was accounted for by its linear relationship with a 'remember' retrieval state. The correlation between a 'know' retrieval state and accuracy was .59, $t(115) = 7.82$, $p < .001$. Thirty-four percent of the variance of accuracy was accounted for by its linear relationship with a 'know' retrieval state. Both remembering and know influenced accuracy, an indication that participants who gave 'remember' judgements perhaps also made more 'know' judgements. The sum of the two correlations was 1.49.

The second question was, to what extent is a 'remember' retrieval state a good predictor of source accuracy? The results of a linear regression analysis revealed that the correlation between 'remembering' and source accuracy was .04, $t(165) = .53$, $p > .05$. None of the variance of source accuracy was accounted for by its linear relationship with a 'remember' retrieval state. The correlation between 'knowing' and source accuracy was .18, $t(115) = 1.92$, $p > .05$. Two percent of the variance of source accuracy was accounted for by its linear relationship with a 'know' retrieval state. There was no evidence that the state of awareness at retrieval contributed significantly to source accuracy.

The third question was, to what extent is source accuracy a good predictor of event accuracy? A linear regression analysis revealed that the correlation between source accuracy and event accuracy was .13, $t(170) = 1.66$, $p > .05$, with 1 percent of the variance of accuracy being account for by its linear relationship with source accuracy. The results contradicted one of the main predictions of the SMF which states that source identification helps in retrieving the associated details that are necessary to accurately report an experience (Johnson et al., 1993). Knowledge of the source of an event facilitates accuracy because it assists in separating schematic or general knowledge from an actual experience. The path diagram displayed in Figure 6.3.4 was based on the standardized beta coefficients obtained in the series of linear analyses previously described. The diagram displays how retrieval state, memory for source and overall accuracy inter-relate.

Figure 6.3.4. Path coefficients between retrieval state, source and overall accuracy



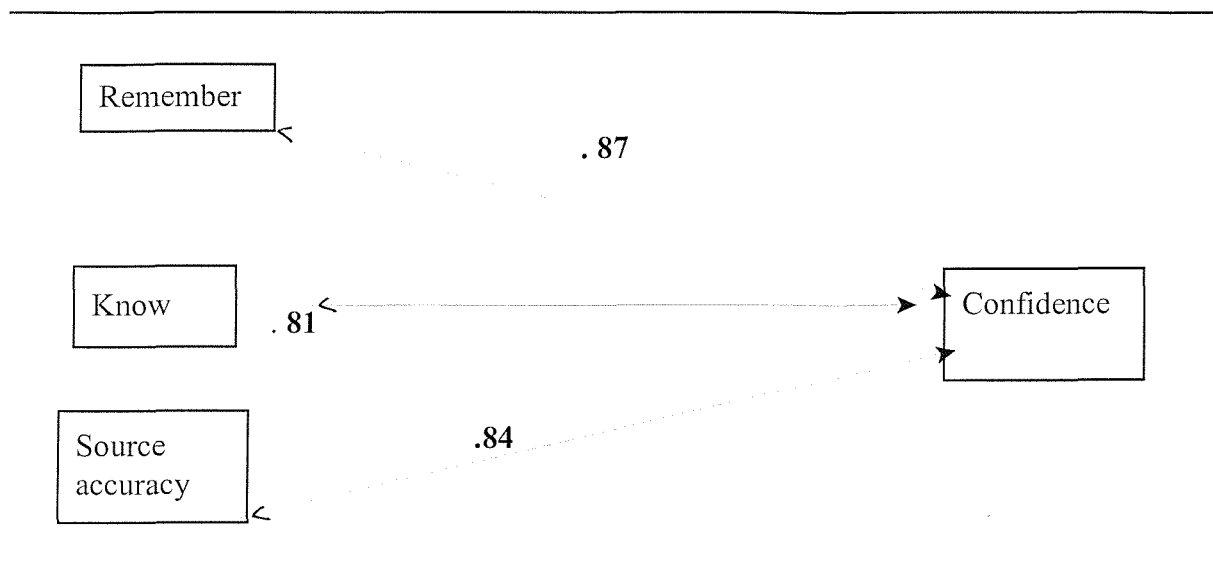
Coefficients in bold font are significant at $p < .05$.

The results of a linear regression analysis to evaluate the prediction of confidence from a 'remember' state of awareness at retrieval, revealed that the correlation between 'remembering' and confidence was $.87$, $t(153) = 22.19$, $p < .001$. Approximately 76 percent of the variance of confidence was accounted for by its linear relationship with a 'remember' retrieval state. The correlation between a 'know' retrieval state and confidence was $.81$, $t(81) = 12.26$, $p < .001$. Sixty-five percent of the variance of confidence was accounted for by its linear relationship with a 'know' retrieval state. It appears that remembering and knowing contributed to confidence in performance, and the sum of the beta coefficients was 1.68.

To what extent is source accuracy a good predictor of confidence in memory? A linear regression analysis revealed that the correlation between source accuracy and confidence was $.84$, $t(163) = 19.57$, $p < .001$, with 70 percent of the variance of confidence being account for by its linear relationship with source accuracy. The path diagram displayed in Figure 6.3.5 was based on the standardized beta coefficients obtained in the series of linear analyses previously described. The diagram displays how retrieval state,

memory for source and confidence inter-relate.

Figure 6.3.5 Path coefficients between retrieval state, source and confidence



Coefficients in bold font are significant at $p < .05$.

6.4 Discussion

Experiment 2a was a replication of Experiment 1a, with children. Flavell (1999) emphasised the importance of explaining what children know about their mental states and how they relate these mental states to behaviour. In response to Flavell's mandate, this study investigated the confidence-accuracy association for children's eyewitness memory. This relationship was evaluated for the central and peripheral details of an eye-witnessed event. The data confirmed the results of Experiment 1a obtained with adult participants and extended the benefits of remember-based recollections to child witnesses. One of the advantages of applying the remember/know procedure with children is the possibility of separating false beliefs from lying. Incorrect responses were remembered and known so children genuinely believed that they had a memory of the details they reported. The following discussion is divided into two main areas and each area is discussed separately. The first sub-section outlines the relationship between mental states at retrieval and the CA association, and in the second section the relationship between mental states and accurate source monitoring is summarised.

The relationship between mental states at retrieval and the CA association

Recall accuracy

Before the reliability of children's memory monitoring is examined using evidence from the strength of their confidence-accuracy correlations, the link between retrieval state and accuracy as well as retrieval state and confidence are considered. In the introduction to this experiment mention was made of the pre-requisites outlined by Poole and Lindsay (1998) regarding the reliability of children's testimony. One pre-requisite was that children must realise that the interviewer wants them to report only from personal experience. The data offered more robust support of the importance of remembering to recall accuracy across age groups and detail types. The results extended Toplis's findings with word-recall, to eyewitness recall. The research demonstrated that children are capable of reporting both the central, salient details of their observations as well as the background, peripheral details, when they remember events. Batterman-Faunce and Goodman (1993) reported similar results and the data from Experiment 2a offered a more positive view of children's competence than studies reporting age-related difference in peripheral detail recall (Cassel & Bjorklund, 1995; Poole & White, 1991), or children's difficulty in defining their experiences (Ackerman, 1994).

The proportion of accurate responses across all experimental conditions in the present study was (.59) for children's recall compared to (.62) for adult recall so children did not perform worse than adults. Prior research confirms that performance on cued-recall tasks approaches adult levels by the age of 8 years (Lepore, 1991) and there is no significant age effect between adults and older children's ability to report colour related information (Ling & Blades, 1996). In Experiment 2a children's performance was modest after a 24 hour delay and the low accuracy rate may be due to children reliance on scripted knowledge to answer questions. When children are asked to remember a past experience, their recall is a mixture of script information and particular episodic details (Farrar & Boyer-Pennington, 1999). For example, children displayed a greater tendency than the adults in Experiment 1a to report the black handcuffs shown in the video-clip as a pair of *silver* handcuffs.

An examination of Table 6.3.1 revealed that the number of incorrect responses, commission errors, was higher for information remembered than known. This occurred for both central and peripheral details. The data patterned those obtained with adult recall

(Experiment 1a). The important result relates to the proportion of accurate responses which was significantly higher for responses remembered than known. In light of the mandate to identify methods of discriminating between accurate and inaccurate reports (Poole & Lindsay, 1998), the remember/know procedure emerges as an important method for discriminating recall accuracy with both adults and children.

Confidence

Flavell (1999) claimed that research is needed to understand how children relate mental state to behaviour. The ANOVA data indicated that children were as confident in their accurate remember-based recollections as their accurate know-based judgements. Similarly, there was no effect of detail type to confidence. The first finding was consistent with the view that the familiarity of an event associated with knowing makes information more accessible and this ease of retrieval could be mistaken for remembering (Kelley & Lindsay, 1993). Another analysis revealed some support for the benefits of remembering to confidence in performance. Accurate central and peripheral details judged to be remembered at retrieval, were more confidently expressed than inaccurate central and peripheral details that were remembered. In contrast, there was no difference in the level of confidence with which accurate and inaccurate central and peripheral details were known. The data suggest that a remember state of awareness can assist children to filter out correct from incorrect knowledge, and this is reflected in the confidence with which the information is subsequently reported. Overall, the results remain important because studies that evaluated children's recall accuracy do not consider how states of awareness at retrieval contribute to confidence in performance (e.g., Toplis, 1997).

The confidence-accuracy association

Significant CA correlations for peripheral details known and central details remembered were obtained, but there was no significant effect of retrieval state or detail type to the magnitude of the CA correlation.

The relationship between remember/know states of awareness and source monitoring

The source monitoring framework (SMF) identifies better source discrimination during a

'remember' than a 'know' state of awareness at retrieval. Developmentalists believed that children's source monitoring skills depend on factors in addition to the age of the child. The linear regression analysis revealed that a remember state of awareness at retrieval was a weak predictor of source accuracy. This result was inconsistent with the core ideas of the SMF but the data were identical to that obtained with adult witnesses (Experiment 1a). The explanation given in Experiment 1a has the same relevance for the present study. It is easier for participants to be source-accurate when given an immediate than a delayed memory test (Dodson & Johnson, 1996). It appeared to be more difficult for children to remember the source of their central and peripheral detail memories following a 24-hour retention interval. Children can remember content details sufficiently to answer questions but they may fail to recognise the time and place those events occurred (Newcombe & Siegal, 1997). This explanation is plausible given that children were more accurate when they reported information they remembered than knew.

The SMF also assumes that the ability to identify the origins of ones' mental experiences is associated with the accurate recall of the contents of the remembered event. Once again source accuracy was unrelated to children's content accuracy, a replication of the results obtained with adult participants (Experiment 1a). Dissociations between content and source accuracy follow long retention intervals and Powell and Thompson (1997) reported that children's source accuracy decline independently from their content accuracy after a delay of 1-6 weeks in reporting events.

Conclusion

At the beginning of the chapter it was noted that there was an urgent need for improved methods of discriminating between accurate and inaccurate allegations (Poole & Lindsay, 1998) because when children believe what they are reporting, it is difficult to detect errors (Bruck et al., 1998). Poole and Lindsay said that the reporting of personal experience and source accuracy were essential pre-requisites for children's accuracy. The remember/know procedure was used to assess the phenomenological experiences underlying children's reports. Specifically, the study examined the mental states of awareness accompanying retrieval and detail type as two cognitive factors that are responsible for recall accuracy and

the confidence-accuracy relationship. There was support for one of the experimental predictions; information remembered was significantly more accurate than information known, regardless of the type of detail reported. Thus children were capable of reporting their personal experience and filtering out information that was familiar. The advantage of a remember state of awareness at retrieval did not influence confidence or confidence-accuracy resolution. The data provided evidence that children possess one of the two pre-requisites for providing reliable testimony (Poole & Lindsay, 1998).

There are limitations of the present study. The experiment was based on a cognitive model to explain children's accuracy. However, the reliability of children's memories is susceptible to social influences. Even if children can remember an event as well as adults and they are capable of efficient memory or source monitoring, children are likely to comply with the suggestions of adults in authority (Warren & Lane, 1995). This was avoided to some degree by group-testing children because it reduces compliance to the authority figure of an interviewer. Nevertheless, children easily 'remember seeing' details suggested by authority figures so the social dynamics underlying the confidence-accuracy relationship merit future investigation.

The proportion of children's recall accuracy across the experimental conditions was modest, marginally lower than that of adults. Perhaps this modest performance was due to the fact that participants were questioned on specific aspects of the stimulus event, (e.g. How many men on bicycles chased the hero and the woman?) It is generally acknowledged that overall accuracy is higher for free-recall than cued recall (Toplis, 1997; Tulving, 1985). Hence the questioning format may in part explain the proportion of recall accuracy obtained. The next experiment examines the influence of states of awareness and detail to children's initial non-recollective memory, but prospective feeling of knowing accuracy.

CHAPTER SEVEN

Experiment 2b: Exploring the Relationship between Children's States of Awareness and the Confidence-Accuracy Relationship for Feeling of Knowing Judgements

"The theme of metacognition is inextricably related to problems of awareness. It is necessary to determine how the mind may actually deploy effective metacognitive abilities"

(Lories et al., 1998, p.13)

7.1 Introduction

Experiment 2b was a replication of Experiment 1b, with children aged 9-10 years. Adults in Experiment 1b gave an equivalent amount of FOK judgements, in relation to don't know responses, to unanswered central and peripheral detail questions. The mean predictive accuracy was (.52) across the experimental conditions and this was higher than chance level (.25). Predictive accuracy was statistically significant for central details participants judged to be 'known' than 'remembered' at retrieval. The mean FOK-CA correlation across the experimental conditions was (.41) and a significant correlation of (.72) was obtained for peripheral details 'known'. According to Lories et al. (1998), metacognition is interlinked with awareness. The present study examined how children's awareness of information that was not spontaneously recalled, was stored in memory. To date, children's prospective memory and the link between their FOK judgements and performance have been evaluated in an educational context (Pressley, Levin, Ghatala & Ahamad, 1987b; Pressley & Ghatala, 1989; Efklides, Petropoulou & Samara, 1999). These findings are useful to establish predictions regarding the reliability of children's prospective memory in a forensic context, and to understand the memory monitoring skills of 9-10 year olds. The present study responds to claims that a fruitful approach to the study of memory monitoring in child witnesses is to combine the study of 'feeling of certainty' and 'feeling of knowing' (Sykes et al., 1988).

The trace-based view, cue-familiarity hypothesis, accessibility hypothesis, and the dual-process framework, attempt to explain the origins of FOK's and to predict the reliability of FOK beliefs in prospective memory. These models were outlined in Chapter Three and the data obtained in Experiment 1b matched the explanation given by the accessibility

hypothesis (Koriat, 1993) and the dual-process framework (Koriat & Levy-Sadot, 1999). There is some evidence that children's FOK judgements are based on information accessibility. Marche (1999) examined the memories of young children and noted that the strength of the memory trace may be responsible for the recovery of memory when the activation of some features of a trace spreads to other features. This finding was consistent with the data derived with adults (Experiment 1b), in which predictive accuracy was statistically significant for central details 'known'.

Research reveals that children aged 9-10 years possess good memory monitoring skills in estimating judgements of learning. Consequently, this age group was also expected to show similar skills in their FOK judgements for eyewitness memory. Pressley et al. (1987b) examined prospective performance on a vocabulary test with children 6-8 and 9-10 years. This study revealed that older children were more accurate in estimations of their performance than younger children. In a similar study Pressley and Ghatala (1989) examined memory monitoring using a picture-word vocabulary test with three age groups 7, 9 and 13 year olds. A hard or an easy test was administered and Pressley and Ghatala found that 13 year olds accurately estimated their performance on the easy test, but they overestimated their performance on the hard test. The younger age groups did not overestimate or underestimate their performance. Pressley and Ghatala concluded that young children show a lack of awareness about their test performance but older children have more cognitive insight about their knowledge. Efklides et al. (1999) also concluded that task difficulty influences judgements of learning, including confidence in performance. Children 13-14 years were presented with two mathematical tasks varying in complexity along a 'hard'/'easy' dimension, and confidence was high when the task was judged to be 'familiar' and 'easy'.

The finding that the degree of difficulty of a task influences beliefs about future performance is relevant because it forms the basis of the 'cue familiarity' explanation for FOK judgements and predictive accuracy. The 'cue familiarity' hypothesis suggests that FOK judgements are based on how much people think they know about a particular domain of knowledge (Metcalf et al., 1993), and this FOK is triggered by the cues present in the question (Reder & Ritter, 1992). Given this argument, and the data presented by Marche (1999), it is expected that children's FOK judgements may be sensitive to the type of detail reported. Specifically, central detail events may be associated with stronger memory traces

and these are likely to trigger more FOK judgements than don't know responses, to unanswered central detail questions.

The experiments reviewed examined predictive accuracy immediately after learning. In contrast, the present study examines predictive accuracy for an eyewitnessed event shown 24 hours earlier. The study takes the existing research one step forward by assessing the effects of state of awareness and detail type to FOK judgements, predictive accuracy, confidence in recognition, and the FOK-CA association. The predictions were identical to those stated in Experiment 1b.

7.2 Method

Design

The experimental design was identical to the one used in Experiment 2a.

Participants

The data for this study were collected in Experiment 2a; consequently, the participants were the same as those in Experiment 2a. They retained the same group to which they were randomly assigned on the basis of information type and presentation order, to the four groups described in Experiment 1a.

Materials

The stimulus material was identical to that used in Experiment 2a.

Questionnaire

The questionnaire was identical to that used in Experiment 1b. The instructions used in the present study were the same as those administered in Experiment 2a, with the exception that participants were not required to make a feeling of knowing judgement.

Procedure

As in Experiment 2a the researcher read each question to ensure that the participants understood the questions and the nature of the task. Immediately after completing the cued-recall test (Experiment 2a) participants were given the recognition test. Participants circled an answer or the don't know option. For each item on the recognition test that was answered

participants made three subsequent judgements. A rating of confidence based on perceived accuracy and measured on a 5-point Likert scale (where 1 = not very sure, and 5 = very sure). A source judgement to identify the source of the answer, video or audiotape was obtained. Participants also identified their state of awareness accompanying the retrieval of answers based on the definitions of 'remembering' and 'knowing'. The order of the confidence, source and remember/know judgements was varied using a Latin Square. After participants responded on the questionnaire, the researcher proceeded to the next question until the memory test was completed. Participants were told not to discuss the task with one another and they were monitored by the researcher and the class teacher during completion of the questionnaire. The recognition test was completed within 50 minutes.

Predictions

The predictions were based on the literature reviewed in this study as well as the results obtained with adults (Experiment 1b). Specifically, the strong memory traces underlying central detail events were expected to trigger more FOK judgements in response to unanswered central detail questions than peripheral detail ones. Additionally, FOK accuracy and the FOK-CA association were based on 'knowing' (Experiment 1b), so the generalizability of this result was evaluated in the present study with children.

7.3 Results

Feeling of knowing Judgements

The data were coded and analysed in the same way as in Experiment 1b. The analysis focusses on two main issues (1) the effect of detail type on the proportion of 'feeling of knowing' judgements, and (2) the effect of state of awareness and detail type on the proportion of accurate FOK responses, confidence in recognition accuracy, and FOK-CA reliability. The proportion of FOK responses, proportion of FOK accuracy, and confidence in recognition memory are summarised in Table 7.3.1.

The Proportion of Feeling of Knowing Judgements

The proportion of FOK judgements was computed from the number of FOK judgements in relation to the number of unanswered questions (FOK plus Don't know responses). The

mean proportion of FOK responses and (standard deviation scores) for central and peripheral details were 0.19 (.34) and 0.13 (.30) respectively. The results of a two-tailed, paired-samples t-test revealed more FOK judgements to unanswered central detail questions than peripheral detail ones ($t(84) = 2.34, p < .05$).

Table 7.3.1: *Proportion of feeling of knowing (FOK) responses, confidence when accurate and inaccurate across state of awareness and detail type (and standard deviations).*

	Central Details		Peripheral Details	
	Know	Remember	Know	Remember
Proportion Accurate FOK	.42 (.14)	.57 (.17)	.55 (.15)	.18 (.13)
Confidence Accurate FOKs	4.33(.15)	4.25 (.53)	2.40(.40)	3.50 (.35)
Confidence Inaccurate FOKs	2.25 (.42)	3.44 (.30)	2.63 (.17)	3.44 (.12)

Proportion of Feeling of Knowing Accuracy

The proportion of FOK accuracy was calculated from the correct recognition answers/the correct and incorrect recognition answers given in this study, in response to the FOK judgements given in Experiment 2a. The number of valid cases in each experimental condition was as follows; central details ‘remembered’ (n=17), central details ‘known’ (n=11), peripheral details ‘remembered’ (n=11) and peripheral details ‘known’ (n=10). The proportion of accurate responses ranged from .18 to .57 across the experimental conditions ($M = .43$). A Wilcoxon signed ranks test was used to examine the effects of state of awareness at retrieval and detail type to FOK accuracy. There were insufficient cases to assess the effect of state of awareness to central detail FOK accuracy. There was no significant difference between ‘remembering’ and ‘knowing’ to FOK accuracy for peripheral details ($z = 1.34, p > .05$). The mean (and sum) of the ranks in which ‘remembering’ accompanied FOK accuracy was 0.00 (.00) and the mean of the ranks in which a ‘know’ state of awareness was associated with FOK accuracy was 1.50 (3.00).

The effect of detail type to FOK accuracy was examined and the results of a Wilcoxon signed ranks test revealed no significant difference between central and peripheral detail FOK accuracy during a ‘remember’ retrieval state ($z = 1.00, p > .05$). The mean (and

sum) of the ranks in which central detail FOK accuracy was higher was 1.00 (1.00) while the mean of the ranks in which peripheral detail FOK accuracy was higher was 0.00 (0.00). Similarly, there was no significant difference between central and peripheral detail FOK accuracy during a 'know' retrieval state ($z = .45$, $p > .05$). The mean of the ranks in which central detail FOK accuracy was higher was 1.00 (1.00) while the mean of the ranks in which peripheral detail FOK accuracy was higher was 2.00 (2.00). Given the lack of participants in some of the experimental conditions only the most powerful differences could be expected to show up in the data. The results need to be replicated with larger samples of individuals before they can be accepted.

Confidence in Accurate Feeling of Knowing Responses

The number of valid cases across the experimental conditions was as follows; central details 'remembered' ($n=8$), central details 'known' ($n=6$), peripheral details 'remembered' ($n=6$) and peripheral details 'known' ($n=5$). The mean confidence for FOK accurate responses and (standard deviations) across state of awareness and detail were reported in Table 7.3.1. There were insufficient cases to assess the effects of state of awareness and detail type to confidence using a Wilcoxon signed ranks test.

FOK-Confidence-Accuracy Association

The FOK-CA gamma correlation was computed using the procedure discussed in Experiment 1b. The mutually exclusive nature of the 'remember'/'know' procedure reduced the number of valid cases across the experimental conditions. FOK-CA correlations were obtained for three of the four experimental conditions, and these are displayed in Table 7.3.2. The correlations ranged from .01 to .28 ($M = .18$) and a one sample t-test of the means revealed that they were all non significant.

Table 7.3.2: *Mean FOK-CA gamma correlations (and standard deviations) across state of awareness and detail type for adult witnesses.*

	Central Details	Peripheral Details
'Know' judgements	-	.01 (.24) (n = 5)
'Remember' judgements	.25 (.17) (n = 3)	.28 (.25) (n = 6)

7.4 Discussion

This study was a replication of Experiment 1b, with children 9-10 years. It is difficult to compare the results of Experiment 1a with the present study, because some of the analyses could not be computed due to insufficient cases. However, the data are relevant because it represents the first study, to date, of the reliability of children's FOK experiences, to eyewitness memory. The emphasis was on the role of detail type to FOK judgements, and the association between the state of awareness at retrieval and (1) predictive accuracy, (2) confidence in recognition memory, and (3) the FOK-CA association. The discussion focusses on each of these issues in turn.

FOK judgements

Children had more FOK experiences when they were unable to answer central detail questions, than peripheral detail ones, a confirmation of the experimental hypothesis. The proportion of FOK judgements was computed in relation to the 'do not know' responses, so children appeared to have some partial knowledge of the answer (Koriat, 1993), based on the familiarity of the cues in the question (Libert & Nelson, 1998; Reder & Ritter, 1992), and the strength of the memory trace (Cowan, 1998; Marche, 1999). Cowan argues that the cues in a question can supplement partial verbatim traces which along with some gist memory trigger FOK experiences. In contrast, there was no effect of detail type on FOK judgements with adults (Experiment 1b).

States of awareness and FOK predictive accuracy

The main purpose of the study was to evaluate the effects of the state of awareness at

retrieval and detail type to FOK predictive accuracy. The data indicated that the state of awareness at retrieval and detail type were unrelated to children's predictive accuracy. The experimental prediction was unsupported and varied from the results obtained with adults (Experiment 1b). Nevertheless, the data offered an insight into children's prospective memory for eyewitness information. They performed above the chance level (.25) in three of the experimental conditions; central details 'known', central details 'remembered', and peripheral details 'known'. This showed that 9-10 year olds possessed good memory monitoring skills, of the accessibility and availability of information, even in the absence of spontaneous recall.

The mean proportion of accurate FOK responses ($M = .43$) was higher than the proportion of accurate responses of (.31) reported by Perfect and Hollins (1996) for adult eyewitness memory. However, it was also lower than the mean proportion of accurate responses ($M = .52$) obtained with adults (Experiment 1b). The reliability of children's predictive performance has previously been shown with judgements of learning in an educational context (e.g. Pressley et al., 1987b; Pressley & Ghatala, 1989). The present data extend our knowledge of children's FOK accuracy to a forensic setting. The results also disproved claims that feeling of knowing judgements do not predict subsequent recognition performance for eyewitness memory (Perfect & Hollins, 1999).

It is relevant that although more FOK's were given for unanswered central details, predictive accuracy was unrelated to detail type. The data are consistent with other evidence that the variables that assist metamemory, the FOK decision, do not always facilitate accuracy (Wider Jr. & Smith, 1996). Theorists claim that this pattern in the data is not surprising because FOK's are based on an inference generated from, among other factors, the salience of the cues in the target question or the retrieval of related target events (Koriat, 1993, 1995; Reder & Ritter, 1992). The dissociation between FOK decision and FOK accuracy occurs because first, in the FOK task the decision component is separate from the retrieval component (Lories et al., 1999). Koriat (1995) explains that FOK judgements depend on the mere quantity of information accessibility without due regard to its correctness. So both correct and incorrect information may come to mind when deciding if an answer to a question is unknown or stored in memory.

Second, related episodic information may prompt FOK decisions and trigger

intersections in memory (Reder, 1987), although this related knowledge may not contain the target answer. Third, the possibility that participants choose the FOK alternative, not because they have a genuine FOK experience, but because of a reluctance to admit a lack of knowledge cannot be ignored (Wider, Smith & Graziano, 1996). So some FOK judgements reflect what a participant, particular a child, feels he or she is expected to know, rather than what this person actually knows (Costermans, Lories & Ansay, 1992). In summary, FOK predictive accuracy depends on the correctness of the information that is retrieved. For issues of accuracy, access to the target information is critical (Leibert & Nelson, 1998) along with familiarity with cues present in the answer.

The FOK confidence-accuracy relationship

There were insufficient cases to evaluate the effects of state of awareness and detail type to confidence in recognition memory, and to the FOK-CA association. Further research is therefore needed to assess if these two variables influence performance. The FOK-CA correlations were not significant when a one-sample t-test of the mean was computed. The mean FOK-CA correlation across the experimental conditions was ($M = .18$), and this was lower than similar data obtained with adults (Experiment 1b). However, the mean correlation was higher than the FOK-recognition gammas of (.10) and (.08) reported by Perfect and Hollins (1996) and Perfect and Hollins (1999, Experiment 1) respectively. These studies measured eyewitness memory after a 24 hour delay with adults.

Conclusion

This experiment was important because what is generally understood about children's prospective memory has been gleaned from studies about their predictive performance in an educational context. The main findings were that children made more FOK decisions for unanswered central detail questions and predictive accuracy, in general, was reliable and above chance performance. The main limitation of this study related to the small number of participants present in the experimental conditions. This limitation was redressed in Experiment 4b by manipulating retrieval state with a pre-test retrieval instruction as a between-subjects variable. The next experiment investigates the relationship between retrieval state to accuracy, confidence and the CA when a recognition test is administered.

CHAPTER EIGHT

Experiment 2c: The Relationship between States of Awareness, Confidence-Accuracy Judgements and Source Monitoring Accuracy for Children's Delayed Recognition

"Conscious awareness of recognition seems to take a least two distinctive forms ... some specific experience [or] feelings of familiarity." (Gardiner & Parkin, 1990, p. 579)

8.1 Introduction

Gardiner and Parkin's comment that recognition occurs on the basis of conscious awareness and familiarity, is shared by other memory theorists (Haist et al., 1992; Jacoby & Dallas, 1981; Mandler, 1980; McElree et al., 1999). The data derived from adult participants (Experiment 1c) revealed that information judged to be 'remembered' and 'known' at retrieval were equally accurate. However, confidence in the accurate recognition of peripheral details 'known' was higher than central details 'known', and this led to better CA resolution for peripheral details acquired through 'knowing'. So while recognition accuracy was facilitated by Tulving's 'remember' and 'know' retrieval states, insights into metamemory (measured by confidence and the CA association) appeared to be based on knowing that an event occurred, rather than knowledge of specific details acquired through remembering.

Recognition is regarded as being less dependent on contextual, associated details than recall (Raaijmakers & Shiffrin, 1992), and children's performance in the previous experiments reported in this thesis followed this pattern. Children's recall accuracy was higher during a 'remember' than a 'know' retrieval state (Experiment 2a), but their FOK recognition accuracy was unaffected by the state of awareness at retrieval (Experiment 2b). The present study examines how the state of awareness at retrieval contributes to two important memory monitoring skills in children; confidence-accuracy processing and source monitoring. The experiment tests the robustness of the results obtained in Experiment 1c, with 9-10 year olds. A key issue addressed is the relationship between memory for source and event memory, as there is conflicting evidence about the nature of this association for children's recognition memory. The literature review outlines the reliability of children's recognition memory with particular reference to the strength of the CA association and

source monitoring accuracy. Predictions are made about children's recognition accuracy and CA judgements for the central and peripheral details of an eyewitnessed event.

One of the first reported studies of the reliability of children's CA judgements examined recognition memory (Sykes et al., 1988). Eight and 10 year olds were exposed to a live event lasting less than 1 minute, and 6 questions relating to the descriptions of clothing worn by the persons in the 'event' were asked. Memory was evaluated immediately and 1 week later using a three-alternative forced-choice test. Confidence was evaluated using three categories 'absolutely certain', 'not sure' and 'don't know'. The data revealed that children were equally accurate on the immediate and delayed recognition tests, although they were surprisingly more confident on the delayed test. Sykes et al. reported significant CA correlations (r) of $-.49$ and $-.45$ for the immediate and delayed recognition tests respectively. Such negative CA associations indicate that children were overconfident in their memory. The study is relevant because it offers an insight into children's ability to match confidence and accuracy. The present experiment improves on the study by Sykes et al. by asking children to identify their state of awareness at retrieval and the source of their knowledge. This encourages memory monitoring, and a 'remember' retrieval state was expected to strengthen the CA association and facilitate source-accuracy. It is widely believed that combining a source task with a recognition task increases response accuracy, than the use of a recognition task (Johnson, 1997).

8.2 Source monitoring and recognition accuracy

The SMF explains why source monitoring improves memory for the details of an event. Source identification involves making a decision about the origins of one's knowledge and this is determined by the quality of the memory (e.g., visual clarity, degree of detail, level of conscious awareness). The 'remember' retrieval state described by Tulving (1985) assists source identification (Johnson et al., 1996), and Toplis (1997, Experiment 2) reported that 8-12 years olds were more source accurate when they 'remembered' than 'knew' the answers to questions asked. There are, however, some conditions in which children find source monitoring difficult when it is combined with a recognition task. The accurate identification of source material is reduced with delay (Ackil & Zaragoza, 1995), while immediate testing seems to inoculate 10 year olds against source confusion (Parker, 1995).

In the present study memory was evaluated 24 hours after an event was presented to participants, but in the legal system this 24-hour period does not constitute a lengthy delay. So it was expected that children would be able to ‘remember’ the source of their knowledge.

There are also some contradictions between the predictions contained in the SMF and children’s performance on a recognition task. Parker (1995) reported that the recognition data obtained from 8 year olds did not match the pattern of the source monitoring scores. This was taken as evidence of an independence between recognition and source monitoring because both processes did not tap into the same cognitive processes. Other studies concluded that recognition and source discrimination judgements relied on similar information, and that 12 year olds are efficient in accurately locating the origin of their information (Day, Howie & Markham, 1998). The present study continues to assess the relationship between states of awareness at retrieval to accuracy, confidence and the CA association, with a recognition task. Given the inconclusive evidence about the association between source accuracy and event memory identified in the literature, this was examined in the current experiment.

8.3 Predictions and method

The study examined the contribution of remember/know mental states and detail to recognition accuracy, confidence and the confidence-accuracy relationship. Given the results of Experiment 2a on children’s recall and the evidence outlined in the literature review, it was anticipated that improvements to accuracy and the confidence-accuracy relationship would accompany remember-based memory. The effects of detail type to accuracy and the CA association were also examined and the prediction was for more accurate and better CA resolution for central detail events. As in Experiment 2a, the mental state underlying source accuracy and the relationship between source accuracy and overall content accuracy were evaluated.

Method

Design

The experimental design was identical to that used in Experiment 2a.

Participants

One hundred and thirty-nine children were shown the stimulus material but 132 of them (62 girls, 70 boys) ranging in age from 9-10 years, ($M = 9$ years, 2 months), completed the two phases of the study. They were recruited from two schools in Southampton, Springhill Catholic Primary School and Ludlow Junior School. Participants were randomly assigned on the basis of information type and presentation order to one of the four groups described in Experiment 1a. Gender of the participants was balanced as far as possible across the groups.

Materials

To-be-remembered event

The stimulus was identical to the one used in Experiment 2a, and the questionnaire was identical to that used in Experiment 1b.

Instructions

The instructions were identical to that used in Experiment 2b.

Procedure

The procedure was identical to the one used in Experiment 2b, in which participants completed a recognition test. As in Experiment 2b, the researcher read each question to ensure that the question and the nature of the task were understood. Participants circled an answer or the 'don't know' option. For each answered item on the recognition test participants made three subsequent judgements (1) a confidence rating measured on a 5-point Likert scale (where 1 = not very sure, and 5 = very sure); (2) a source judgement, video or audiotape; and (3) a remember/know judgement. The order of the confidence, source and remember/know judgements was systematically varied using a Latin Square. Participants received one of three questionnaires in which the order of the judgements varied as follows: (1) remember/know, source and confidence judgements, (2) source, confidence and remember/know judgements, and (3) confidence, remember/know and source judgements. Participants were asked not to discuss the task with one another and their performance was monitored by the researcher. The memory test was completed within 45 minutes.

8.4 Results

Eyewitness Recognition

The data were analysed as outlined in Experiment 1c and only the responses pertaining to the video material were used. The audio material facilitated source discrimination and the data omitted from the analysis. The video data were collapsed across the judgement order in the analysis. For each item on the cued-recall test responses were categorized as either accurate, inaccurate, or don't know. The responses to the questions were scored in a 'blind' fashion; that is, regardless of the type of detail reported. This was done to prevent any bias in the data analysis.

Total number of questions answered. The focus on analysing accuracy risked missing differences in the overall level of eyewitness responses. Computation of the total number of questions participants answered would give an indication of the total amount of information pertaining to an eye-witnessed event that can be recalled after a 24 hour delay. Sixteen video-related questions were asked of 132 participants. The mean number of questions answered and (standard deviation) were 8.03 and (2.97). Children recognised 50 percent of what they saw, 10 percent more than they were able to recall in Experiment 2a. A two-way, repeated measures Analysis of Variance (ANOVA) of the effects of retrieval state and detail to the total number of questions answered revealed a high number of responses for questions remembered ($F(1, 131) = 62.03, MSE = 1140.49, p < .001$) and for peripheral details ($F(1, 131) = 6.24, MSE = 2.46, p < .025$). The interaction between the two variables was also significant ($F(1, 1) = 7.77, MSE = 14.67, p < .025$). Subsequent analysis of the simple main effects, using a paired samples, 2-tailed t-test, revealed that the total number of peripheral detail questions recognised was higher than the total number of central detail questions recognised during a 'know' retrieval state ($t(131) = -3.75, p < .001$). However, the number of peripheral and central recognised during a 'remember' retrieval state did not differ ($t(131) = 1.43, p > .05$). The interaction is illustrated in Figure 8.4.1 and the means and (standard deviations), derived from the ANOVA analysis, are summarised in the first row of the data presented in Table 8.4.2.

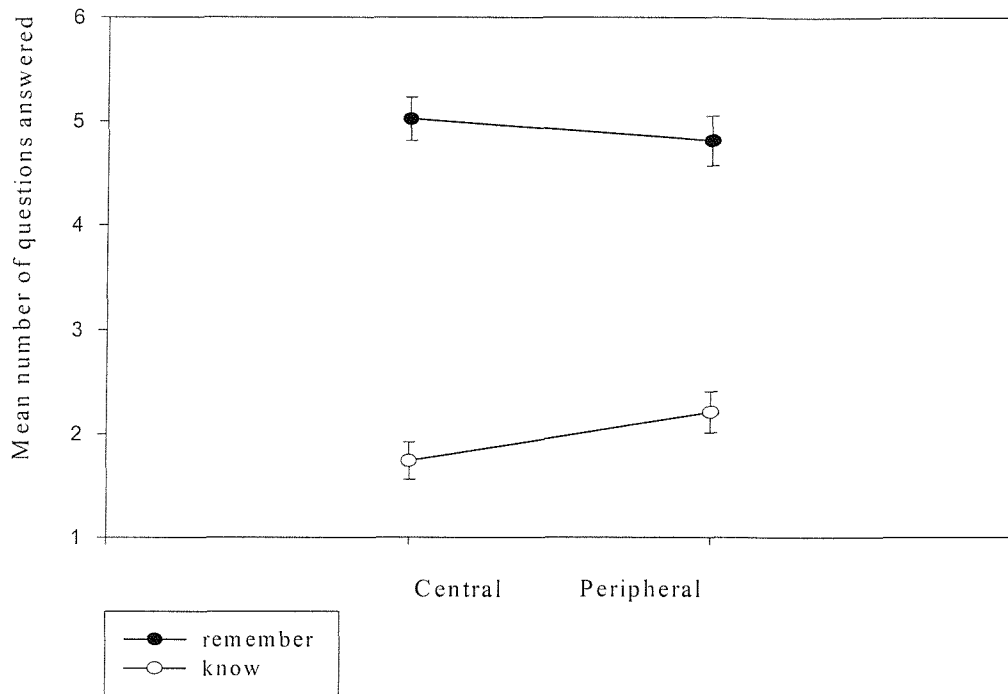


Figure 8.4.1: The interaction between retrieval state and detail on the mean number of questions answered, with standard error bars.

Table 8.4.2: Mean number of number of questions answered, correct responses, incorrect responses and proportion accuracy across state of awareness and detail together with confidence ratings (and standard deviations).

	Central Details		Peripheral Details	
	Know	Remember	Know	Remember
No. of questions answered	1.74 (2.05)	5.02 (2.45)	2.21 (2.34)	4.82 (2.70)
No. of correct responses	1.09 (1.55)	2.86 (1.75)	1.17 (1.5)	2.92 (2.02)
No. of incorrect responses	.65 (1.01)	2.16 (1.64)	1.05 (1.39)	1.90 (1.56)
Proportion Accurate	.54 (.35)	.60 (.30)	.59 (.36)	.59 (.34)
Confidence when accurate	3.95 (1.15)	3.76 (1.08)	3.64 (1.38)	3.61 (1.19)

Number of correct responses. The mean number of questions participants correctly answered was 8, or 50 percent, of the 16 questions asked. A two-way, repeated measures

(ANOVA) of the total number of correct responses by retrieval state and detail type revealed that remembering led to more accurate responses than knowing ($F(1, 131) = 52.18$, $MSE = 407.76$, $p < .001$). There was no difference in the number of accurate peripheral and central detail responses ($F(1, 131) < 1$, $MSE = .61$, $p > .05$). The interaction between retrieval state and detail was non-significant ($F(1, 131) < 1$, $MSE = .07$, $p > .05$). The mean numbers of correct responses across retrieval state and detail, derived from the ANOVA analysis, were summarised in the second row of Table 8.4.2.

The mean numbers of incorrect responses, derived from the ANOVA analysis, for all participants were listed in the third row of the data in Table 8.4.2. Remembering was associated with more incorrect responses than knowing ($F(1, 131) = 44.35$, $MSE = 184.36$, $p < .001$). Detail type did not influence the number of incorrect answers ($F(1, 131) < 1$, $MSE = .61$, $p > .05$). However, the interaction between the two variables was significant ($F(1, 131) = 13.20$, $MSE = 14.01$, $p < .001$) and this is displayed in Figure 8.4.3.

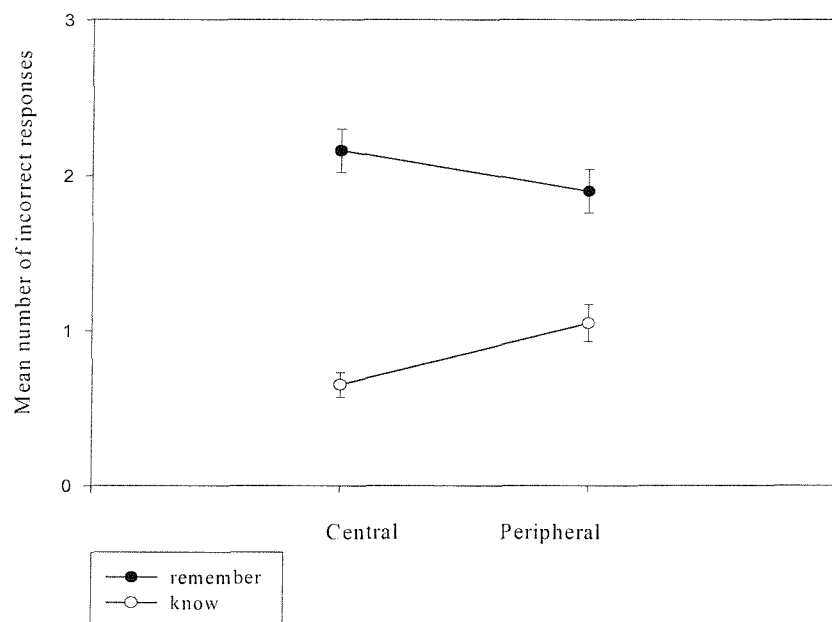


Figure 8.4.3: Interaction between retrieval state and detail on the mean number of incorrect responses, with standard error bars.

Subsequent analysis of the simple main effects, using a paired samples, 2-tailed t-test,

revealed that the difference between central and peripheral detail incorrect responses was greater for information known ($t(131) = -3.93$, $p < .001$) than remembered ($t(131) = 1.99$, $p < .05$).

Proportion of Accurate responses. The proportion of accurate responses was calculated in relation to all retrieval attempts, accurate and inaccurate. The effects of state of awareness and detail on accuracy by means of an ANOVA analysis, necessitated data in all the experimental conditions. Consequently the number of participants was reduced from 132 to 62. The proportion of accurate responses, derived from the ANOVA analysis, was cited in the fourth row of Table 8.4.2. An overview of the pattern of results revealed no difference to recognition accuracy for remembered-based and know-based retrieval. One consequence of excluding participants in the ANOVA analysis is that a false impression of the overall proportion of accurate central and peripheral detail responses is given. The proportion of accurate responses was calculated using the formula, the number of correct responses/total questions answered. Overall, the number of cases, the mean proportion of accurate responses and (standard deviation) were 129, .60 (.27) respectively for central details remembered; 80, .61 (.37) respectively for central details known; 123, .61 (.28) respectively for peripheral details remembered; and 84, .51 (.38) respectively for peripheral details known.

In the following section separate analyses were conducted to investigate the effects of states of awareness and detail the proportion of accurate responses, confidence and the confidence-accuracy relationship.

Proportion of Accurate Responses

The proportion of accurate responses ranged from .54 to .60 ($M = .58$) and the mean was marginally lower than the one reported in Experiment 2a. Analysis of the proportion of accurate responses by means of a two-way, repeated measures ANOVA, confirmed that recognition accuracy was equivalent during remember and know retrieval ($F(1, 61) < 1$, $MSE = .015$, $p > .05$). There was no support for the experimental prediction. However, the pattern of results was identical to that obtained with adult participants (Experiment 1c). There was no evidence of better memory for salient, central events because central and

peripheral details were reported equally accurately ($F(1, 61) > 1$, $MSE = .025$, $p > .05$).

The interaction between the two variables was non significant ($F(1, 61) < 1$, $MSE = .010$, $p > .05$).

Confidence in Responses

There were insufficient cases to calculate a three-way, repeated measures ANOVA to examine the effects of state of awareness, detail and accuracy to confidence. Therefore a two-way, repeated measures ANOVA examined the effects of state of awareness and detail to confidence in accurate responses. The data were inconsistent with the experimental prediction, but identical to those obtained in Experiment 1c. 'Remember' and 'know' states of awareness were associated with equivalent confidence ratings ($F(1, 37) < 1$, $MSE = .481$, $p > .05$). Confidence was also equivalent for central and peripheral details ($F(1, 37) = 2.7$, $MSE = 2.042$, $p > .05$). The interaction between the two variables was non significant ($F(1, 37) < 1$, $MSE = .252$, $p > .05$).

To assess the difference between confidence levels when participants accurately and inaccurately reported information, a series of one-way, repeated measures ANOVA was conducted. The mean confidence rating (and standard deviation) when children accurately and inaccurately remembered central details were 3.91 (.87) and 3.39 (1.08) respectively. The ANOVA analysis revealed that accurate responses were expressed more confidently than inaccurate ones ($F(1, 96) = 35.69$, $MSE = 13.14$, $p < .001$). Similarly, a one-way repeated measures ANOVA was conducted in order to evaluate the difference between confidence levels when participants accurately and inaccurately reported central details they knew. The mean confidence rating (and standard deviation) when participants were accurate and inaccurate were 3.97 (1.33) and 3.64 (1.30) respectively. There was no significant difference between accurate and inaccurate responses ($F(1, 36) = 2.82$, $MSE = 2.04$, $p > .05$).

The mean confidence rating (and standard deviation) when participants accurately and inaccurately remembered peripheral details were 4.00 (.90) and 3.74 (.99) respectively. Confidence was higher when participants were accurate ($F(1, 89) = 7.91$, $MSE = 2.98$, $p < .025$). However, confidence was equivalent when participants accurately and inaccurately reported peripheral details they knew ($F(1, 41) = 4.00$, $MSE = 1.90$, $p > .05$). The mean

confidence rating (and standard deviation) when participants accurately and inaccurately knew peripheral details were 4.00 (1.29) and 3.70 (1.19) respectively. Overall, remembering was associated with an increase in confidence, regardless of the type of detail recognised. Conversely, inaccurate details remembered were expressed with less confidence. The results were identical to those obtained for children's recall (Experiment 2a). In contrast, a know retrieval state did not lead to an adjustment in confidence rating when information was accurately and inaccurately reported.

The Confidence-Accuracy Association

The CA association was examined using Goodman-Kruskal's gamma as discussed in Experiment 1a. The mean correlations ranged from .06 to .42 ($M = .30$). One sample t-tests were conducted to evaluate the significance of the mean correlation in each experimental condition, from zero. Significant correlations were obtained for central details 'remembered' and 'known'. These are displayed in Table 8.4.4.

Table 8.4.4: *Mean confidence-accuracy correlation (and standard deviation) across state of awareness and detail.*

	Central Details	Peripheral Details
'Know' judgement	.42 (.12)*	.28 (.18)
'Remember' judgement	.42 (.09)*	.06 (.12)

* $p < .05$, 2 tailed.

An ANOVA analysis reduces the number of valid cases so a Wilcoxon signed ranks, 2-tailed test was conducted to examine the effects of state of awareness and detail to the strength of the CA correlation. There was no significant difference between a 'remember' and a 'know' retrieval state to the central detail CA correlation ($z = .85$, $p > .05$). The mean (and sum) of the ranks in which remembering facilitated the central detail CA correlation was 4.80 (24.00), while the mean (and sum) of the ranks in which a 'know' mental state improved the central detail CA correlation was 4.00 (12.00). Similarly, there was no significant difference between the two retrieval states to the peripheral detail CA correlation ($z = .81$, $p > .05$). The mean (and sum) of the ranks in which remembering facilitated the peripheral detail CA

correlation was 2.25 (4.50), while the mean (and sum) of the ranks in which a 'know' mental state improved the central detail CA correlation was 3.50 (10.50).

There was a significant difference between the central and peripheral detail CA correlations reported during a 'remember' state of awareness ($z = 3.20$, $p < .05$). The mean (and sum) of the ranks in which the central detail CA correlation was higher than the peripheral detail CA correlation was 25.71 (900.00), while the mean (and sum) of the ranks in which the peripheral detail CA correlation was higher than the central detail CA correlation was 21.23 (276.00). Remembering was associated with an increase in the strength of the CA correlation for central than peripheral details. This is displayed in Figure 8.4.5.

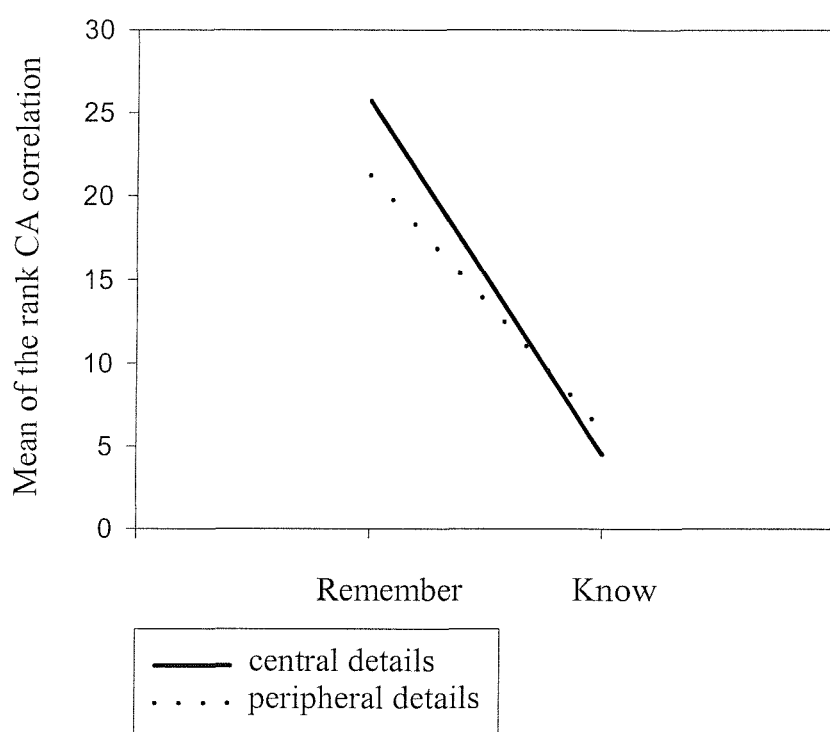


Figure 8.4.5. The effects of states of awareness and detail type to the CA correlation.

The data displayed in Figure 8.4.5. varied from those obtained with children's recall (Experiment 2a) and adult recognition (Experiment 1c). In these experiments detail type had

no significant effect on the magnitude of the CA correlation.

There was no difference between the central and peripheral detail CA correlations reported during a 'know' state of awareness ($z = .54$, $p > .05$). The mean (and sum) of the ranks in which the central detail CA correlation was higher than the peripheral detail CA correlation was 4.50 (27.00), while the mean (and sum) of the ranks in which the peripheral detail CA correlation was higher than the central detail CA correlation was 6.00 (18.00).

The relationship between states of awareness, detail and source accuracy

This series of analyses examines the complex relationship between state of awareness, source, and detail on accuracy. The proportion of accurate responses was used in all the analyses. A hierarchical multiple regression analysis was conducted to answer the question, to what extent can eyewitness accuracy be predicted from witnesses' state of awareness at retrieval (Block 1), source accuracy (Block 2) and detail type (Block 3). Event accuracy, the criterion variable, was computed as the proportion of accurate responses from total responses, both accurate and inaccurate. The relationship between a 'remember' retrieval state, the predictor variable. Event accuracy was assessed for each participant using the proportion of accurately remembered information, from all information remembered. In order to estimate the relationship between a second predictor variable, the 'know' retrieval state, and event accuracy, the proportion of 'know' responses that was accurate, from all information 'known,' was calculated for each participant.

The results of Block 1 indicated that 'remember' and 'know' states of awareness accounted for a significant amount of the accuracy variability $R^2 = .75$, $F(2, 89) = 133.98$, $p < .001$. The standardized regression coefficient for the 'remember' state of awareness was (.67, $p < .001$) and for the 'know' state it was (.43, $p < .001$). A second analysis was conducted to evaluate whether source accuracy predicted accuracy over and above states of awareness at retrieval. The results of Block 2 indicated that source accuracy did not contribute to the accuracy variability after controlling for the effects of state of awareness, R^2 change = .007, $F(1, 88) = 2.66$, $p > .05$. The standardized regression coefficient was (.09, $p > .05$). A third analysis was conducted to examine whether detail type predicted accuracy after controlling for the effects of state of awareness and source accuracy. The results showed an R^2 change = .23, $F(2, 86) = 895.78$, $p < .001$. The standardized regression

coefficient was (.56, $p < .05$) for central details and (.57, $p < .05$) for peripheral details. Together the five variables explained 98 percent of the accuracy variability, $R^2 = .99$, $F(5, 86) = 1534.40$, $p < .001$. Table 8.4.6 summarised the B, standard error, beta values and the partial correlation of the predictors in each set of variables.

Table 8.4.6. Hierarchical multiple regression of predictors of accuracy

Blocks	B	Standard error	Beta	Partial correlations
Block 1:				
Remember	.50	.03	.67*	.80
Know	.25	.04	.43*	.65
Block 2:				
Source accuracy	.19	.11	.09	.17
Block 3:				
Central detail	.46	.02	.56*	.96
Peripheral detail	.49	.02	.57*	.96

* Significant at $p < .05$.

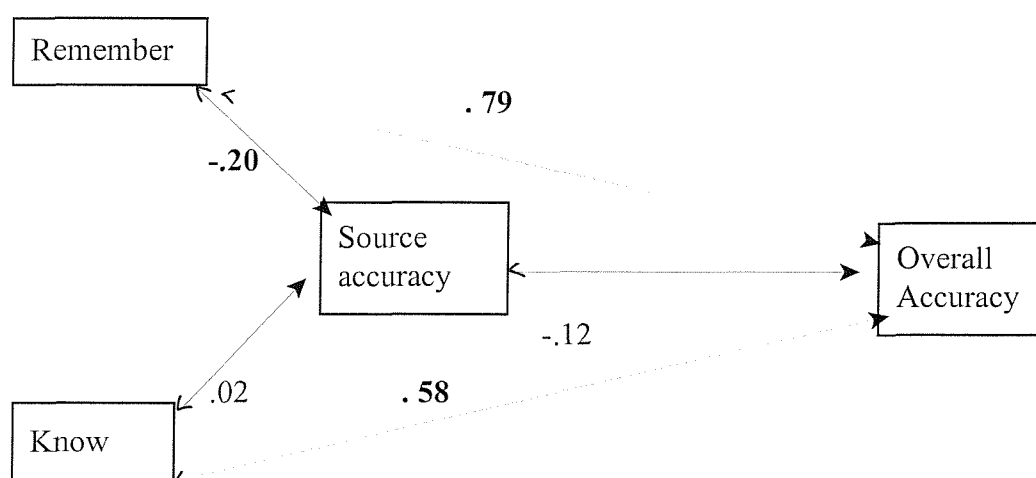
To what extent is a 'remember' retrieval state a good predictor of (1) accuracy, and (2) source accuracy? To what extent is source accuracy a good predictor of event accuracy? These questions were addressed in a series of linear regression analyses. The results of a linear regression analysis to evaluate the prediction of accuracy from a 'remember' state of awareness at retrieval, revealed that the correlation between 'remembering' and accuracy was .79, $t(165) = 14.77$, $p < .001$. Approximately 63 percent of the variance of accuracy was accounted for by its linear relationship with a 'remember' retrieval state. The correlation between a 'know' retrieval state and accuracy was .58, $t(92) = 6.83$, $p < .001$. Thirty-three percent of the variance of accuracy was accounted for by its linear relationship with a 'know' retrieval state. In response to the first question, remember and know states contributed significantly to recognition accuracy. Participants who remembered information were also likely to know other items of information. The two beta coefficients totalled 1.37.

To what extent is a 'remember' retrieval state a good predictor of source accuracy? The results of a linear regression analysis revealed that the correlation between

‘remembering’ and source accuracy was $-.20$, $t(128) = -2.31$, $p < .05$. Three percent of the variance of source accuracy was accounted for by its linear relationship with a ‘remember’ retrieval state. The correlation between ‘knowing’ and source accuracy was $.02$, $t(92) = .21$, $p > .05$. One percent of the variance of source accuracy was accounted for by its linear relationship with a ‘know’ retrieval state. In response to the second question, a remember state of awareness was associated with a decrease in source accuracy.

The third question was, to what extent is source accuracy a good predictor of event accuracy? A linear regression analysis revealed that the correlation between source accuracy and event accuracy was $-.12$, $t(130) = -1.32$, $p > .05$, with none of the variance of accuracy being account for by its linear relationship with source accuracy. The results contradicted the primary claim of the SMF that source identification helps in retrieving the specific details of an event. The path diagram displayed in Figure 8.4.7 was based on the standardized beta coefficients obtained in the series of linear analyses previously described. The diagram displays how retrieval state, memory for source and overall accuracy inter-relate.

Figure 8.4.7. Path coefficients between retrieval state, source and overall accuracy



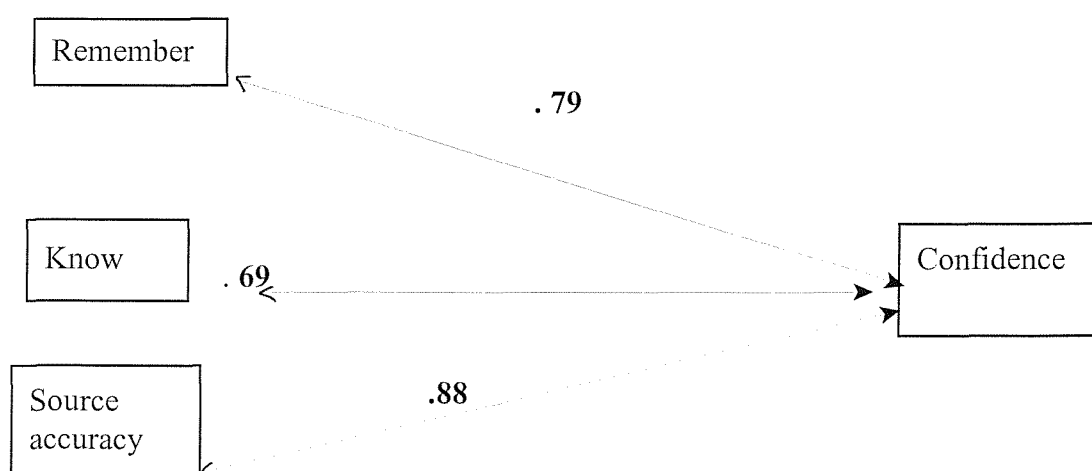
Coefficients in bold font are significant at $p < .05$.

The results of a linear regression analysis to evaluate the prediction of confidence from a ‘remember’ state of awareness at retrieval, revealed that the correlation between

'remembering' and confidence was $.79$, $t(123) = 14.38$, $p < .001$. Approximately 62 percent of the variance of confidence was accounted for by its linear relationship with a 'remember' retrieval state. The correlation between a 'know' retrieval state and confidence was $.69$, $t(73) = 8.17$, $p < .001$. Forty-seven percent of the variance of confidence was accounted for by its linear relationship with a 'know' retrieval state. In response to the first question, both 'remember' and 'know' states of awareness at retrieval boosted eyewitness confidence. The coefficients together summed to $.74$.

The second question was, to what extent is source accuracy a good predictor of confidence in memory. A linear regression analysis revealed that the correlation between source accuracy and confidence was $.88$, $t(129) = 12.61$, $p < .001$, with 77 percent of the variance of confidence being account for by its linear relationship with source accuracy. The path diagram displayed in Figure 8.4.8 was based on the standardized beta coefficients obtained in the series of linear analyses previously described. The diagram displays how retrieval state, memory for source and confidence inter-relate.

Figure 8.4.8 Path coefficients between retrieval state, source and confidence



Coefficients in bold font are significant at $p < .05$.

8.5 Discussion

This experiment examined the underlying mental origins of recognition accuracy and strong

confidence-accuracy associations. The source monitoring accuracy for the central and peripheral details of an eye-witnessed event was evaluated on a recognition task following a 24 hour retention interval. The emphasis on children's source monitoring skills related to claims inherent in the source monitoring framework that a remember state of awareness at retrieval represents implicit source monitoring. Developmental psychologists found that children are not worse than adults in accurately identifying the origins of their memories, but differences appear only under certain conditions (Day et al., 1998). The main finding was that unlike recall accuracy (Experiment 2a), children's recognition accuracy and their confidence in performance were not dependent upon the state of awareness at retrieval. The implications of this result for confidence-accuracy resolution are elaborated upon. The discussion highlights two specific areas; the relationship between mental states at retrieval and the reliability of the confidence-accuracy association; and the relationship between mental states and source monitoring efficiency.

The relationship between mental states at retrieval and the CA association

Recognition accuracy

The reliability of the CA relationship depends upon improvements to each component of the relationship, accuracy and confidence separately. The proportion of accurate recognition responses ranged from .54 to .60 across all experimental conditions so there was no ceiling effect. Mean performance was .58 and above chance performance (.25). Contrary to the experimental prediction in which remember-based memory was expected to be more accurate, recognition accuracy was equivalent for know and remember-based retrieval. The results varied from other recognition studies modelled after the remember/know procedure. Eight and twelve year olds were more accurate when recognising toys and words during a remember than a know state of awareness at retrieval (Toplis, 1997). However, the present data were identical to the results obtained with adult participants (Experiment 1c). The present data supported claims that the accuracy of recognition may be irrelevant to retrieval ease (Koriat, 1993) and that the nature of a recognition task involving item discrimination is assisted by both familiarity and recollection (Jacoby et al, 1993). Contrary to the experimental prediction that memory for central, salient events are more accurately reported, central and peripheral details were reported equally accurately.

Although the main measure of performance was on the proportion of accurate responses, a remember retrieval state benefited some aspects of memory. For example, remembering reduced the effect of detail type on the total number of details reported, while knowing did not. Specifically, a remember retrieval state was associated with an equivalent number of central and peripheral responses. Moreover, the number of correct responses was higher when the information was remembered than known. Additionally, there was a greater difference between the number of incorrect central and peripheral detail responses during a know than a remember retrieval state. These results are relevant because one limitation of remember/know studies is the emphasis on accuracy, to the exclusion of overall performance. It is hoped that the results of this study contribute to a more comprehensive understanding of how remember/know retrieval states facilitate different aspects of memory.

It is surprising that recognition accuracy was modest when one considers that recognition is an easier task than recall. An examination of children's inaccurate responses on the recognition task revealed errors of *transference*. For example, the woman in the film clip was wearing a white blouse and a blue skirt but children reported that she was wearing a blue blouse and a white skirt. Transference errors reveal a general familiarity of events. There were other reasons why children were inaccurate and one comment corresponds to the gist/verbatim explanation outlined in fuzzy-trace theory. Errors occur when memory is based on gist and there is a decay of verbatim (Brainerd & Reyna, 1998a).

"I was more interested in the story but not the detail." - boy 9 years.

The alternative answers on a recognition test constitute post-event information that could be easily implanted if participants do not have clear recollection of events. For example, the police officers shown in the film clip waved truncheons at the chasers. One of the alternative responses was 'guns' and many children reported that they remembered that the policemen waved guns at the chasers. There is further evidence that source confusion possibly contributed to recognition errors,

"Some of the questions were hard for me and I got mixed up with the video and the audio-tape." - girl 10 years.

Confidence

Children were equally confident when they accurately reported information they

remembered and they knew. This result was inconsistent with Tulving's prediction that remembered-based recognition is expressed with more confidence than familiarity-based recognition. The data diverged from other recognition studies modelled after the remember/know procedure (Toplis, 1997). Although some children reported that they were more sure of their answers when they 'pictured it in their heads', participants relied on other indicators, such as the time it took to answer the question, as an indicator of the certainty of their knowledge.

" When I answered the question very fast I was very sure. " - girl 10 years.

Thus confidence was based on both recollection and familiarity of the eye-witnessed event. Similarly, confidence was equivalent for both central and peripheral details. A relevant finding was that a remember state assisted participants to discriminate between correct and incorrect information and to adjust their confidence accordingly. This occurred regardless of the type of detail reported. Conversely, there was no difference in confidence ratings between accurate and inaccurate central and peripheral details known.

The confidence-accuracy relationship

The focus of this experiment was to identify the conditions under which children's confidence-accuracy predictions were reliable when a recognition task was administered. The mean CA gammas ranged from .06 to .42 ($M = .30$). The state of awareness at retrieval was unrelated to the strength of the CA correlation. In contrast, adults gave more reliable CA judgements to peripheral details they 'knew' than 'remembered' when they recognised the answers (Experiment 1c). The state of awareness at retrieval was also unrelated to the strength of the CA correlations obtained for children's recall (Experiment 2a).

There was, however, an effect of detail type on the CA correlations obtained from remember-based recognition by children. Specifically, the central detail CA correlation was higher than the peripheral detail CA correlation. So there is some support for the prediction that memory monitoring is sensitive to the centrality of the events reported. In contrast, there was no effect of detail type on the reliability of CA judgements during children's recall (Experiment 2a).

The relationship between remember/know state of awareness and source monitoring

It is important to evaluate children's source monitoring efficiency on a recognition task for several reasons. First, the feedback from the participants in Experiment 2c revealed that errors were partially due to source mis-attributions in the descriptions of persons and related actions. Second, the process of remembering has been described as implicit source monitoring (Hyman et al., 1998) so it was expected that a remember retrieval state would facilitate source discrimination. The linear regression data confirmed that remembering was significantly related to source accuracy; however, it reduced rather than increased source accuracy as predicted by the SMF and demonstrated by Toplis (1997, Experiment 2). It is possible that when children 'remembered' source-information after the 24-hour delay, they re-experienced a related portion of the film clip, rather than the target detail. Source accuracy was unrelated to children's recognition and recall accuracy (Experiment 2a). However, the association between source accuracy and recognition accuracy was a negative one.

Conclusion

The main purpose of this study was to examine if the state of awareness underlying children recognition retrieval determines response accuracy, confidence and the reliability of the CA association. Consistent with the recognition results obtained with adults (Experiment 1c), and memory theorists (Haist et al., 1992; Gardiner & Parkin, 1990; Jacoby & Dallas, 1981; Mandler, 1980; McElree et al., 1999), recognition accuracy and confidence were facilitated by both knowing and remembering events. Children were better able to match confidence and accuracy for central than peripheral details they remembered. So although the ability to accurately recognise information is not dependent upon the quality of the experience accompanying retrieval, remembering together with the strength of the memory trace influence CA resolution.

The use of recognition tests for obtaining information from children has been criticised in a legal code of practice, *The Memorandum of Good Practice* (1992), which states that the use of recognition-type questions should be minimized. Interviewers do not initially possess all the details of an incident and new information can be easily introduced by the alternative answers on a recognition test. However, *The Memorandum of Good*

Practice also acknowledges that after a child gives a free recall report of events, an interviewer may want to clarify what that child said. For example, did the thief steal a purse or some money? The data from this recognition study did not phrase questions in a leading manner. A sample question is, what was the colour of the handcuffs shown in the film? This was followed by four alternative answers and a 'don't know' response. Asking participants to identify a suspect from among a line-up of individuals is another example of the use of a recognition test in the legal system. Nevertheless, the data from this study are valuable because when a recognition test is administered, children are equally accurate in reporting the central and peripheral details of an eye-witnessed event. More importantly, children's ability to match their confidence and accuracy judgements was better for central than peripheral details remembered at retrieval. In general, the data from this study confirmed the results of Experiment 1c obtained with adults. The data provided more robust support that although recognition accuracy relies less on contextual effects and more on item discrimination, confidence-accuracy resolution is still better when context is provided though a 'remember' state at retrieval and stronger, central detail memory traces. Chapter Nine reviews the results obtained in Experiments 2a, 2b and 2c.

CHAPTER NINE

Overview of Experiments 2a, b and c

This series of experiments broke new ground by examining how the mental state at retrieval and detail facilitate children's confidence-accuracy judgements pertaining to their eyewitness memories. The strength of the confidence-accuracy relationship was examined for recollective recall (Experiment 2a), recognition memory (Experiment 2c), and non-recollective, feeling of knowing experiences (Experiment 2b). The data are valuable on two accounts. First, the results extended previous findings with children (Toplis, 1997) in which a 'remember' retrieval state improved word-recall, to improvements in eyewitness accuracy. Second, the findings outlined exactly how a remember retrieval state improves eyewitness memory and the conditions under these benefits are likely to occur. This discussion focusses on the following issues; the role of states of awareness to the confidence-accuracy relationship; the contribution of state of awareness to source monitoring accuracy; and the confidence-accuracy association for predictive feeling of knowing judgements.

9.1 States of awareness and the confidence-accuracy relationship

Recall

Each component of the CA association was examined separately. Consistent with the experimental predictions, the ability to remember an event, as opposed to merely knowing it, improves performance in several ways. The quantity of information reported, measured as the total number of questions answered, was high. Similarly, the number of correct answers was higher for remember than know-based retrieval. The proportion of accurate responses was higher when answers were remembered than known. These findings were identical to those obtained with adults (Experiment 1a). The primary components of remembering, awareness of a personal experience, mental reinstatement and recollection of contextual details, outlined in the remember/know model, facilitated memory in the ways previously described. The results of Experiment 2a were consistent with claims that contextual cues facilitate children's memories (Gee & Pipe, 1995; Priestly & Pipe, 1999). Reporting personal experiences improves accuracy (Poole & Lindsay, 1998; Quas et al., 1999) by reducing 'guess' responses and encouraging children to admit when they lack an answer.

Experimental research with children revealed that central detail memory is more accurate than peripheral detail memory (Cassel & Bjorklund, 1995; Gobbo, 2000; Poole & White, 1991). The present study demonstrated that the total number of details recalled as well as the number of correct details recalled, were higher for peripheral than central details. However, there was no effect of detail type to the proportion of accurate responses.

There were also benefits to confidence when retrieval was accompanied by a remember state of awareness. Although confidence in accurate responses was unaffected by the state of awareness at retrieval or the type of detail reported, remembering assisted children to discriminate between correct and incorrect information and to assign an appropriate confidence rating. Specifically, participants were more confident when they accurately remembered central and peripheral detail answers, and less confident when they inaccurately remembered these central and peripheral details. In contrast, there was no difference in the confidence with which accurate and inaccurate details were expressed when they were known. The data were consistent with similar research with 8 year olds in which confidence was higher for remember-based recollections, than knowledge that was known (Toplis, 1997, Experiment 1).

It is interesting that remembering was associated with an increase in the proportion of accurate responses, but it had no significant effect on perceived confidence when responses were accurate. The complexity of eyewitnessed events compared to word-recall (e.g. Toplis, 1997), may explain the differences in the data. The results of Experiment 2a suggest that the factors that influence accuracy do not always influence confidence, a claim made by Leippe (1980). This is one reason why confidence-accuracy processing may be inefficient and produce weak correlations.

Neither the state of awareness at retrieval nor the type of detail reported produced more reliable CA correlations. However, significant CA correlations were obtained for central details 'remembered' and peripheral details 'known'. The value of using the remember/know procedure to examine how children arrive at their confidence-accuracy judgements resides in the fact that this procedure can potentially separate genuine beliefs from lies. Although children were more accurate when they remembered events, their inaccurate reports were classified as details remembered or known. Such judgements, in addition to a 'don't know' option, indicated that children either had a sense of familiarity

with, or a genuine re-experiencing of the events they reported.

Recognition

Recognition is an easier task than recall (Mandler, 1980) so children's meta-memory skills were assessed on a recognition task. The data revealed that the proportions of accurate responses remembered and known were equivalent. There were higher numbers of correct and incorrect details remembered than known. Children's recollective experiences were not associated with an improvement in recognition memory, in the same way as it assisted their recall (Experiment 2a). The findings were similar to those obtained with adults (Experiment 1c). Two reasons were offered for the results; first, the alternative answers on the recognition test functioned as cues to retrieval; and second, familiarity with the alternative answers was adequate to discriminate old from new items on the memory test (McElree et al., 1999). Thus recognition accuracy is facilitated by knowing and remembering information (Haist et al., 1992; Jacoby & Dallas, 1981; Mandler, 1980; McElree et al., 1999).

(Toplis, 1997) reported that children's recognition memory improves with the ability to remember events. Although the proportion of accurate responses was unaffected by retrieval state, the number of central and peripheral details reported was equivalent for remember based retrieval. In contrast, more peripheral than central details were reported when the information was known. So the effect of detail type is reduced by the ability to remember an event. Additionally, the presence of contextual cues in the alternative answers on the recognition test may explain why central and peripheral details were recognised equally accurately.

Confidence in accurate responses was unrelated to the retrieval state and the type of detail reported. However, confidence was higher for accurately remembered central and peripheral details, than inaccurately remembered ones. There was no difference in the confidence with which accurate and inaccurate central and peripheral details were known. Taken together the data from Experiments 2a and 2c suggest that confidence in accurate and inaccurate recall and recognition memory do not vary during a know retrieval state.

The experimental prediction was for an overall improvement in confidence-accuracy resolution for remember-based recollections. There was no effect of retrieval state on the

magnitude of the CA correlation for either central or peripheral details. However, remembering was associated with an increase in the strength of the CA correlation for central than peripheral details. There was no difference between the central and peripheral detail CA correlation during a know retrieval state. Although the benefits of remembering are assumed to increase overall memory (e.g. Tulving, 1985), the recognition data displayed a selected benefit to the memory monitoring process underlying a CA judgement. Remembering facilitated central detail CA resolution, support for the view that memory monitoring efficiency is linked to trace strength (Koriat, 1993). The results of the recognition study are particularly relevant because an earlier study by Sykes et al. (1988) reported negative, but significant CA correlations. In contrast the positive, significant CA correlation obtained for central detail memory is an indication of the reliability of children's CA judgements.

9.2 States of awareness and source monitoring

The state of awareness at retrieval was unrelated to source accuracy, despite theoretical predictions that a 'remember' retrieval state is associated with mental context reinstatement and this increases source monitoring efficiency (Johnson et al., 1993, Johnson, 1997). This result may also explain why only 1 percent of the variation associated with accuracy was due to its linear relationship with source accuracy. Some researchers report that participants experience difficulty in remembering source material after a delay and source accuracy is higher with immediate testing (Dodson & Johnson, 1996). A worrying result for the credibility of children's testimony is that when children accurately identified the source of their knowledge, this boosted confidence in event accuracy. However, source accuracy was not statistically related to event accuracy.

A different pattern of results was obtained for recognition memory. Remembering was significantly related to source accuracy; however, the association was a negative one. Remembering was associated with a decrease in source accuracy. The explanation offered by Dodson and Johnson (1996) regarding the difficulties of remembering an event after a delay, may account for the data. Source accuracy did not improve event recognition accuracy,

although it boosted confidence in recognition memory. This was identical to the results obtained for children's recall.

Most source monitoring studies conducted with children conclude that remembering improves source monitoring efficiency and leads to accurate source identification for words and objects (Toplis, 1997). This series of experiments illustrated how the ability to 'remember' the details of an eyewitnessed event may not have the predicted effects outlined in the SMF, to event accuracy or source accuracy. Consequently, source accuracy is not a good predictor of event accuracy. Another way of interpreting the results is to say that children's memory for source and memory for content were dissociated, similar conclusions were made by Parker (1995). The data contributed to the remember/know, source monitoring, and eyewitness memory literature by providing an insight into the strengths and weaknesses of children's memory monitoring and source monitoring skills, as well as some of the conditions under which source monitoring is likely to fail.

9.3 States of awareness and Feeling of Knowing (FOK) Predictive Accuracy

In addition to the memory monitoring that accompanies the identification of the retrieval state underlying one's memories, there is another type of memory monitoring that continues when information cannot be spontaneously recalled. The failure to recall information, can in some situations, result in a feeling of knowing that the target information is available and that it can be accessed by other means, such as a recognition test. Children gave more FOK judgements in response to unanswered central detail questions than unanswered peripheral ones. The stronger memory traces underlying central, salient events may be responsible for this result. In contrast, adults gave an equivalent proportion of FOK responses to unanswered central and peripheral detail questions. The influence of the familiarity or salience of a cue in triggering FOK judgements is discussed in the 'cue familiarity' hypothesis (Metcalf et al., 1993), accessibility hypothesis (Koriat, 1993; 1995) and dual-process (Koriat & Levy-Sadot, 1999) theories

Children's FOK mean predictive accuracy across all experimental conditions was ($M = .43$), with chance performance at (.25). The mean proportion of accurate responses

obtained with adults was ($M = .52$). Both sets of data dispelled the notion that eyewitness feeling of knowing judgements are not a reliable indicator of prospective recognition memory (Perfect & Hollins, 1999). A novelty of the study was the computation of the FOK-CA correlation, while most FOK studies compute a FOK-recognition correlation (Perfect & Hollins, 1996; Perfect & Hollins, 1999). In computing the FOK-CA correlation, unanswered questions that trigger an FOK judgement and are subsequently recognised, are evaluated to determine if accurate recognition is expressed more confidently than incorrect recognition. A one sample t-test of the mean FOK-CA correlation in each experimental condition in which children participated revealed no significant correlations. However, in the adult data (Experiment 1b) a significant correlation was obtained for peripheral details 'known'. There was no evidence that retrieval state or detail type influenced FOK accuracy or the FOK-CA association in the data derived from adults and children. Further research, with a larger sample, is needed before these results can be accepted.

9.4 Conclusion

Children's inability to accurately report their experiences has been attributed to a combination of lying and false beliefs. Yet an examination of the phenomenological, remember/know, mental experiences underlying children inaccurate statements revealed that they were often confident that they remembered or knew the information reported. This does not discard the possibility that children answered questions because of a reluctance to admit a lack of knowledge. The three experiments reported in this section provided an insight into children's memory monitoring skills for recollective and non-recollective, FOK experiences. When the data were compared with adults performance, children showed the same improvements in recall accuracy as adults for information 'remembered' than 'known'. More importantly, young witnesses proved to be as reliable as adults in their confidence-accuracy resolution and the accuracy of the feeling of knowing predictions. These common findings and the theoretical and practical implications of the results obtained in the six experiments conducted in Part One of the thesis are discussed in the next chapter.

CHAPTER TEN

Overview of Part One and the Research Focus in Part Two

10.1 Introduction

Assertions of confidence in memories increase the credibility of witnesses in the eyes of the jury and the acceptance of the testimony (e.g., Shaw et al., 1999), yet performance studies indicate that witnesses are unable to reliably match confidence and accuracy (Bornstein & Zickafoose, 1999; Perfect et al., 1993; Perfect & Hollins, 1996). These studies compared the reliability of CA judgements in relation to memory for general knowledge events. While the data are useful, these experiments explained their results in terms of the differences in the stimulus material. This descriptive approach did not consider how eyewitness CA resolution could be improved. A confidence-accuracy judgement is a meta-memory judgement because it requires insight into what is stored in memory, how it is accessed, and estimations of the certainty of that knowledge. Individuals may be confident in reporting what they believe to be true, without due regard to whether they have a specific memory of that event. Therefore, a cognitive approach based on the remember/know procedure and the source monitoring framework, was used to evaluate the strength of the CA association across test (recall, recognition) and witness age (adults, children). The phenomenological remember/know experiences underlying response accuracy, confidence and the CA association were examined in order to identify the optimal conditions for memory monitoring. The novelty of the research was the application of the remember/know procedure to the study of eyewitness memory. Memory for the central and peripheral details of a video-taped event was measured, and a source monitoring task included.

The assumption of the remember/know model is that the two retrieval states are mutually exclusive. 'Remember' judgements are assumed to index a special type of self-awareness which Tulving (1985) described as 'autonoetic conscious'. Knowledge derived from self-awareness is more accurate and confidently expressed than information that is merely known (e.g., Hyman et al., 1998). 'Knowing' is characterised by a general familiarity of an event, but a lack of knowledge of the specific details because there is no conscious

recollection of the event. The accuracy of memories is dependent on the efficiency of reality and source monitoring (Johnson & Raye, 1981; Johnson et al., 1993), and the optimal conditions that facilitate both types of memory monitoring are present in the 'remember' retrieval state outlined by Tulving (1985).

The experiments reported in Part One of the thesis addressed two specific gaps in the literature. First, Tulving made predictions for accuracy and confidence but the possibility that confidence-accuracy processing could be similarly enhanced was not considered. Second, developmental psychologists express a concern that children are less reliable witnesses than adults. They stress the need for research to identify the strengths, weaknesses and ways of improving the reliability of children's reports (Flavell, 1999; Poole & Lindsay, 1998). Some studies conducted with children and modelled after the remember/know procedure used a word-list paradigm. Additionally, these experiments evaluated the influence of the state of awareness at retrieval to accuracy and confidence separately (e.g., Toplis, 1997). However, what is also needed is an understanding of how children use their insights into the state of awareness accompanying their responses, to match confidence and accuracy. Meta-memory theorists (e.g., Koriat & Goldsmith, 1996; Koriat, 1998) claim that when individuals cannot improve the quality of what is retrieved, they can improve on the quality of what is reported. This is particularly relevant to the way in which witnesses are questioned for their accounts of an observed event. Since the conditions under which witnesses attend to and encode information is beyond the control of an interviewer, the interviewer must find a way of optimising the retrieval conditions in order to improve the quality of the responses given.

The discussion summarises the data across recall and recognition tasks because the patterns in the proportion of accuracy reflected a difference in test, rather than age. 'Remembering' improved recall, but not recognition accuracy. The results of the six experiments are discussed in relation to the theories outlined in Chapter One, existing research findings, forensic implications, and new directions for research in Part Two of the thesis. This overview is arranged in three sections; first, the conditions under which a 'remember' state of awareness at retrieval facilitates response accuracy and the confidence-

accuracy relationship are outlined; second, the role of re-experiencing events to source discrimination and the link between source accuracy and content accuracy are evaluated; finally, the limitations of the experiments and the modifications introduced in Part Two of the thesis are delineated.

10.2 Recall

Accuracy

The benefits of remember-based recollections to recall accuracy in memory was reported for words (Toplis, 1997, Experiment 1; Tulving, 1985; Experiment 1) and autobiographical memory (Hyman et al., 1998). Experiments 1a and 2a confirmed the importance of ‘remembering’ or autonoetic consciousness, to the accurate reporting of eyewitnessed events. In Chapter One mention was made of the role of ‘feature overlap’, ‘optimal retrieval’ and ‘encoding specificity’, all of which are assumed to occur during a ‘remember’ retrieval state. The central detail accuracy bias sometimes reported in the literature (Brainerd & Reyna, 1998a; Christianson et al., 1991, Experiment 1; Heath & Erickson, 1998; Loftus et al., 1987) was eliminated in Experiment 2a. Consequently, accuracy was equivalent for both the central and peripheral details of the eye-witnessed event. The data were consistent with prior research (Burke et al., 1992, Experiment 2; Migueles & Garcia-Bajos, 1999), although these studies did not evaluate how the quality of the mental experience accompanying retrieval affects recall accuracy.

A key finding was that the improvements in event accuracy extended from adults, to children. The data were more encouraging than previous results in which children were less accurate witnesses than adults (Foley & Rater, 1998; McBrien & Dagenbach, 1998, Experiment 1). Research shows that children report central details more accurately than peripheral details (e.g., Gobbo, 2000). However, children in Experiment 2a recalled both types of details accurately. More importantly, a ‘remember’ state of awareness improved response accuracy for central and peripheral details. However, a central detail accuracy bias occurred during a ‘know’ retrieval state. Investigating officers require children to report all information relevant to a crime, both the central and the peripheral details. The effectiveness

of a 'remember' state of awareness at retrieval to recall accuracy across test and participants' age, is displayed in Figure 10.2.1. Eyewitness research outlines the superiority of recognition over recall memory (e.g. Robinson & Johnson, 1996) but the data depicted in Figure 10.2.1 do not conform to this pattern. It is possible that the cues on the recognition test improved memory to the level of recall. Alternatively, the nature of the similarity of the distractor items to the target response may have reduced recognition accuracy.

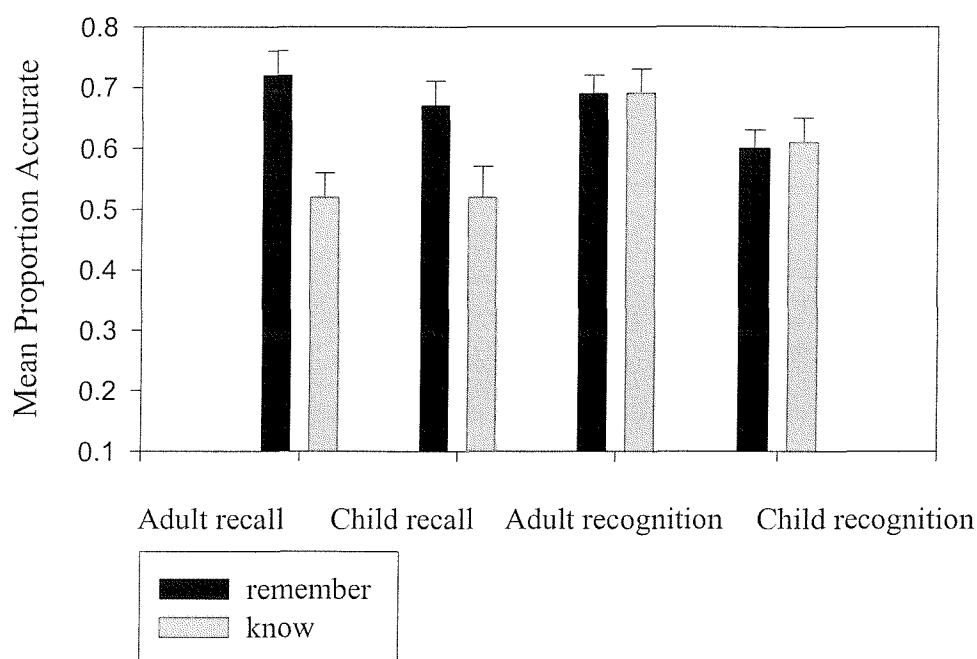


Figure 10.2.1: The effect of retrieval state on accuracy across test and age, with standard deviation bars.

Confidence

There was no effect of retrieval state or detail on confidence. Rajaram and Roediger (1997) suggested that if 'remember' responses reflected higher confidence ratings than

'know' responses, it is an indication that remember/know judgements do not represent states of consciousness that differ from the mental states underlying confidence judgements.

Children's confidence in their accurate recall was unaffected by the retrieval state and detail. Toplis (1997, Experiment 1) found that children were more confident when recalling words they 'remembered', than 'knew'. The data imply that the relationship between retrieval state and confidence, may be moderated by other differences, such the age of the participant. The adult recognition confidence data, in particular, showed a moderating effect of detail type to the retrieval state.

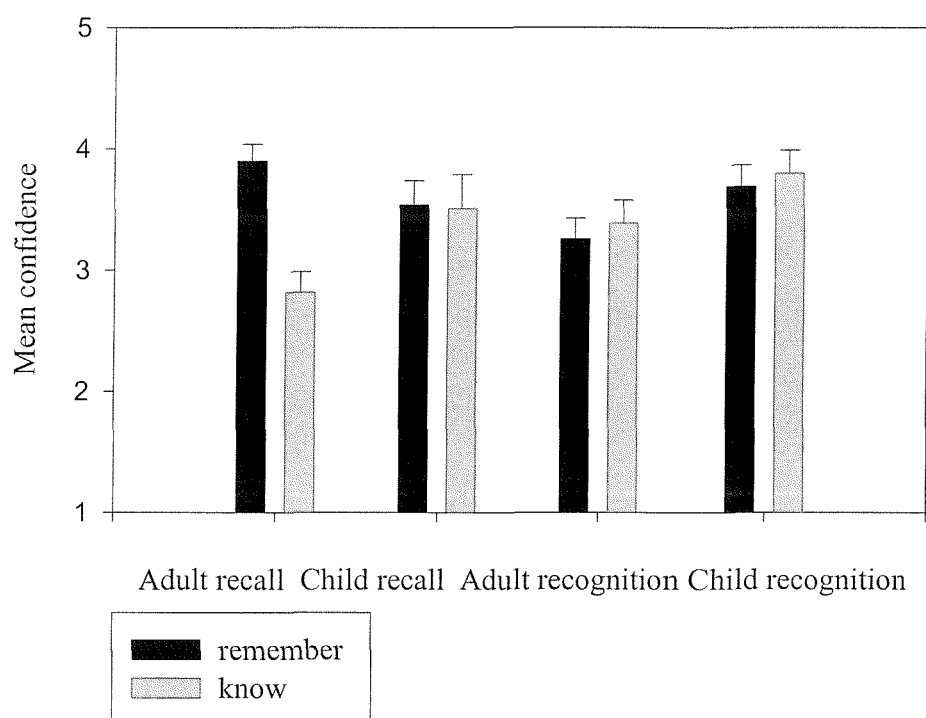


Figure 10.2.2 displays the effect of retrieval state on confidence across test and age, with standard deviation bars.

The Confidence-Accuracy Association

The advantage to confidence and accuracy that accompanied a 'remember' retrieval state was expected to produce reliable CA correlations. The adult recall (Experiment 1a) data revealed that accuracy and confidence accompanied remember judgements. Although there was no effect of detail type on accuracy, meta-memory judgements reflected a central detail bias. The ability to remember an event appeared better for strong, central detail memory traces. Children's recall data (Experiment 2a) revealed that neither the retrieval state nor detail type, influenced the strength of the CA correlations. The CA correlations for all details 'remembered' and 'known', across test and age, are displayed in Figure 10.2.3.

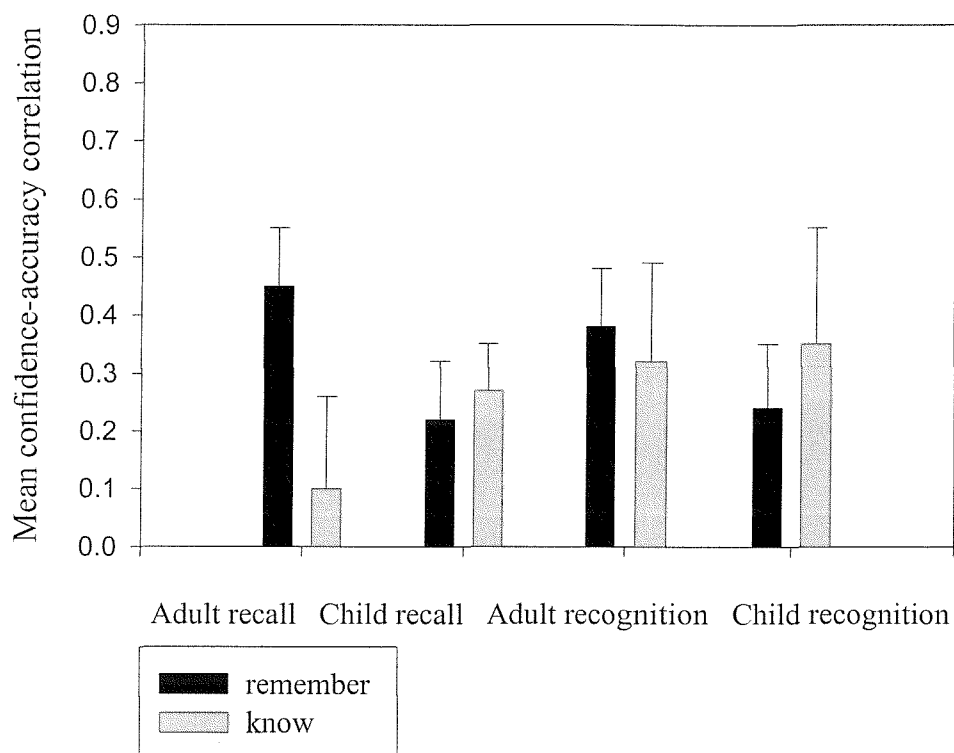


Figure 10.2.3: The effect of retrieval state on the CA correlation across test and age, with standard deviation bars.

10.3. Recognition

Accuracy

A developmental approach was also used to evaluate the recognition data. In Experiments 1c and 2c the state of awareness accompanying retrieval had no significant effect on recognition accuracy. This contrasted with studies in which ‘remembering’ facilitated word and object recognition (Donaldson, 1996; Java et al, 1998, Experiment 1; Perfect et al., 1996, Experiment 1; Tulving, 1985, Experiment 2; Wagner et al., 1997, Experiment 4). Disparities in the results may be attributed to differences in the stimulus material and task demands. A comparison of the data displayed in Figure 10.2.1 shows that recall benefited from a conscious awareness of events (Experiments 1a, 2a), but recognition was equivalent during ‘remember’ and ‘know’ retrieval states (Experiments 1c, 2c). There are several possible explanations for this finding. First, more contextual detail is provided by the alternative answers on a recognition test, than is offered in a cued-recall question. Consequently, a ‘remember’ state of awareness is necessary to locate the requested information during recall, but recognition relies on both recollecting and knowing an answer (e.g., McElree et al., 1999). Second, accurate word recognition can occur in the absence of recollection (Gardiner & Java, 1991, Experiment 1). Third, the use of forced-choice questions requires little or no reconstruction of memory, so that information remembered and known are equally accurate (Gwyer, 1997).

Feedback from some of the participants in the Experiments 1c and 2c indicated that it was more difficult for them to distinguish whether the answer present in the list of alternatives was ‘remembered’ or ‘known’. This confusion may occur because the familiarity of an event associated with ‘knowing’ makes information as accessible as if it was ‘remembered’. This ease of retrieval can be mistaken for remembering (Kelley & Lindsay, 1993). The similarity of the alternative responses on the recognition to the answer may be responsible for participants’ inability to reliably discriminate between accurate and inaccurate responses they ‘remembered seeing’. For example, a man shown in the video-event presented to participants wore a white shirt and beige trousers. The alternative answers to the question, ‘What was the colour of the man’s shirt?’, were white, beige, black

and blue. Some participants reported that the shirt was 'beige', a source transference error. The similarity of the alternative responses to the answer affects the ability to accurately judge if the item was remembered or known (Dobbins, Kroll & Liu, 1998).

There was no main effect of detail type on adult recognition accuracy but the interaction between mental states at retrieval and detail type, approached significance ($p = .052$). Specifically, remembering improved peripheral detail recognition accuracy but it reduced central detail recognition accuracy. The ability to improve peripheral detail memory is forensically relevant when one considers that trivial, background events may contain vital evidence. Additionally, since central detail memory is good, there is more room for improving memory for peripheral details during a 'remember' retrieval state. Children's recognition accuracy was as good for central, as peripheral detail reports.

Confidence

The state of awareness at retrieval and detail type were unrelated to adult recognition accuracy (See Figure 10.2.1). Despite this, participants were more confident when they accurately answered peripheral than central details they knew (see Figure 4.6.2). Consequently, the factors that influence confidence may not influence accuracy (Leippe, 1980), and this is one reason why CA resolution is sometimes unreliable. The results provide an insight into the difficulties witnesses face when trying to match confidence and accuracy. Children were equally confident when recognising information they 'remembered' and 'knew', and confidence was also equivalent for central and peripheral details.

Confidence-Accuracy Association

Adults demonstrated better CA resolution when they reported peripheral details they 'knew' than 'remembered'. Robinson and Johnson (1998) also reported that the CA association was stronger when responses were judged to be 'known' at retrieval, than 'remembered'. In Robinson and Johnson's study another type of recognition test was used, the identification of suspects. Participants in that study also answered questions relating to the memory for the crime event. In this thesis children's CA processing was better for central

than peripheral details they remembered during recognition (Experiment 2c). In contrast, children's CA judgements for items recalled were unrelated to the state of awareness at retrieval and detail type (Experiment 2a).

Overall, the results displayed that the remember/know procedure can be successfully used to examine eyewitness memory. Specifically, the remember/know procedure offers the potential for understanding how a witness's understanding of how his or her memories were retrieved affects behaviour. This behaviour manifests itself in the accuracy and confidence with which knowledge is expressed. The results of the thesis highlight the importance of the psychological setting, the retrieval state, in which cognition takes place and unfolds, to the reliability of a confidence-accuracy judgement. Inaccurate responses, overconfidence and weak CA correlations are attributed to poor metacognition (Paris, 1988).

The experiments reported in the thesis demonstrate that it is possible to identify optimal conditions for efficient metacognition. The data obtained in Section One revealed that although recall accuracy benefited from 'remembering' events, but recognition did not, detail type often moderated retrieval state to create the optimal retrieval conditions necessary for CA resolution (Experiments 1a, 1c, 2c). The optimal conditions for CA processing is attributed to the retrieval conditions (Deffenbacher, 1980; Leippe, 1980), but the type of detail reported is equally important. In some experiments the optimal retrieval condition for strong CA correlations was a 'remember' state of awareness (Experiments 1a and 2c), in other studies 'knowing' facilitated CA resolution (Experiment 1c). These results give some validity to the belief that the strength of the meta-memory relation varies with both the nature of the task and the person's age (Bjorklund & Douglas, 1998). The data on children's eyewitness CA performance were particularly relevant in the absence of current research into this aspect of children's memory monitoring skills. The present results offer a more optimistic view of child witnesses' ability to match confidence and accuracy than previously reported by Sykes et al. (1988). These researchers obtained a strong, but negative CA correlation.

10.4. Remembering and source monitoring

Integral to CA resolution is source monitoring and the experiments reported in Part One of the thesis examined eyewitness memory after a 24 hour retention interval. A source monitoring task was included in which information was presented via a videotape and an audiotape. The source monitoring framework (SMF) predicts that event memory is likely to be correct when memories can be verified by locating the source of one's knowledge. Part of the source attribution process involves a decision of the quality of the memory experience along a dimension of familiarity or recollection (Johnson, 1997). Research modelled after the SMF reveals that remembering is associated with source accuracy (Henkel et al., 2000; Multhaup et al., 1999). Additionally, the distinctiveness or salience of the target information assists source discrimination, which in turn increases the threshold for response accuracy and confidence in the veracity of those memories (Johnson, 1997). Consequently, there is a direct link between source monitoring efficiency and a strong confidence-accuracy association. Witnesses can make two kinds of mistakes when they are exposed to several sources of information. They can provide a correct response without the knowledge of the information source; alternatively, the source can be known but the content details are unknown.

Two main issues were addressed in the thesis, the role of remembering to accurate source discrimination and the importance of source accuracy to overall content accuracy. These issues were important because evidence of source accuracy or source mis-attribution reveals how information may be processed and accessed during retrieval, as well as what aspects of memory are necessary for response accuracy. There is a bi-directional relationship between metamemory knowledge, (e.g., identifying one's retrieval state), and memory performance (e.g., response accuracy, confidence and CA resolution). Specifically, knowledge of the contents of memory can increase memory performance, which in turn facilitates further metamemory knowledge (Bjorklund & Douglas, 1998). These theorists suggested that the nature of this bi-directional relationship varies as a function of age and task variables. This is consistent with claims that source accuracy is not always the product of recollection and source identification may not be necessary to answer a question (Dodson &

Johnson, 1996). Consequently, the relationship between metamemory and memory were evaluated across test (recall, recognition) and age (adults, children).

Recall

Despite the predictions outlined in the SMF and empirical evidence (e.g., Henkel et al., 2000), only 2 percent of the variance associated with adults' source accuracy was due to 'remembering' the answer at retrieval. Knowing an answer accounted for 3 percent of the variance associated with source accuracy. Together the results indicated that the state of awareness at retrieval was not a significant predictor of source accuracy. Henkel examined memory for everyday events such as a toilet flushing and a balloon popping. Eyewitness events are unique to an incident and more complex than the every day events evaluated by Henkel et al. A related finding was that children's ability to remember information was unrelated to their source accuracy. The result was inconsistent with the predictions of the SMF. Other source monitoring studies conducted with children reported that source accuracy improves during a remember-retrieval state (e.g., Toplis, 1997, Experiment 2). Toplis evaluated children's source memory for words and toys, so once again the differences in the results obtained in Experiments 1a and 2a, and the results obtained by Toplis and Henkel et al. reflect, among other factors, differences in the stimulus material. Alternatively, the effectiveness of remembering was possibly reduced by the delay in testing (Payne et al., 1996) or the fact that a 'remember' judgement is an implicit source judgement (Hyman et al., 1998). This implies that it may be conceptually difficult to differentiate between the two processes.

The SMF is criticised for not explaining event memory independently of memory for source (Bayen et al., 1996). The assumption of the SMF is that source memory improves memory for an event. When adults accurately identified the source of an event it was significantly related to the overall accuracy for that event. Seven percent of the variance of event accuracy was accounted for by its linear relationship with source accuracy. In contrast, the children's data revealed that 1 percent of the variance of event accuracy was accounted for by its linear relationship with source accuracy. So source accuracy was not associated

with event accuracy, although when children accurately identified the source of their answer they were confident in their memory of the event. While some experiments concluded that source and event memory are unrelated (Foley & Ratner, 1998; Lindsay, 1990; Powell & Thompson, 1997; Yonelinas, 1999), these results are worrying on two accounts. First, it is expected that by monitoring the source of their knowledge children can acquire further insights into their cognitive functioning and this will improve performance (Johnson et al., 1993; Pillow, 1999). Second, children will be regarded as credible witnesses if they can confirm the source of their knowledge, but this does not necessarily mean that they will give an accurate account of an event. Psychologists may be more aware of the differences between accurately reporting source material and an accurate account of the episodic event, than legal personnel and jurors. Thus, undue weight may be attached to children's memory for the source of their information when they are interviewed by the police or when they testify in court.

Recognition

Neither a 'remember' nor a 'know' state of awareness at retrieval was significantly related to adults' source accuracy. In contrast, children's ability to 'remember' information was significantly, but negatively, related to their source accuracy. Information 'remembered' was source inaccurate, possibly due to the fact that when children 'remembered' an answer they accessed a related part of the video-taped event, but not the target event (Clancy et al., 2000). These findings suggest that the process by which adults and children make source decisions are qualitatively different (Lindsay, Gonzales & Esso, 1995; Wooley & Bruell, 1996). Wooley and Bruell argued that adults rely on cognitive processes such as mental images, but children may want to display their knowledge without verifying the source (Poole & Lindsay, 1998) or they may lack the relevant metamemory skills to appreciate the ease with which source confusion occurs. Children may also experience difficulty in differentiating between remembering and knowing (Ackil & Zaragoza, 1995). Lindsay et al. (1995) noted that when adults feel uncertain about the source of their memory, they may perform effortful and strategic searches for additional information, whereas children may fail to do so.

The data obtained in Experiments 1c and 2c cause concern in light of the fact that memory for source appears to be disassociated from, or negatively related to, content memory. There are several reasons for this dissociation in recognition memory. First, memory of an event may not include memory for the source of the event. Recognition is based on conscious awareness and familiarity with an event (e.g., Haist, 1992; McElree et al., 1999). A participant may either remember the answer to a question or know the answer from among a list of alternatives. Source memory is more specific, according to the SMF source identification occurs only by remembering an event. Second, memory for the source origin may decay, particularly after a delayed memory test, while the overall content information remains intact. It can be argued that a retention interval of 24 hours is not a forensically, realistic delay. Nevertheless, source accuracy is better on an immediate test than a delayed test (Payne et al., 1996). Fuzzy-trace theory (Brainerd & Reyna, 1998a) claims that 'gist' material is adequate to produce a recognition response, but the source material which is located in verbatim, decays over time. A third explanation is that the source material was not initially encoded (Woolley & Bruell, 1996). The video and audio-taped material presented to participants contained actions performed by many individuals so it was possible that participants did not attend to some portions of the stimulus event.

10.5 'Do not know' responses

Tulving's remember/know procedure was criticised in Chapter One for offering participants a dichotomous choice without a 'do not know' option. Some experiments modelled after the procedure encourage a 'guess' response (e.g., Toplis, 1997). Eye-witnesses are encouraged to relate only their personal experiences and to indicate their lack of knowledge of events.

'Don't know' options increase accuracy (Pozzulo & Lindsay, 1997) by reducing the demand to provide a response that may be an incorrect one (Memon et al, 1996). Children, in particular, who do not admit that they lack the answer to a question, are more prone to reporting false memories especially when the 'false' event is similar to an experienced one (Quas et al., 1999).

The mean number of 'do not know' responses are summarised by detail, test type and

participants' age in Table 10.5.1. The results of a one-way, repeated measures ANOVA on the effects of detail to the mean number of don't know responses given by adults on the recall test, showed a significantly higher number of don't know responses to central than peripheral detail questions ($F(1, 166) = 16.74, MSE = 31.15, p < .001$). A different result emerged for adult recognition memory. There was no difference between the number of don't know central and peripheral details responses given ($F(1, 107) = 3.28, MSE = 5.67, p > .05$). Children gave more 'don't know' responses to central than peripheral detail questions on the recall test ($F(1, 180) = 9.21, MSE = 8.66, p < .001$) as well as the recognition test ($F(1, 131) = 6.51, MSE = 5.18, p < .025$). Attentional focus and fuzzy-trace theories claim that memory is better for salient, central details. Therefore, one would expect more don't know judgements in relation to unanswered central detail questions. The data suggested that participants may have been more aware of their knowledge, or lack of knowledge, for the central than peripheral details.

Table 10.5.1: Mean number of central and peripheral detail 'do not know' responses and (standard deviation scores) for the video information by test and participant's age.

	Central details	Peripheral details
Adult recall	3.07 (2.51)	2.46 (1.90)
Adult recognition	2.18 (2.11)	1.85 (1.81)
Child recall	1.44 (1.88)	1.13 (1.46)
Child recognition	1.67 (1.73)	.89 (1.50)

10.6 States of awareness and feeling-of-knowing (FOK) predictive accuracy

Feelings of knowing represent memory monitoring for the availability of knowledge in the absence of spontaneous retrieval. As such an individual believes that the target information is stored and could be recognised. FOK experiences are another example of how metamemory influences behaviour, in this case, an ongoing search for the target detail. The study of what triggers FOK's and the accuracy of these 'hunches' is important because of the

ease with which our everyday and eyewitness behaviours can be influenced by familiar but unretrievable memories. The impetus for the research into FOK experiences and the accuracy of prospective memory in the thesis, stemmed from evidence that eyewitness FOK accuracy is unreliable (Perfect & Hollins, 1999). Perfect and Hollins' study merely compared FOK predictions for general knowledge versus eyewitnessed events. It was felt that a more in-depth understanding of what triggers FOK judgements for eyewitness memory, and the retrieval conditions that are associated with predictive accuracy was needed. Therefore, Experiments 1b and 2b addressed this need. Additionally, more research is required in order to identify similarities or differences between metacognitive processing and standard cognitive processing (Yzerbyt, Lories & Dardenne, 1998). For example, how a central detail bias in attention and accuracy, manifests itself as a strong central detail CA correlation. The FOK studies addressed the main goal of the thesis, which is to evaluate the retrieval conditions that facilitate memory monitoring and strengthen the CA association under different retrieval conditions.

There is theoretical support for evaluating the link between the state of awareness at retrieval and FOK judgements. Koriat and Levy-Sadot (1999) suggest that some FOK experiences are based on partial information or material related to the target item. This type of FOK experience is linked to Tulving's 'remember' retrieval state, because there is more conscious awareness of information that is related to the target question. In the absence of this partial information, there may be an affective state of awareness that gives rise to a 'hunch' or 'feeling of knowing'. This is linked to the 'know' state in the remember/know model. Other theorists believe that FOK judgements represent a sense of familiarity (Lories et al., 1998). To date, FOK studies have not identified if remember/know mental states underlie FOK recognition accuracy, confidence and the FOK-CA association. The data obtained with adults (Experiment 1b) and children (Experiment 2b), offered an insight into first, what aspects of FOK experiences are reliable; and second, the retrieval state that is associated with FOK accuracy.

Adults gave an equivalent proportion of FOK responses, in relation to don't know' responses, to unanswered central and peripheral detail questions. In contrast, children gave

more FOK judgements for unanswered central than peripheral detail questions. The children's data were consistent with claims that FOK's are driven by the strength of the memory trace, with strong traces initiating the search for information and the belief in prospective memory (Koriat, 1993).

The important question related to the mental states that underlie FOK recognition accuracy. The results indicated that neither the state of awareness at retrieval nor the type of detail recognised influenced adult's predictive accuracy, confidence or the FOK-CA association. However, a significant FOK-CA correlation was obtained for peripheral details judged to be 'known' at retrieval. This correlation implies that participants were more confident when they accurately recognised peripheral details than when they were inaccurate, and this reliable CA association was derived by 'knowing' the information reported. The state of awareness at retrieval and the centrality of the detail reported were also unrelated to children's predictive accuracy, confidence and the FOK-CA association.

The remember/know procedure reduced the number of valid cases across the experimental conditions available for analysis. Therefore, the two experiments need to be replicated with larger samples before the results can be accepted. Nevertheless, given the paucity of FOK eyewitness experiments, the data are relevant on three accounts. First, predictive accuracy was (.66) and (.51) for adults and children respectively across the experimental conditions and this was higher than chance performance (.25). Second, the findings disproved claims that eyewitness FOK predictive accuracy is unreliable (Perfect & Hollins, 1999). Instead, the data suggested what aspects of the FOK experiences, in terms of the type of detail reported, are reliable. Third, the data were the first on children's FOK accuracy for eyewitness memory, as children's prospective memory is commonly examined in relation to their judgements of learning (e.g., Efklides et al., 1999). Fourth, the results concurred with other evidence that the factors that prompt FOK judgements are not always the same factors that determine FOK predictive accuracy (Koriat, 1995; Leibert & Nelson, 1998; Lories et al., 1999). This is because FOK judgements reflect a likelihood of prospective memory without due regard for its accuracy. A FOK experience is based on, among other factors, the salience of the cue in the question, the retrieval of correct and

incorrect associated information, or an unwillingness to reveal a lack of knowledge. In contrast, FOK predictive accuracy is based only on the correctness of the recognised item.

10.7 Contributions of Part One of the thesis

The main contribution of Part One was the examination of the reliability of eyewitness confidence-accuracy judgements with the remember/know procedure. The examination of children's CA processing filled a current gap in the literature. This developmental approach to understanding the mental origin underlying response accuracy and the CA association made the results of the thesis more generalizable, across age groups. Another innovation was the investigation of the mental states of awareness underlying FOK predictive accuracy and the FOK-CA association.

A manipulation check was conducted to ascertain if the descriptions of the 'remember' and 'know' mental states given to witnesses were understood and followed. With the exception of two experiments, (Gardiner et al., 1998; Java et al., 1997), research modelled after the remember/know procedure assumed that participants understood the task and the instructions. However, it is unreliable to draw inferences about the relationship between the state of awareness accompanying retrieval and performance, unless participants are given the opportunity to describe how they retrieved the target information and how these cognitive processes influenced their decisions. The self-report data derived from participants in Experiments 1a, 1c, 2a, and 2c, were not used in the same way as the qualitative data collected by Gardiner et al. (1998) and Java et al. (1997). In the present experiments all participants completed a post-experimental questionnaire to evaluate (1) if they understood the distinction between remembering and knowing; (2) how they ascertained when they 'remembered' an answer as opposed to 'knowing' it; and (3) what made them confident in their response. The comments by the majority of participants indicated that the instructions were understood, but a minority of the participants experienced difficulty in distinguishing between the two retrieval states.

10.8 Limitations of the studies

An inherent flaw in the remember/know procedure is that the proportion of 'know' responses decreases in relation to the number of 'remember' responses. The six experiments reported in Part One highlighted the methodological difficulties that arise from the assumption of mutual exclusivity of remember/know judgements. The number of valid cases in each of the experiments was reduced to approximately half the number of participants initially tested. The ANOVA analyses could only be performed if there were sufficient cases with data in all the experimental conditions; central details remembered, central details known, peripheral details remembered and peripheral details known. This limitation of the remember/know model was not identified in the psychological literature despite the fact that a large number of studies have been based on the remember/know procedure. Participants in word recognition studies are often forced to give a response, guessing if necessary (e.g., Toplis, 1997). While this use of forced-responses may prevent a decline in the number of valid cases, it is not forensically appropriate for eyewitness experiments. Witnesses are discouraged from guessing and strongly encouraged to state if they do not know the answer to questions asked.

The limitation of using remember/know judgements as a within-subjects measure was redressed in Part Two of the thesis by manipulating retrieval state as a between-subjects measure, through a pre-test retrieval instruction. Recall and recognition studies were conducted in Part One, but there were insufficient cases across the experimental conditions to examine the effect of test type to eyewitness memory. In hindsight, the feedback derived from participants in which they evaluated their understanding of the distinction between 'remember'/'know' states of awareness, should have been used as a criterion of inclusion or exclusion in the data analysis. At the time the research was conducted the self-reports provided a manipulation check that remembering was accompanied by the conscious awareness of, and the re-experiencing of events, while knowing was differentiated by the absence of these features. Over 95 percent of the participants in all the experiments claimed that they understood the difference between the two retrieval states, so the results can be considered reliable.

10.9 The research focus in Part Two

The results of Part One of the thesis demonstrated that a 'remember' state of awareness at retrieval facilitated response accuracy, confidence and CA resolution under some conditions. The purpose of the experiments reported in Part Two was to assess the extent to which a 'remember' retrieval state encouraged prior to reporting information, through a pre-test instruction, could also increase accuracy, confidence and the strength of the CA association. Specifically, half the participants were asked to 'report only what they can remember seeing or hearing in their mind' of a previously presented event. This phrase was absent in the general, non-directive instruction given to the remainder of the participants. The decision to manipulated retrieval 'states' through pre-test instructions, was based on the fact that when witnesses are questioned by the police, they are not asked to determine whether they 'remember' or 'know' their answers to each question. Instead, legal personnel rely on a global impression of the accuracy and consistency of the entire testimony. The Cognitive Interview (CI) and the Criterion-Based Content Analysis (CBCA), discussed in Chapter One, assign credibility to a witness and the testimony on the basis of (1) the reporting of personal experiences, and (2) the description of contextual and associated details. Both criteria accompany a 'remember' state of awareness. There are methodological, empirical and practical reasons for manipulating state of awareness as instruction type.

The six experiments reported in Part Two of the thesis did not utilise a delay in testing, or a monitoring task, only a video-event was presented. The most accurate memories of an experienced event are best obtained directly after the incident occurs. When memory was evaluated after 24 hours, some participants gave inaccurate reports, but their confidence in performance remained high. This weakens the CA association. Victims and witnesses may report events immediately after observing them, so there is a practical reason for examining CA processing following immediate recall. Response accuracy was expected to improve because confidence estimates are more realistically matched to performance when details are reported immediately (Granhag, 1997). Moreover, the CA is reported to be almost perfect on an immediate memory test (Koriat & Goldsmith, 1996). The number of central and peripheral detail questions was increased from 16 to 30. The video stimulus used in Part One

of the thesis was retained in Part Two. The focus of the thesis remained the same; the investigation of state of awareness 'instruction' and detail type to response accuracy, confidence and confidence-accuracy processing, under recall and recognition retrieval for adults and children. The effects of instruction and detail to FOK predictive accuracy and the FOK-CA association are examined with adults and children.

PART TWO

Using a Remember-based Instruction to Improve the Eyewitness
Confidence-Accuracy Relationship

CHAPTER ELEVEN

Experiment 3a: The Relationship between State of Awareness Instructions and Confidence-Accuracy Judgements following Immediate Recall

“Memory failures reflect an inability to recover stored information which might otherwise be accessed in an enhanced retrieval environment.” (Mello & Fisher, 1996)

11.1 Introduction

The results of Experiment 1a demonstrated the importance of being able to report from one's personal experience. The ability to remember the eyewitnessed event increased the quantity of information reported and the number of correct answers given. The primary finding was that 'remember' judgements at retrieval were associated with a greater proportion of accurate responses than 'know' judgements. Additionally, confidence was higher for accurate than inaccurate responses remembered but not known, while a remember retrieval state was accompanied by high confidence in memory. Another key finding was that the central detail accuracy bias found in some eyewitness experiments (Heath & Erickson, 1998; Migueles & Garcia-Bajos, 1999; Wright & Stroud, 1998) was eliminated in Experiment 1a. However, the ability to match confidence and accuracy during a 'remember' retrieval state, was moderated by the centrality of the detail described.

The data conformed to claims that successful recall is a combination of the retrieval mode and the memory trace (Burgess & Shallice, 1996). The role of the conscious awareness of one's memories in improving the quality and reliability of eyewitness testimony cannot be underestimated. Context is also an important factor to consider in explaining memory performance (Morris & Gruneberg, 1994), and accessibility to contextual material significantly improves performance (Experiment 1a).

The goal of the present study was to apply the results of Experiment 1a, as a pre-test instruction, to encourage witnesses to re-experience and verify their knowledge before reporting it. The difference between Experiment 1a and this study is that the former evaluated the contribution of a witness's state of awareness accompanying retrieval to performance. In contrast, this study is concerned with manipulating the state of awareness prior to retrieval, through the nature of the pre-test instruction, and to assess its effect on

performance. Additionally memory was assessed immediately after the event was shown to participants.

The description of the 'remember' retrieval state given to participants in Part One of the thesis, was used to create a 'remember' pre-test instruction. Half of the participants were requested to report only what they could 'remember seeing or hearing of the specific detail in question', while the remainder were given a non-directive instruction which avoided reference to 'remembering'. There are several reasons why the 'remember' instruction was expected to improve recall accuracy, confidence and the magnitude of the CA association, more than the 'non-directive' instruction. First, there is a widely held belief that eyewitness errors are due to the reconstructive nature of memory (Loftus, 1979), so the re-experiencing of events improves accuracy (Experiment 1a) by encouraging memory monitoring. When a person is given the goal of remembering events before reporting them, he or she will try to recreate the context in which the target information is located and this will lead to more accurate reports. Second, an accurate account of a particular experience requires selection of the relevant information from all the knowledge stored in memory.

Memory must be highly discriminative in selecting the target answer and rejecting similar responses. This implies that source monitoring must also be accurate. The failure to find to a significant association between 'remembering' and source monitoring in Experiment 1a may be explained by the fact that 'remembering' is implicit source monitoring (Hyman et al., 1998). Hence, remember and source judgements may be 'redundant'. Nevertheless, there is an extensive body of literature that links source accuracy to event accuracy (e.g., Johnson et al., 1993; Johnson, 1997). Consequently, an instruction to report only what could be remembered and verified by the observer, should improve response accuracy by encouraging source and memory monitoring, more than a 'non-directive' retrieval instruction.

Third, remembering not only increases accuracy, but it boosts confidence in performance (Experiment 1a), so it was expected to have the same benefits in this study. Fourth, eyewitness memory can be acquired through incidental and deliberate learning. However, incidental memory can be assisted with a deliberate, retrieval strategy involving an intentional and effortful search for information. This is facilitated when focussed instructions which tap into memory are given (Schacter et al., 1998). Focussed instructions

reduce reconstructive memory which in turn weakens the CA relationship (Leippe, 1980). The Cognitive Interview (CI) is an example of a guided interview technique which was developed by psychologists (Geiselman et al., 1984) to help the police interview witnesses. It is based on Tulving's concepts of 'encoding specificity', 'feature overlap' and 'autonoetic consciousness'. Specifically, witnesses are asked (1) to reinstate the environmental and emotional context surrounding an event; (2) to recall the event from different perspectives, (for example, a bystander to a bank robbery may be asked to recall the incident from the perspective of the teller), and (3) to recall the incident in different temporal order (e.g., forwards and in a reverse order). Empirical research into the effectiveness of the CI reveals that it improves accuracy by reducing errors of commission; that is, introducing material that was not observed (Mello & Fisher, 1996). Accuracy improves by as much as 35 percent (Kohnken, Schimossek, Aschermann & Hofer, 1995), and descriptions of persons are confidently and accurately reported, leading to a high CA correlation (Gwyer & Clifford, 1997). Furthermore, true statements contain more contextual and sensory details than false statements (Hernandez-Fernaud & Alonso-Quecuty, 1997). The SMF, discussed in Chapter One, also emphasises the importance of the quality and clarity of the mental experience as a guide to the authenticity of the memory.

Remembering is efficient given the constraints of limited resources (Schooler & Anderson, 1997). The centrality of an event recalled limited the ability to remember information sufficiently to match confidence and accuracy (Experiment 1a). Similarly, the CI which relies on the retrieval of autonoetic experiences has its limitations. It increases the number of correct responses, errors and confabulated details (Memon et al., 1997) and leads to inaccurate descriptions of persons (Hernandez-Fernaud & Alonso-Quecuty, 1997). The CI is inappropriate for interviewing traumatised victims (Croft, 1995), and detrimental to CA resolution following suspect identification (Read, 1995, Experiment 1; Robinson & Johnson, 1998). In Read's experiment the provision of enhanced contextual information led to high confidence in false positives and lower CA correlations after a 2 day delay.

In addition to remembering, other factors influence accuracy and CA processing. An immediate memory test improves accuracy (Payne et al., 1996; Warren & Lane, 1995) and strengthens the CA correlation (Koriat & Goldsmith, 1996, Experiment 1; Robinson & Johnson, 1996; Robinson et al., 1997). Koriat and Goldsmith obtained an almost perfect

CA correlation with an immediate memory test. Robinson and Johnson (1996) reported a CA correlation of .58 when undergraduate recalled details of a crime video 7 minutes after it was viewed. In a related study, Robinson et al. (1997) administered a surprise recall test to undergraduates 4 minutes after a video of a crime event was presented. They found that confidence was higher for correct than incorrect responses, the mean proportion of accuracy was ($M = .51$), and the CA was significant (.55).

The results of Experiment 1a, and the expected improvements to CA processing with an immediate test, led to the predictions that a 'remember' instruction would improve recall accuracy, confidence and the CA association more than a 'non-directive' instruction. Accuracy, confidence and the CA will be better for central than peripheral details.

11.2. Method

Design

A 2 x 2 mixed factorial design was used in which Instruction (remember, non-directive) was a between-subjects variable and Detail (central, peripheral) was a within-subjects variable. Following presentation of the to-be-remembered information all participants completed a cued-recall test.

Participants

Ninety-two students (73 women, 19 men) ranging in age from 16-55 years, ($M = 24$ years), participated in the study. Participants were recruited from Southampton Institute and Southampton City College. They were randomly assigned to one of the two instruction conditions and gender was balanced as far as possible across the groups. Group One ($n = 47$) received a 'remember' instruction highlighting recollection and context. Group Two ($n = 45$) received a non-directive instruction which avoided reference to reporting only what participants remembered seeing or hearing.

Materials

To-be-remembered event:

The to-be-remembered event was an extended version of the film clip shown to participants in Experiment 1a. The clip lasted 4 minutes, 25 seconds and was viewed on a Sony Profeel

28 inch colour monitor via a Panasonic AG6200 Video Recorder.

Questionnaire

There were 31 questions, the first of which was a practice question and formed no part of the analyses while the remaining thirty questions constituted the memory test. The 16 video-related questions used in Part One of the thesis, 8 central and 8 peripheral, were retained in the present study. Fourteen additional questions, 7 central and 7 peripheral, relating to the extended version of the film clip were devised based on the definitions of 'central' and 'peripheral' details discussed in Experiment 1a. Although attempts were made to ensure that items defined as 'central' details covered the key plot event, some central details may cover more than key actions and events. This could potentially reduce the size of differences between the two detail conditions. Three independent raters viewed the film clip and classified the events into central and peripheral details. Inter-rater reliability of the 14 additional test questions was 96% for all test items. The questions were presented in a chronological order with respect to events shown in the film. Care was taken to ensure that the answers to earlier questions could not inform the answers to later questions. In answering each of the questions, participants either filled in their answer in the space provided, wrote 'I do not know the answer', or made a feeling of knowing judgement.

Instructions

The instructions were written on the questionnaire. Participants in the experimental condition were instructed to report **only what they can remember seeing or hearing** of the event previously presented. This parallels the 'remember' state of awareness described in Experiment 1a. Participants in the control condition were given a non-directive instruction which avoided reference to reporting what was remembered. Both sets of instructions discouraged guessing by providing a 'don't know' option.

The *remember* instruction was as followed.

"I am interested in what you can tell me about the video you have just watched. However, I want to make sure that what you tell me is as accurate as it can be. So, what I am asking you to do is to answer the following questions ONLY if you can

truthfully say that you REMEMBER SEEING and HEARING the detail or details in question. If you think that you know the answer, but don't actually REMEMBER SEEING or HEARING the details, then please DO NOT answer the question but do indicate whether you might recognize the correct answer from a list of alternatives. If you didn't see the details and really don't know the answer, then don't be afraid to indicate that you do not know the answer." Please don't guess and try to be as accurate as possible. If you cannot answer the question, I want you to tell me if this was because (a) you did not know the answer or (b) you feel you would know the answer if I gave you some clues."

In the *non-directive* instruction, participants were told:

"I am interested in what you can tell me about the video you have just watched. However, I want to make sure that what you tell me is as accurate as it can be. So, what I am asking you to do is to answer the following questions as truthfully as you can. If you really don't know the answer, do not guess, and do not be afraid to write on the questionnaire 'I do not know.' If you cannot answer the question, I want you to tell me if this was because (a) you did not know the answer or (b) you feel you would know the answer if I gave you some clues."

Feedback from a sample of 18 participants (9 were given the 'remember' instruction and the 'non-directive' instruction was administered to the remainder) indicated that participants understood each set of instructions and followed them when answering the questions. More importantly, there was little evidence to suggest that participants given the 'non-directive' instructions were relying on recollection or the mental reinstatement of context to answer questions. Only 1 out of the 9 participants reported relying on mental imagery to aid recall. To the extent that participants' self-reports are reliable, this was an indication that the manipulation of state of awareness by instruction was clear and effective. All participants reported that the instructions prevented them from guessing and helped them to take advantage of the 'don't know' option.

Procedure

Participants watched the event in groups of approximately 10-12 after which they completed a surprise memory test in the form of a self-administered questionnaire. For each item on the recall test that was answered, participants gave a rating of confidence on a 5-point Likert scale (where 1 = not very confident, and 5 = very confident). A practice question was included at the start of the questionnaire to ensure that participants understood the task and the instructions. Participants were told not to discuss the task with one another and their performance was monitored by the researcher. The memory test was completed within 25 minutes.

11.3 Results

Eyewitness Recall

The data analysis was identical to that outlined in Experiment 1a. For each item on the cued-recall test responses were categorized as either accurate, inaccurate, or don't know. The responses to the questions were scored in a 'blind' fashion; that is, regardless of the type of detail reported. This was done to prevent any bias in the data analysis. Table 11.3.1 displays participants' performance and confidence ratings, across central and peripheral details, for the 'remember' and 'non-directive' instructions.

Total number of questions answered. The focus on analysing accuracy risked missing differences in the overall level of eyewitness responses. One way of redressing this issue is to evaluate the total number of questions participants answered, regardless of the accuracy of these responses, the retrieval instruction given or the type of detail reported. This gives an indication of the total amount of information pertaining to an eye-witnessed event that can be immediately recalled. Thirty questions were asked and the mean number of questions answered and (standard deviation) were 22.54 (4.51). Participants recalled 75 percent of what they saw. A two-way, repeated measures Analysis of Variance (ANOVA) assessed the effects of instructions and detail to the total number of questions answered. Instruction had no significant effect on the quantity of information reported ($F(1, 90) < 1$, $MSE = 8.31$, $p > .05$). The number of questions answered, out of 30, when participants were given the 'remember' and 'non-directive' instructions were 22.12 and 22.97 respectively. Therefore, it seems unlikely that (1) the 'remember' instruction made

participants more conservative in responding to questions, than the 'non-directive' instruction, and (2) that the 'non-directive' instruction elicited information that was also 'remembered'. Central than peripheral details were recalled ($F(1, 90) = 176.57$, $MSE = 571.40$, $p < .001$). The interaction the two variables was non-significant ($F(1, 90) < 1$, $MSE = 1.23$, $p > .05$). The means (and standard deviations) for each experimental condition are summarised in the first row of the data presented in Table 11.3.1.

Number of correct responses. The mean number of questions participants correctly answered was 13.71, or 46 percent, of the 30 questions asked. A two-way, repeated measures (ANOVA) of the mean total correct responses by instruction and detail revealed that the 'remember seeing' instruction significantly improved the number of correct responses than the non-directive instruction ($F(1, 90) = 7.27$, $MSE = 136.71$, $p < .025$). This result is particularly important in light of the fact that the 'remember' instruction did not appear to make participants more conservative in reporting events and boosting accuracy by virtue of a lower number of questions answered accurately, than generated with the non-directive retrieval instruction. There were more accurate central than peripheral details ($F(1, 90) = 80.52$, $MSE = 311.52$, $p < .001$). The interaction between instruction and detail was non-significant ($F(1, 90) = 1.01$, $MSE = 3.90$, $p > .05$). The mean numbers of correct responses across instruction and detail are summarised in the second row of Table 11.3.1.

The mean numbers of incorrect responses for all participants are listed in the third row of the data in Table 11.3.1. An ANOVA analysis to evaluate the effects of instruction and detail on the mean number of incorrect responses revealed that the 'remember seeing' instruction led to a high number of false reports ($F(1, 90) = 11.41$, $MSE = 212.42$, $p < .025$). There was more incorrect central than peripheral detail answers ($F(1, 90) = 14.86$, $MSE = 39.16$, $p < .001$). The interaction between the two variables was non-significant ($F(1, 90) = 3.61$, $MSE = 9.51$, $p > .05$).

Table 11.3.1: *Mean number of questions answered, correct responses, incorrect responses, don't know responses and proportion accuracy across instruction and detail for adult witnesses, together with confidence ratings when accurate and inaccurate (and standard deviations).*

	Central Details		Peripheral Details	
	Non-directive	Remember	Non-directive	Remember
No. of questions answered	13.33 (1.60)	12.74 (2.06)	9.64 (2.73)	9.38 (3.54)
No. of correct responses	7.13 (.25)	9.15 (.20)	4.82 (.11)	6.24 (.17)
No. of incorrect responses	6.20 (.16)	3.60 (.14)	4.82 (.10)	3.13 (.14)
No. 'don't know' responses	.93 (.15)	1.33 (.12)	3.42 (.19)	4.00 (.17)
Proportion Accurate	.55 (.04)	.70 (.03)	.54 (.04)	.66 (.03)
Confidence when accurate	4.12 (.16)	4.09 (.16)	3.49 (.17)	3.73 (.12)
Confidence when inaccurate	3.17 (.13)	3.23 (.10)	3.18 (.12)	3.07 (.11)

An overview of the pattern of results shown in Table 11.3.1 revealed an increase in response accuracy when participants were given the 'remember' instruction. Separate analyses were conducted to examine the effects of instruction and detail on response accuracy, confidence and the CA association. The results are presented in turn.

Proportion of Accurate Responses

The proportion of accurate responses was calculated in relation to the total number of retrieval attempts [accurate + inaccurate]. The proportion of accurate responses ranged from .55 to .70 across the experimental conditions ($M = .61$), and the mean was marginally lower than the one obtained in Experiment 1a ($M = .62$) after a 24 hour delay. It is possible that performance on the immediate test was not higher than the delayed test because of the increase in the number of questions asked in the present study. This suggestion is possible given that the 'remember seeing' instruction did not increase the quantity of information reported.

In contrast, the analysis of the proportion of accurate responses by means of a two-way, repeated measures ANOVA confirmed the experimental prediction and the

effectiveness of a 'remember' instruction to response accuracy ($F(1, 90) = 9.61$, $MSE = .866$, $p < .025$). This result supported the data obtained in Experiment 1a in which recall accuracy was higher for remember-based recollections than 'know' based ones. Accuracy was equivalent for central and peripheral details in the present study ($F(1, 90) = 1.55$, $MSE = .04$, $p > .05$). These results were identical to those reported in Experiment 1a. The interaction between the two variables was non-significant ($F(1, 90) < 1$, $MSE = .02$, $p > .05$).

Confidence in Responses

A three-way, repeated measures ANOVA evaluated the effects of instruction, detail, and accuracy to confidence. There was no overall effect of instructions to confidence ($F(1, 71) < 1$, $MSE = .438$, $p > .05$) but participants expressed more confidence in reporting central than peripheral details ($F(1, 71) = 51.92$, $MSE = 6.54$, $p < .001$). Accurate answers attracted higher confidence ratings than inaccurate answers ($F(1, 71) = 151.36$, $MSE = 36.30$, $p < .001$). The interactions between instruction and detail ($F(1, 71) < 1$, $MSE = .61$, $p > .05$) and instruction and accuracy ($F(1, 71) = 3.31$, $MSE = .80$, $p > .05$) were non-significant. The interaction between accuracy and detail was significant ($F(1, 71) = 20.02$, $MSE = .96$, $p < .001$). Analysis of the simple main effects revealed that the difference between confidence in recalling accurate and inaccurate central details ($t(78) = 13.13$, $p < .001$), was higher than the difference in confidence when recalling accurate and inaccurate peripheral details ($t(79) = 6.91$, $p < .001$). Although confidence was higher for accurate central detail answers, the interaction between accuracy and detail was further qualified by a significant three-way interaction between instruction, accuracy and detail ($F(1, 71) = 5.26$, $MSE = .18$, $p < .025$). Exploration of the simple main effects indicated that the 'remember' instruction increased confidence more than the 'non-directive' instruction for accurate peripheral details recalled ($t(85) = 2.09$, $p < .05$) than inaccurate peripheral details recalled ($t(83) = 1.09$, $p > .05$). This is displayed in Figure 11.3.2 on the next page.

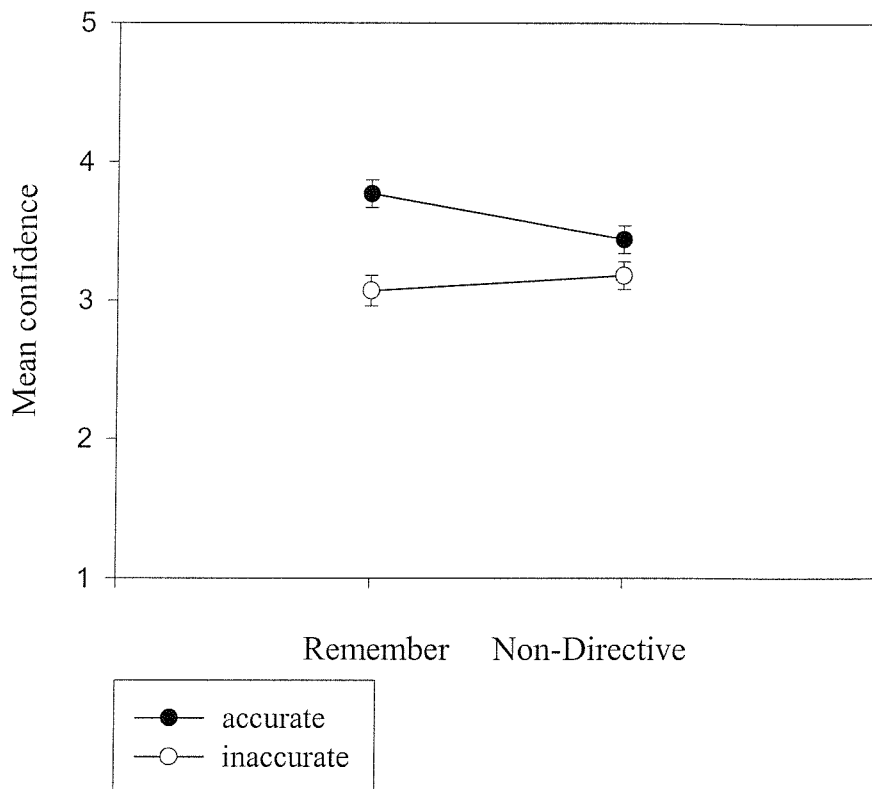


Figure 11.3.2 The interaction between instruction, detail and accuracy on confidence, with standard error bars.

Confidence-Accuracy Association

The CA gamma correlation was computed in the same way as described in Experiment 1a, and the mean correlations are summarised across instruction and detail in Table 11.3.3 along with the results of a one-sample t-test of the mean. All correlations were significant; however, in Experiment 1a, significant correlations were obtained for central and peripheral details classified as 'remembered' at retrieval. It appeared that CA processing was more reliable after an immediate memory test than after a 24 hour interval. An overview of the data revealed high CA correlations across all conditions. These correlations ranged from .36 to .71 across the experimental conditions ($M = .58$) and the mean was higher than the mean of (.23) obtained after a 24 hour delay (Experiment 1a). The mean CA correlation

obtained in the present study was similar to the those reported in the literature. Robinson and Johnson (1996), Robinson et al. (1997), and Hollins and Perfect (1997) obtained mean gamma correlations of (.58), (.58) and (.64) respectively. The correlations displayed in Table 11.3.3 did not appear to vary across instruction type, but they were higher for central than peripheral details.

Table 11.3.3 : *Mean confidence-accuracy gamma correlation (and standard deviations) across instruction and detail.*

	Central Details	Peripheral Details
Non-directive Instruction	.71 (.11)	.36 (.13)
Remember Instruction	.69 (.10)	.55 (.14)

(All gamma correlations were significantly greater than zero at $p < .001$.)

The effects of instruction and detail on the CA correlations were analyzed using a two-way, repeated measures ANOVA. Contrary to the experimental prediction, there was no effect of instruction type to the strength of the CA gamma correlation ($F(1, 70) < 1$, $MSE = .222$, $p > .05$). Confidence-accuracy predictions proved to be more reliable for central than peripheral detail memory ($F(1, 70) = 18.21$, $MSE = 4.06$, $p < .001$), a confirmation of the experimental prediction. The interaction between the two variables was not significant ($F(1, 70) = 3.79$, $MSE = .845$, $p > .05$).

11.4 Discussion

Experiment 3a evaluated the extent to which a 'remember' pre-test instruction facilitates recall accuracy, confidence and the CA correlation in the same way that a 'remember' retrieval state enhanced recall accuracy, confidence and the CA correlation (Experiment 1a). Recall for the central and peripheral details of an eye-witnessed event was measured immediately after the stimulus material was presented. The discussion summarises the impact a 'remember' instruction had on confidence-accuracy resolution. The implications of the data were assessed in light of the theories outlined in Chapter One and the evidence obtained in Experiment 1a.

The effectiveness of a 'remember' instruction to the CA association

Recall accuracy

Although the remember instruction did not improve the quantity of information reported, it led to an increase in the number of correct details given as well as the proportion of accurate responses given. In contrast, the quantity of information reported, number of correct details and the proportion of accurate responses were accompanied by a remember retrieval state in Experiment 1a. The mean proportion of accurate responses in the present study, across the experimental conditions, was .61 which was similar to the mean of .62 obtained in Experiment 1a. However, given the differences in terms of the reduced number of questions asked as well as the delayed memory test employed in Experiment 1a, conclusive comparisons across the two experiments cannot be made about eyewitness memory for remember-based retrieval.

Nevertheless, poor eyewitness memory is attributed to, among other factors, the delay in testing (Payne et al., 1996). The results can be interpreted in another way. There was no evidence that participants are worse at recalling events after 24 hours. However, in terms of the delays participants experience in the courts, a 24 hour retention interval is not lengthy. Recall errors are attributed to problems in the encoding, storage and retrieval of information (Sporer, Kohnken & Malpass, 1996), the lack of appropriate retrieval cues (Tulving, 1983) or optimal retrieval conditions (Deffenbacher, 1980; Leippe, 1980), and the influence of reconstructive recollections (Johnson et al., 1993; Schacter et al., 1998). The results of Experiment 3a were consistent with these explanations because recall accuracy was significantly higher for those participants who were told to report only what they can 'remember seeing or hearing' in their mind of the eye-witnessed event, than those persons who were given the 'non-directive' instruction.

Tulving outlined the importance of re-experiencing events in ensuring the accuracy of memories (Tulving, 1983, 1985). The processing of re-experiencing an incident through mental reinstatement brings to mind the relevant and contextual details associated with the event, so a richer description is provided. For example, when participants were questioned about a peripheral detail, 'What were the chasers in the film clip wearing?', the individuals given the 'remember' instruction were more accurate in reporting that the chasers wore suits. These participants went on to correctly describe the colour of the suits worn by each

of the three chasers and to mention that the chasers also wore hats. So the 'remember' instruction appears to promote the reporting of information that is associated with a mental imagery state.

As in Experiment 1a, the proportions of accurate central and peripheral details were reported equally well. Interesting, in the present study the total number of questions answered, the total number of accurate questions given as well as the total number of incorrect responses, were made in relation to central detail questions. Attentional focus theory and the SAM model claim that accuracy is contextually dependent, particularly on the strength of the memory trace compared to other traces. Consequently, central details are attended to and are better recalled than peripheral details. Eyewitness memory is reported to be better for central than peripheral details (e.g., Heath et al., 1997), so there some evidence of this in the present study, although not in relation to the proportion of accurate responses witnesses gave. The results are forensically relevant because the police require all information associated with an eye-witnessed event. The ability of a witness to report the central, salient details and the minutiae, peripheral details increases the value of a witness's testimony.

Confidence

Participants displayed good meta-memory skills because they were more confident when they provided accurate than inaccurate responses. Similar results were obtained by Johnson et al. (1997). There was partial support for the experimental prediction, which was based on the results of Experiment 1a, that confidence would be higher for information participants remembered. A significant three-way interaction between instruction, detail and accuracy emerged in which the 'remember' instruction boosted confidence in accurate peripheral detail answers, more than the 'non-directive' instruction. Given the predictions of the SAM model, memory traces for the central details of an event should be stronger than the traces associated with peripheral details. Yet, it was unsurprising that a 'remember' instruction boosted confidence in accurate peripheral detail memory. This was due to the fact that the difference in confidence between accurate and inaccurate central detail answers was higher than the confidence between accurate and inaccurate peripheral detail answers. Hence, remembering had the greatest effect in boosting confidence for the weaker,

peripheral detail memory traces.

The confidence-accuracy association

A 'remember' state of awareness assisted participants in Experiment 1a to make more reliable CA judgements, but only for central detail responses. In the present study remembering did not facilitate CA resolution, and the possibility that the increase in the number of questions asked in this study may account for the results cannot be eliminated. CA resolution was more reliable for central than peripheral details. Taken together the results of Experiment 1a and 3a show more robust evidence that the centrality of the detail reported moderates the strength of the CA association.

Conclusion

In summary, there was mixed support for the benefits of a focussed 'remember' instruction when three types of performance measures were evaluated; recall accuracy, confidence and CA resolution. The 'remember' instruction enhanced recall accuracy for all information and it boosted confidence in accurate peripheral detail memory, more than the 'non-directive' pre-test instruction. However, the 'remember' instruction failed to improve the strength of the CA association. Instead, the magnitude of the CA association responded to the centrality of the information described. There were larger number of participants in each experimental condition in the present study, compared to Experiment 1a.

Consequently, there was more support for some of the results reported in Experiment 1a, although these comparisons must be treated with caution given the differences in the research design and stimulus material used in both studies. The data were consistent with many of the theoretical propositions outlined in Chapter One. Focussed retrieval instructions and post-retrieval monitoring reduce reconstructive memory and increase accuracy (Schacter et al., 1998) and an enhanced retrieval environment can recover weak memory traces (Mello & Fisher, 1996; Tulving, 1985). The next experiment examines the effectiveness of the enhanced 'remember' instruction in facilitated recognition accuracy for information that was initially inaccessible but which prompted a feeling of knowing (FOK).

CHAPTER TWELVE

Experiment 3b: The Relationship between State of Awareness Instructions and the Confidence-Accuracy Association for Feeling of Knowing Judgements

“Perhaps the subjective monitoring of knowledge is based on some special module that allows the person to monitor directly the availability in the memory store of a target that is not accessible.” (Koriat, 1998, p.18).

12.1 Introduction

The present study redressed the limitations of Experiment 1b, imposed by the mutually exclusive nature of the remember/know procedure. To recap, FOK performance in Experiment 1b was evaluated after a 24 hour delay. Participants gave an equivalent proportion of FOK responses, in relation to ‘don’t know’ responses, for unanswered central and peripheral detail questions. Feeling of knowing predictive accuracy ranged from .40 to .65 ($M = .52$) which was above chance performance (.25). So eyewitness FOK predictive accuracy was more reliable than previously reported in the literature (Perfect & Hollins, 1996; 1999, Experiment 1). The key finding was that accurate central detail answers were accompanied by a ‘know’ than a ‘remember’ retrieval state. The result was consistent with the view that FOK judgements are based on a sense of familiarity (Lories et al., 1998). There was no influence of retrieval state on confidence in recognition memory. The low number of valid cases in some of the experimental conditions in Experiment 1b, did not make it possible to examine two main research questions in the thesis; first, the effect of retrieval state to confidence; and second, the effect of retrieval state to the FOK-CA relationship.

These issues are examined in the present study when the state of awareness prior to retrieval is created by the nature of the pre-test instruction administered. Given the benefits to adult recall with the remember instruction (Experiment 3a), it was expected that the ‘remember’ instruction, may direct memory monitoring for a partial, or a related answer, to a question and so trigger a FOK. Additionally, it would continue the search for information that could not be spontaneously recalled. Hence an FOK judgement, rather than a ‘Don’t know’ response, would represent a belief that the target knowledge is stored in memory.

Participants in this study were the same as those in Experiment 3a, and the manipulation of instruction type followed the same procedure adopted in that experiment. One would expect that the memory monitoring required to provide an FOK judgement, would be more efficient with an immediate memory test than a test that was administered after 24 hours. Perfect and Hollins (1999, Experiment 2) showed undergraduates 2 non-violent crime scenarios each lasting between 40 to 120 seconds. Fifteen minutes later participants completed a recall test comprising 31 questions or gave a confidence rating in their FOK knowledge and attempted a recognition test. Participants were told not to guess on the recall test in order to increase the number of FOK predictions available to compute the FOK-CA gamma correlation. The design of this study matches the design of Experiment 3b but the FOK-CA gamma was computed in place of the FOK-recognition gamma. Perfect and Hollins obtained a mean proportion of predictive accuracy of (.35), with chance performance at 25 percent, and an unreliable FOK-recognition gamma correlation (.10). The data confirmed their earlier research with a 24 hour retention interval (Perfect & Hollins, 1996).

Given that eyewitness predictive accuracy is generally unreliable, regardless of the retention interval, improvements to recognition accuracy and the FOK-CA association should benefit from a 'remember' pre-test instruction.

12.2. Method

Design

The data were collected at the same time that Experiment 3a was conducted.

Participants

Participants were the same as those in Experiment 3a, and they retained the same instruction condition to which they were assigned in that experiment. To recap, 47 participant received a 'remember' instruction while 45 received a 'non-directive' instruction.

Materials

The stimulus material was identical to that used in Experiment 3a .

Questionnaire

Thirty one questions were created, the first of which was a practice question formed no part of the data analysis. A recognition version of the recall test administered in Experiment 3a was used and this was based on a four-alternative-choiced questionnaire. Specifically, for each recall item from Experiment 3a, 4 alternatives were generated, one of which was the correct answer. The position of the correct answer varied in the four alternative responses. Participants were instructed to circle one of the four options or the don't know option. The recognition test comprised 15 central and 15 peripheral detail questions.

Instructions

The instructions were written on the questionnaire and were identical to the ones used in Experiment 3a with the exception that participants were not required to make a feeling of knowing prediction.

The *remember* instruction was as followed.

"I am interested in what you can tell me about the video you have just watched. However, I want to make sure that what you tell me is as accurate as it can be. So, what I am asking you to do is to answer the following questions ONLY if you can truthfully say that you REMEMBER SEEING or HEARING the detail or details in question. If you think that you know the answer, but don't actually REMEMBER SEEING or HEARING the details, then please DO NOT answer the question. If you didn't see the details and really don't know the answer, then don't be afraid to indicate that you do not know the answer." Please don't guess and try to be as accurate as possible.

In the *non-directive* instruction, participants were instructed as followed:

"I am interested in what you can tell me about the video you have just watched. However, I want to make sure that what you tell me is as accurate as it can be. So, what I am asking you to do is to answer the following questions as truthfully as you can. If you really don't know the answer, do not guess, and do not be afraid to write on the questionnaire 'I do not know' ".

Procedure

The participants retained the groups to which they were assigned in Experiment 3a. They were given an immediate recognition test after completing the recall questionnaire (Experiment 3a). As explained in Experiment 1b, such as test-retest design may alter performance beyond the effects of the experimental manipulation, either through retrieval practice or retrieval induced forgetting (Fritz et al., 2000; Anderson, 1995). Individuals in the ‘remember’ and ‘non-directive’ instruction conditions were reminded of these instructions by having them outlined in the recognition questionnaire. Participants circled one of the four alternatives on the recognition test or the don’t know option. Participants rated their confidence in their answer by circling a number on a 5-point Likert Scale (where 1 = not very confident, and 5 = very confident). Participants were told not to discuss the task with one another and their performance was monitored by the researcher. The memory test was completed within 20 minutes.

12.3 Results

Feeling of knowing predictions

Participants made one of three responses in Experiment 3a; an answer, a ‘do not know’ response or a ‘feeling of knowing’ judgement. The proportion of feeling of knowing judgements was calculated from the number of FOK judgements/number of FOK +Don’t know responses. For each item on the recognition test, responses were classified as accurate, inaccurate or don’t know. However, the accuracy of responses on the recognition test was evaluated only for questions not answered on the recall test but for which a feeling of knowing judgement was made. The number of FOK predictions, accurate FOK responses, the proportions of FOK judgements and FOK accuracy, and the mean confidence in accurate and inaccurate FOK’s are displayed in Table 12.3.1 by instruction and detail. There were 64 valid cases and the effects of instructions and detail to FOK decisions, predictive accuracy, confidence and the FOK-CA correlations are examined separately.

Table 12.3.1: *Mean number of correct feeling of knowing (FOK) responses, proportion of FOK judgements and proportion of FOK accuracy across instruction and detail for adult witnesses, together with confidence ratings when accurate and inaccurate (and standard deviations).*

	Central Details		Peripheral Details	
	Non-directive	Remember	Non-directive	Remember
No. of correct FOK items	.31 (.56)	.36 (.49)	.96 (1.19)	.85 (1.35)
No. of FOK predictions	.73 (.99)	.79 (1.08)	1.82 (1.72)	1.49 (2.08)
Proportion FOK judgments	.46 (.17)	.38 (.13)	.37 (.16)	.31 (.16)
Proportion FOK accuracy	.52 (.12)	.58 (.10)	.54 (.11)	.76 (.18)
Confidence Accurate FOKs	3.25 (.13)	3.71 (.21)	2.71(.12)	2.76 (.13)
Confidence Inaccurate FOKs	2.65 (.13)	3.09 (.11)	2.24 (.06)	2.44 (.05)

The Proportion of Feeling of Knowing Judgements

The results of a two-way, repeated measures ANOVA revealed that neither instructions ($F(1, 62) < 1$, $MSE = .171$, $p > .05$) nor detail ($F(1, 62) = 2.989$, $MSE = .211$, $p > .05$) had any significant effect on participants' FOK judgements. The interaction between the two variables was non-significant ($F(1, 62) < 1$, $MSE = .002$, $p > .05$). Consequently, the experimental predictions were not confirmed. In Experiment 1b, unanswered central and peripheral details triggered the same proportion of FOK judgements.

Proportion of Feeling of Knowing Accuracy

The proportion of FOK accuracy was calculated from the recognition answers (Experiment 3b) in response to the FOK judgements made on the recall test (Experiment 3a). Proportion of FOK accuracy = Accurate Recognition Responses/Total recognition responses (accurate + inaccurate). The proportion of accurate responses ranged from .52 to .76 across the experimental conditions ($M = .60$), and the mean was higher than the one obtained in Experiment 1b, ($M = .52$), when memory was tested 24 hours after the event was presented. A two-way, repeated measured ANOVA was conducted and the results patterned the data reported in the preceding section. Contrary to experimental predictions neither instructions ($F(1, 29) = 1.766$, $MSE = .301$, $p > .05$) nor detail ($F(1, 29) < 1$, $MSE = .158$, $p > .05$)

had any significant effect on participants' FOK judgements. The interaction between the two variables was non-significant ($F(1, 29) < 1$, $MSE = .108$, $p > .05$). FOK accuracy for central details recognised in Experiment 1b was accompanied by a 'know' than 'remember' retrieval state.

Confidence in Accurate Feeling of Knowing Responses

There were insufficient cases to conduct a three-way, repeated measures ANOVA to examine the effects of instructions, detail and response accuracy on confidence in FOK responses. A two-way, repeated measures ANOVA evaluated the effects of instructions and detail on the confidence levels of accurate responses. Participants were equally confident in their responses when given the 'remember' and 'non-directive' instructions ($F(1, 17) > 1$, $MSE = .321$, $p > .05$). Similarly, accurate central and peripheral detail responses attracted equivalent confidence ratings ($F(1, 17) = 2.397$, $MSE = 2.383$, $p > .05$). The interaction between both variables was non significant ($F(1, 17) > 1$, $MSE = .947$, $p > .05$). The experimental predictions were unsupported.

FOK- Confidence-Accuracy Association

Gamma correlations for each individual were calculated using the method discussed in Experiment 1b. The mean correlations ranged from .02 to .33 across the experimental conditions ($M = .17$). A one-sample t-test of the means indicated that none of the correlations was significantly different from zero. These are displayed in Table 12.3.2. An ANOVA analysis reduces the number of valid cases for analysis so a Mann-Whitney Test was conducted to examine the effect of instruction on the FOK-CA central and peripheral detail association. There was no significant difference between the 'remember' and the 'non-directive' instruction to the FOK-CA central detail correlation ($z = .39$, $p > .05$). The mean (and sum) of the ranks associated with the 'non-directive' instruction was 4.00 (8.00), while the mean of the ranks associated with the 'remember' instruction was 4.67 (28.00). Similarly, there was no significant difference between the 'remember' and the 'non-directive' instruction to the FOK-CA peripheral detail correlation ($z = .67$, $p > .05$). The mean (and sum) of the ranks associated with the 'non-directive' instruction was 9.55 (105.00), while the mean of the ranks associated with the 'remember' instruction was 8.00

(48.00). The result must be treated with caution because of the limited number of participants in some conditions, hence only the most powerful differences were expected to occur.

Table 12.3.2: *Mean confidence-accuracy gamma correlations following FOK judgements (and standard deviations) across instructions and detail.*

	Central Details	Peripheral Details
'Non-directive' instruction	.02 (.21)	.27 (.21)
'Remember' instruction	.33 (.13)	.06 (.15)

(All gamma correlations were significantly greater than zero at $p < .001$.)

12.4 Discussion

Experiment 3b assessed the effects of a 'remember' pre-test instruction in prompting FOK judgements, and influencing predictive accuracy, confidence and the FOK-CA association. These issues were consistent with the main theme of Part Two of the thesis, which was to examine the influence of instruction type in facilitating memory monitoring in general. This study examined memory monitoring for non-recollective, FOK experiences. The data are discussed in relation to the theoretical explanations underlying FOK experiences and evidence from the published literature. Differences in the delay of the memory test and the number of questions asked of participants in Experiment 1b and the present study made it difficult to compare the results of the two studies although similarities in the findings are mentioned.

FOK judgements

When a person is unable to answer a question, how does that individual become aware that the target knowledge is nevertheless available? The 'accessibility' hypothesis (Koriat, 1993, 1995, 1998) contends that FOK decisions are driven by the ease with which a search for the target or related material can occur. This retrieval 'ease' is in turn determined by the nature, amount and strength of the memory trace (Koriat, 1993), the domain of knowledge or insights into performance (Perfect & Hollins, 1996), and the degree of detail or vividness

of the cues in a question. Given the central/peripheral detail differential used in this study, one would expect that detail type would influence the FOK experience in two ways. First, the strong memory traces underlying central details should prompt more FOK judgements than 'don't know' ones. Second, if recall accuracy was better for central detail memory in Experiments 1a and 3a, then there is more scope for improving memory for peripheral detail knowledge with a recognition test. The data from Experiments 1b and 3b did not conform to either of the expectations. When attempting a recall test after 24 hours, FOK judgements were equivalent for unanswered central and peripheral detail questions (Experiment 1b). The same result was obtained in this study. It appears that trace strength is unrelated to an FOK experience, although more research is needed to confirm this result. An explanation for participants' FOK performance may be gleaned from their recall accuracy in Experiments 1a and 3a. In both studies accuracy was unrelated to detail type. Consequently, it is perhaps not surprising that FOK experiences were also unrelated to detail.

Instruction and FOK predictive accuracy

The proportion of accurate FOK responses ranged from .52 to .76 across the experimental conditions ($M = .60$). This was higher than chance performance (.25), and marginally lower than the mean proportion of accurate FOK responses of (.62) reported by Perfect and Hollins (1999, Experiment 2). In the study by Perfect and Hollins, chance performance was also 25 percent. Both sets of data give credence to the statement that the accuracy of FOK judgements is well above chance but far from perfect (Leonesio & Nelson, 1990). Nevertheless, participants displayed good memory monitoring across all experimental conditions. When the data were compared with adults' FOK performance in Experiment 1b, in which the mean proportion of predictive accuracy was (.52), accuracy was higher following an immediate test than a later one. There was no evidence that attempts to encourage retrieval by administering a 'remember' pre-test instruction improved FOK recognition accuracy. This result was consistent with the data reported in Experiment 1b. In that study, participants were more accurate when they recognised answers they 'knew' than 'remembered'. Based on the data obtained in the thesis so far, there seems to be a stronger case that FOK experiences are based on a sense of familiarity (Lories et al., 1998),

than a sense of ‘remembering’ partial information as predicted in the dual process framework (Koriat & Levy-Sadot, 1999).

The accessibility hypothesis (Koriat, 1993, 1995) links the strength of a memory trace to FOK experiences. However, there was no overall effect of detail type on FOK accuracy in the present study. This contrasts with evidence that the characteristics of the target information, such as expertise or domains of knowledge, determine FOK accuracy (Huet & Marquie, 1999; Penyircioglu & Tekcan, 2000, Experiment 1; Perfect & Hollins, 1999).

The FOK-CA Association

Confidence in accurate responses was equivalent regardless of the nature of the pre-test instruction administered or the type of detail reported. This was identical to the results obtained in Experiment 1b. In contrast, Perfect and Hollins (1999, Experiment 3) found that confidence in FOK eyewitness recognition memory was higher for answers that came quickly or vividly to mind or responses that were accompanied by contextual details.

The FOK-CA gamma correlations failed to reach significance in all the experimental conditions, an indication that participants were equally confident when they were accurate and inaccurate. Perfect and Hollins obtained an FOK-recognition gamma of (.10) and concluded that witness FOK recognition memory was unreliable. The mean FOK-CA in this study was (.17) so CA resolution was also unreliable. In Experiment 1b, the FOK-CA was statistically significant from zero for peripheral detail ‘known’.

Conclusion

Feelings of knowing are based on impressions of information accessibility, but not information accuracy. Consequently, FOK-recognition correlations are often weak. The accuracy of metamemory is a product of the accuracy of memory (Izaute & Lories, 1999), implying that when memory fails, meta-memory also suffers. In the introduction to this experiment it was expected that the ‘remember’ pre-test instruction would facilitate FOK decisions, FOK predictive accuracy and the FOK-CA correlation. This was based on claims that increasing information accessibility (Koriat, 1995) and contextual knowledge

(Nelson et al., 1984), would increase the awareness of FOK experiences and the reliability of these decisions. The data failed to support these expectations and despite the differences in the experimental design used in Experiment 1b and the present study, the results were identical.

Alternatively, the data conformed to a memory monitoring dilemma outlined by Lories et al. (1998). They explained the difficulties in searching for a specific item of information that is unretrievable, but known to be stored. The search for this information is directed by the cues in the question relating to the topic or domain of knowledge. Lories et al. said that trying to estimate the success in retrieving partial or related information that may be related to a target question, presents an individual with a 'bootstrap' dilemma. They questioned, how can you know whether you know an answer before you retrieve it? How can you know if the retrieved information is in fact the answer? Data from the present study revealed that asking participants to report only what they 'remembered seeing or hearing' does not guarantee efficient internal memory monitoring or accessibility to FOK experiences. Consequently, FOK accuracy and reliable FOK-CA judgements are not improved by the retrieval instruction. Given the importance of eyewitness memory, and the weight given to witnesses' claims that they possess knowledge that they are unable to spontaneously recall, further research is needed to identify the conditions that will lead to reliable FOK monitoring and FOK-CA processing. In the next experiment the effectiveness of the enhanced 'remember' pre-test instruction is measured for its contribution to recognition accuracy and confidence-accuracy resolution because this instruction significantly improved recall accuracy (Experiment 3a).

CHAPTER THIRTEEN

Experiment 3c: The Relationship between State of Awareness Instructions and Confidence-Accuracy Judgements following Immediate Recognition

“Accurate memory for a particular prior experience requires selection of a requested information from among all the other information in memory and thus, memory must be highly discriminative.” (Smith & Hurd, 2000)

13.1 Introduction

When participants in Experiment 1c were asked to discriminate between responses they ‘remembered’ and ‘knew’, the state of awareness accompanying retrieval was unrelated to recognition accuracy when this was measured as the proportion of accurate responses. However, remembering was associated with an increase in both the quantity of information recognised as well as the number of correct answers recognised. While a ‘remember’ retrieval state did not assist witnesses to give higher confidence ratings to accurate answers, than a ‘know’ retrieval state, accurate central details remembered were expressed more confidently than inaccurate central details remembered. More importantly, confidence in recognition accuracy was higher for peripheral than central details ‘known’. This led to better CA correlation for peripheral details known. Therefore, there is merit in examining the role of a remember retrieval instruction to recognition memory and confidence on an immediate memory test.

Koriat and Goldsmith (1996) believe that when it is not possible for individuals to improve the quality and accuracy of the information retrieved, they can control what is reported. Therefore, it was expected that encouraging a ‘remember’ retrieval state prior to recognition, would facilitate recognition memory in the same way as it assisted recall (Experiment 3a). This expectation was premised on claims that metacognition is inextricably related to awareness (Lories et al., 1998). It suggests that making individuals more aware of the contents of their knowledge, and the need to verify statements by reporting ‘only what was remembered’, would enhance metamemory performance. Such a strategic regulation of the contents of memory would increase the accuracy and quality of responses, and significantly improve recognition accuracy, confidence and the CA

association, more than a 'non-directive' instruction.

There is a substantial body of evidence that accuracy and confidence are better when conditions at encoding and retrieval are optimal (Deffenbacher, 1980; Lindsay, Read & Sharma, 1998). For example, an immediate test of memory (Wright, Self & Justice, 2000) and an increase in the number of retrieval cues (Frost & Weaver, 1997, Experiment 1), improves eyewitness recognition accuracy. Recognition involves accurately discriminating between the target and the 'alternative' answers listed in a questionnaire. While the contextual cues present in these alternative answers facilitate accuracy, it does not have the same benefit for CA resolution. Robinson and Johnson (1996) found that although the recognition accuracy for eyewitness memory was higher than recall accuracy, the CA correlation was lower when performance was measured on a recognition test (.49), than a recall test (.58). Other studies concluded that the CA correlation based on recognition memory was either unreliable (Perfect et al., 1993), or weak (Scogin, Calhoun & D'Errico, 1994). Perfect et al., obtained a CA correlation of (-.03).

Weak correlations imply over-confidence in performance. The issue of overconfidence is an important one because post-event questioning increases confidence in incorrect answers (Shaw, 1996). Given the results obtained by Perfect et al. (1993), it appears that the alternative answers on a recognition test provide post-event material that could be incorporated into memory and boost confidence in performance unnecessarily. Other researchers conclude that witnesses are often overconfident in their ability (Smith et al., 1989; Sporer et al., 1995). However, requesting participants to report only what they can remember seeing in their mind of the original event is expected to bring confidence in line with accuracy, because of the richness and reinstatement underlying the memorial experience.

The importance of accessing the contextual details surrounding some target knowledge cannot be underestimated (Morris & Gruneberg, 1994; Joyner & Kurtz-Costes, 1998). Of particular interest in the present study are the benefits to accuracy, confidence and CA resolution. Any attempt to direct witnesses' retrieval for some specific target detail by highlighting the importance of what they can 'see and hear' of the context surrounding that incident, will greatly improve memory and metamemory performance. A focussed 'remember' instruction has the potential for increasing recognition accuracy, confidence

and CA correlation than the ‘non-directive’ instruction. The second prediction, given the evidence obtained in Experiment 3a and the explanation contained in the SAM model for recognition memory, is that stronger central detail memory traces will result in more accurate central than peripheral detail responses.

13.2 Method

Design

The experimental design was identical to that used in Experiment 3a.

Participants

Sixty-one participants (50 women, 11 men) ranging in age from 17 to 41 years, ($M = 21$ years), participated in the study. Twenty-five psychology A’Level students were recruited from Barton Pervil College, Eastleigh and a similar amount of A’Level sociology students from Itchen College, Southampton took part in the experiment. Eleven undergraduate psychology students from the University of Southampton participated in return for 2 research credits. Individuals were randomly assigned to one of the two instruction conditions, with gender balanced as far as possible across the two groups. Group One ($n = 30$) received a ‘remember’ instruction while Group Two ($n = 31$) received a ‘non-directive’ instruction which avoided reference to reporting only what participants ‘remembered seeing or hearing’.

Materials

To-be-remembered event:

The stimulus material was identical to that used in Experiment 3a.

Questionnaire:

The questionnaire was identical to the one used in Experiment 3b.

Instructions

The instructions were written on the test questionnaire and were identical to the ones used in Experiment 3b.

Procedure

Participants were asked to watch a film clip, after which they completed a recognition test. Participants circled one of the four alternatives on the recognition test or the don't know option. If an alternative was chosen, participants rated their confidence in their choice by circling a number on a 5-point Likert Scale (where 1 = not very confident, and 5 = very confident). Participants were told not to discuss the task with one another and their performance was monitored by the researcher. The memory test was completed within 25 minutes.

13.3 Results

Eyewitness Recognition

The data analysis was identical to that outlined in Experiment 3a. For each item on the recognition test responses were categorized as either accurate, inaccurate, or don't know. The responses to the questions were scored in a 'blind' fashion; that is, regardless of the type of detail reported. This was done to prevent any bias in the data analysis. Table 13.3.1 displays participants' performance and confidence ratings, across central and peripheral details, for the 'remember' and 'non-directive' instructions.

Total number of questions answered. The focus on analysing accuracy risks missing differences in the overall level of eyewitness responses. Hence, the total number of questions participants answered was calculated and this gives an indication of the total amount of information pertaining to an eye-witnessed event that can be immediately recognised. Thirty questions were asked and the mean number of questions answered and (standard deviation) were 27.13 (3.62). Participants recognised 90 percent of what they saw compared to 75 percent of the information they recalled in Experiment 3a. The number of questions answered, out of 30, when participants were given the 'remember' and 'non-directive' instructions were 25.20 and 29.00 respectively. It appears that the 'remember' instruction made participants more conservative in responding to questions. Alternatively, the cues present on the recognition test perhaps may elicited information that was also 'remembered'.

A two-way, repeated measures Analysis of Variance (ANOVA) assessed the effects of instructions and detail to the total number of questions answered. The non-directive

instruction was associated with a higher number of questions answered than the ‘remember seeing’ instruction ($F(1, 59) = 23.00, MSE = 110.08, p < .001$). More central than peripheral detail questions were answered ($F(1, 59) = 40.31, MSE = 69.20, p < .001$). The interaction between the two variables was significant ($F(1, 59) = 14.18, MSE = 24.35, p < .001$). Subsequent analysis of this interaction by means of an independent samples t-test revealed that the non-directive instruction had the greatest effect on the number of peripheral ($t(59) = 4.64, p < .001$) than central detail questions answered ($t(59) = 3.98, p < .001$). The means (and standard deviations) are cited in the first row of the data in Table 13.3.1 while the interaction is depicted in Figure 13.3.2.

Table 13.3.1. *Mean number of questions answered, correct responses, incorrect responses, don't know responses and proportion accuracy across instruction and detail for adult witnesses, together with confidence ratings when accurate and inaccurate (and standard deviations).*

	Central Details		Peripheral Details	
	Non-directive	Remember	Non-directive	Remember
No. of questions answered	14.81 (.54)	13.80 (1.30)	14.19 (1.85)	11.40 (2.77)
No. of correct responses	10.81 (1.94)	10.73 (1.51)	8.65 (1.84)	8.30 (2.28)
No. of incorrect responses	4.00 (.34)	3.07 (.30)	5.55 (.31)	3.37 (.38)
No. ‘don’t know’ responses	.19 (.54)	1.20 (1.30)	.77 (1.80)	3.60 (2.77)
Proportion Accurate	.73 (.10)	.78 (.02)	.61 (.08)	.71 (.14)
Confidence when accurate	4.16 (.09)	4.37 (.08)	3.41 (.03)	3.87 (.05)
Confidence when inaccurate	3.12 (.13)	3.49 (.13)	2.56 (.13)	3.05 (.16)

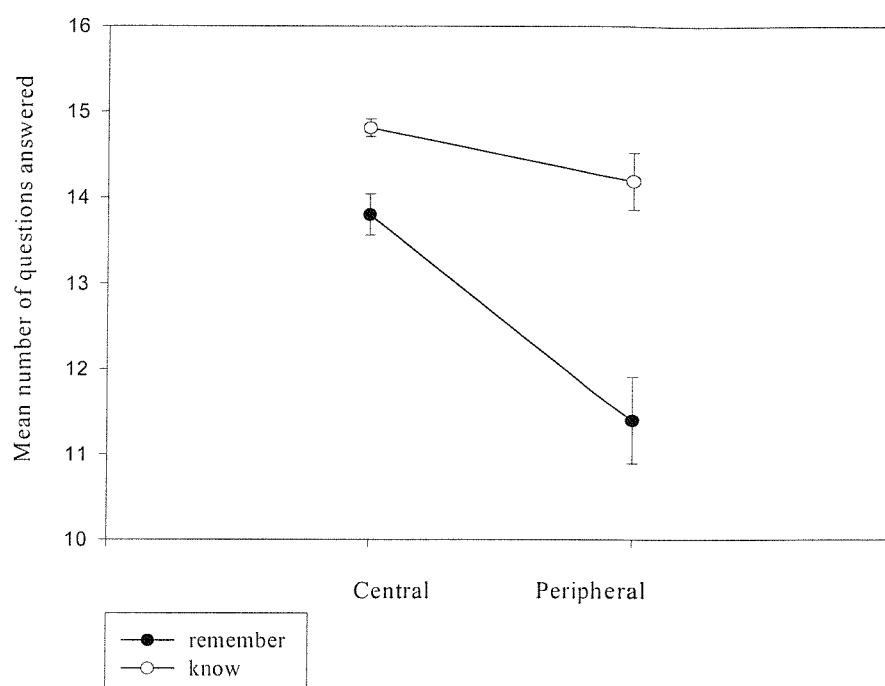


Figure 13.3.2. Interaction of instruction and detail on the mean number of questions answered, with standard error bars.

Number of correct responses. The mean number of questions participants correctly answered was 19.11, or 64 percent, of the 30 questions asked. A two-way, repeated measures (ANOVA) of the mean total correct responses by instruction and detail revealed no significant effect of instruction type to the number of correct responses ($F(1, 59) < 1$, $MSE = 3.58$, $p > .05$). There were more accurate central than peripheral details ($F(1, 59) = 80.98$, $MSE = 180.15$, $p < .001$). The interaction between instruction and detail was non-significant ($F(1, 59) < 1$, $MSE = 2.21$, $p > .05$). The mean numbers of correct responses across instruction and detail were summarised in the second row of Table 13.3.1.

The mean number of incorrect responses was 8 or 27 percent of the questions asked. The mean number of incorrect responses across experimental conditions were listed in the third row of the data in Table 13.3.1. An ANOVA analysis to evaluate the effects of instruction and detail on the mean number of incorrect responses revealed that the non-directive instruction led to a high number of inaccurate answers ($F(1, 59) = 15.02$, $MSE = 73.97$, $p < .001$). There was more incorrect peripheral than central detail answers ($F(1,$

59) = 14.50, $MSE = 26.04$, $p < .001$). The interaction between the two variables was significant ($F(1, 59) = 6.61$, $MSE = 11.88$, $p < .025$). Subsequent exploration of the main effects by means of an independent sample t-test revealed that the non-directive instruction resulted in more inaccurate peripheral ($t(59) = 4.67$, $p < .001$) than central detail ($t(59) = 2.08$, $p < .05$) answers. This is displayed in Figure 13.3.3.

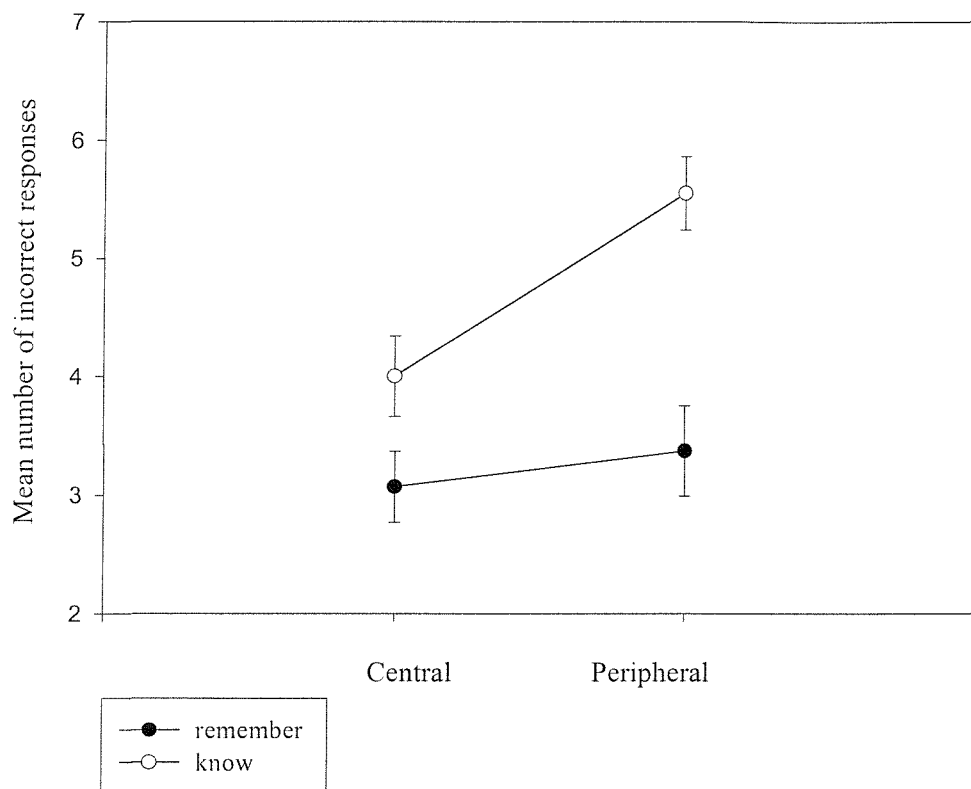


Figure 13.3.3: Interaction between instruction and detail on the mean number of incorrect responses, with standard error bars.

Separate analyses were conducted to examine the effects of instruction and detail on the proportion of accurate responses, confidence, and the confidence-accuracy association. The results are presented in turn below.

Proportion of Accurate Responses

The proportion of accurate responses ranged from .61 to .78 ($M = .71$), and this was

marginally higher than the mean proportion of accurate responses of (.69) obtained after a retention interval of 24 hours (Experiment 1c). However, as discussed in Experiment 3a, the increase in the number of questions asked in this study compared to Experiment 1c possibly reduced participants' recognition performance on the immediate test. Performance in the present study was above chance performance (.25) in all the experimental conditions. Analysis of the proportion of accurate responses by means of a two-way, repeated measures ANOVA confirmed the benefits of the 'remember' instruction to recognition accuracy ($F(1, 59) = 7.68, MSE = 1782.91, p < .001$). Central details were recognised more accurately than peripheral details ($F(1, 59) = 28.68, MSE = 2672.74, p < .001$). The interaction between the two variables was non-significant ($F(1, 59) = 1.99, MSE = 185.83, p > .05$). Both experimental predictions were supported. The data extended the benefits of a 'remember' instruction observed for recall accuracy (Experiment 3a) to recognition (Experiment 3c). However, a central detail accuracy bias did not occur when a recall test was administered (Experiment 3a). The results of this study were more optimistic than those obtained in Experiment 1c, in which recognition accuracy was equivalent during 'remember' and 'know' retrieval states.

Confidence in Responses

A three-way, repeated measures ANOVA examined the effects of instruction, detail, and accuracy on confidence. The 'remember' instruction increased confidence in reports ($F(1, 56) = 7.62, MSE = 8.54, p < .001$). Participants were more confident when answering central than peripheral detail questions ($F(1, 56) = 86.57, MSE = 18.36, p < .001$) and they were more confident when they were accurate than inaccurate ($F(1, 56) = 182.59, MSE = 46.31, p < .001$). The interactions between instruction and detail ($F(1, 56) = 2.23, MSE = .42, p > .05$), instruction and response accuracy ($F(1, 56) < 1, MSE = .12, p > .05$), detail and response accuracy ($F(1, 56) = 1.15, MSE = .24, p > .05$), and instruction, detail and response accuracy ($F(1, 56) < 1, MSE = .06, p > .05$) were non-significant. In contrast, the 'remember' instruction had a selective effect on confidence during recall (Experiment 3a); it boosted confidence in accurate peripheral details. When the state of awareness at retrieval was measured in Experiment 1c, participants were more confident in reporting peripheral, than central details they knew.

The Confidence-Accuracy Association

The confidence-accuracy association was computed using the procedure described in Experiment 1a. The CA correlations ranged from .46 to .72 ($M = .62$) and this was higher than the correlation of (.58) obtained during recall (Experiment 3a). A one-sample t-test of the mean revealed that all the correlations were significant. The data are summarized in Table 13.3.4 across instruction and detail. An overview of the data revealed high CA correlations in all the experimental conditions. The CA correlations for central details were higher than the CA correlations for peripheral details, in both the 'remember' and 'non-directive' instruction conditions. This was consistent with earlier predictions for better central detail memory and meta-memory.

Table 13.3.4 *Mean confidence-accuracy gamma correlation (and standard deviation) across instruction and detail.*

	Central Details	Peripheral Details
'Non-directive' Instruction	.70 (.10)	.46 (.04)
'Remember' Instruction	.72 (.08)	.61 (.06)

(All gamma correlations were significantly greater than zero at $p < .001$.)

The effects of instruction and detail on the confidence-accuracy correlations were analysed using a two-way, repeated measures ANOVA. Instruction type had no significant effect on the strength of the CA correlation ($F(1, 56) = 1.367$, $MSE = .204$, $p > .05$). However, the CA correlation was sensitive to the centrality of the details recognised with higher CA correlations for central than peripheral details ($F(1, 56) = 7.684$, $MSE = .820$, $p < .001$). The interaction between the two variables was non-significant ($F(1, 56) < 1$, $MSE = .106$, $p > .05$).

13.4 Discussion

Experiment 3c investigated the effectiveness of a focussed 'remember' pre-test retrieval instruction to recognition accuracy, confidence and the reliability of confidence-accuracy decisions. As in Experiment 3a, memory for the central and peripheral details of an eye-witnessed event were evaluated. The results are discussed in relation to the theories outlined in Chapter One, and the results obtained in Experiments 1c and 3a.

The effectiveness of a 'remember' instruction to the CA association

Recognition accuracy.

The effect of the retrieval instruction on eyewitness memory depends on the type of performance that is evaluated. Although the non-directive instruction produced more responses to questions than the remember-seeing instruction, it led to more peripheral than central detail responses. In contrast, retrieval instruction had no effect on the number of questions participants recalled (Experiment 3a). The nature of the pre-test instruction had no significant effect on the number of accurate answers given in this study. However, the non-directive instruction resulted in more incorrect responses than the remember seeing instruction, particularly when participants answered peripheral detail questions. Given these results there is an advantage in asking witnesses to report only what they remembered seeing and hearing. The effectiveness of remembering in reducing the number of false reports witnesses give appears to be better for recognition than recall as the number of incorrect responses was higher with remember than the non-directive instruction in Experiment 3a.

The primary measure of performance related to the proportion of accurate response, confidence and the CA association. The mean proportion of accurate responses across the experimental conditions was .71 which was higher than the mean proportion of accurate responses obtained for recall ($M = .61$) under similar conditions (Experiment 3a). The data were consistent with evidence that recognition memory is better than recall (Robinson & Johnson, 1996; Johnson et al., 1997). The key finding was that the 'remember' instruction significantly improved recognition accuracy more than the 'non-directive' instruction, a confirmation of the benefits of mental context reinstatement (Tulving, 1985), focussed retrieval (Norman & Schacter, 1996) and contextual knowledge (Joyner & Kurtz-Costes, 1998) to performance. The data extended the benefits to eyewitness memory derived by administering a 'remember' instruction from recall (Experiment 3a), to recognition. There are limitations in comparing the data from Experiment 1c and 2c because of differences in the research design and the number of questions on the memory test. Nevertheless, adult recognition accuracy in Experiment 1c was related to the state of awareness accompanying retrieval. Taken together, the evidence suggest that encouraging witnesses to revive or reinstate an experience prior to reporting it, improves accuracy.

The effect of detail type to performance depended on the aspect of performance discussed. For example, overall more central than peripheral detail questions were answered although more peripheral detail questions were answered by participants who were given the non-directive instruction. The number of accurate central details was higher than the number of accurate peripheral details. Conversely, the number of inaccurate peripheral detail responses was higher than the number of inaccurate central detail responses. This was more likely to follow a non-directive than a 'remember seeing' instruction. The main finding in this study was a higher proportion of accurate central than peripheral detail responses.

The central detail accuracy bias reported in the present study was consistent with the results obtained in Experiment 3a. In that study although the proportion of accurate responses was unrelated to detail type, the total number of questions answered and the number of accurate questions answered were higher for central than peripheral details. Attentional focus theory as well as the SAM model which link performance to trace strength. It is surprising that memory was better for central than peripheral details when an immediate test was administered, while accuracy was equivalent for both types of detail when memory was measured after 24 hours (Experiment 1c). However, this difference may be due to the fact that participants in Experiment 1c were given a source monitoring task. Hence, they possibly engaged in more memory monitoring than the participants in the present study.

Confidence

The 'remember' instruction increased confidence in performance, more than the 'non-directive' instruction. In contrast, the 'remember' instruction had a selective effect on confidence in recall (Experiment 3a); it increased confidence in accurate, peripheral detail responses. When the relationship between the state of awareness and confidence was measured for adult recognition (Experiment 1c), confidence was high for peripheral details 'known', but a 'remember' retrieval state lowered confidence in peripheral detail responses. In general, participants in the present study displayed good memory monitoring skills. They were more confident when they provided accurate than inaccurate answers. Other experiments conclude that memory monitoring following an immediate recognition test is

efficient (Kebbell et al., 1996). The data from the present study dispelled claims that witnesses are overconfident in their performance (Smith et al., 1989; Sporer et al., 1995). There was also support for the second prediction that metamemory for central details is reliable. Specifically, central detail responses attracted higher confidence ratings than peripheral detail responses. This finding was consistent with evidence of a central detail accuracy bias reported in the preceding section.

The confidence-accuracy association

The most important result pertained to witnesses' ability to reliably match confidence and accuracy. The CA correlations in all the experimental conditions were significantly different from zero. So the results indicated that CA processing under certain conditions can be very reliable, and not as weak as reported (e.g., Perfect et al., 1993). Although it was expected that the 'remember' instruction would facilitate CA resolution more than the 'non-directive' instruction, the data failed to provide the necessary evidence. Instead, CA resolution was better for central detail memory. The results were identical to those obtained with adult recall (Experiment 3a). There is a growing evidence from Experiments 3a and 3c that central details are not only more accurately and confidently answered, but CA resolution depends more on the centrality of the details reported, than the nature of the pre-test, retrieval instruction administered. One limitation of the research, as with the other studies reported in the thesis, is that the CA was evaluated for individual *participants* rather than individual *questions*. This needs to be addressed in future studies.

Conclusion

The results of Experiment 3c supported one of the experimental predictions and the results of Experiment 3a. Taken together the results of the two studies provided evidence that recollective-based eyewitness memories are accurately and confidently recognised. More importantly, the data suggested that while a focussed retrieval instruction is effective, its advantage is limited to response accuracy and confidence, and not to the key issue under consideration, confidence-accuracy resolution. The next chapter provides an overview of Experiments 3a, 3b and 3c.

CHAPTER FOURTEEN

14.1 Overview of Experiment 3a, 3b and 3c

The data reported in this series of experiments applied the results obtained in Part One of the thesis. A 'remember' retrieval state facilitated eyewitness accuracy, confidence and CA resolution under some conditions. The present studies encouraged a 'remember' state of awareness *prior* to reporting events through the pre-test instruction administered to participants. The effectiveness of a 'remember' instruction to recall (Experiment 3a), recognition (Experiment 3c), and non-recollected, FOK experiences (Experiment 3b) are discussed in relation to the research objectives of the thesis, and the overall pattern of the data obtained the thesis so far. The success of the 'remember' pre-test instruction is shown in Figure 14.1.

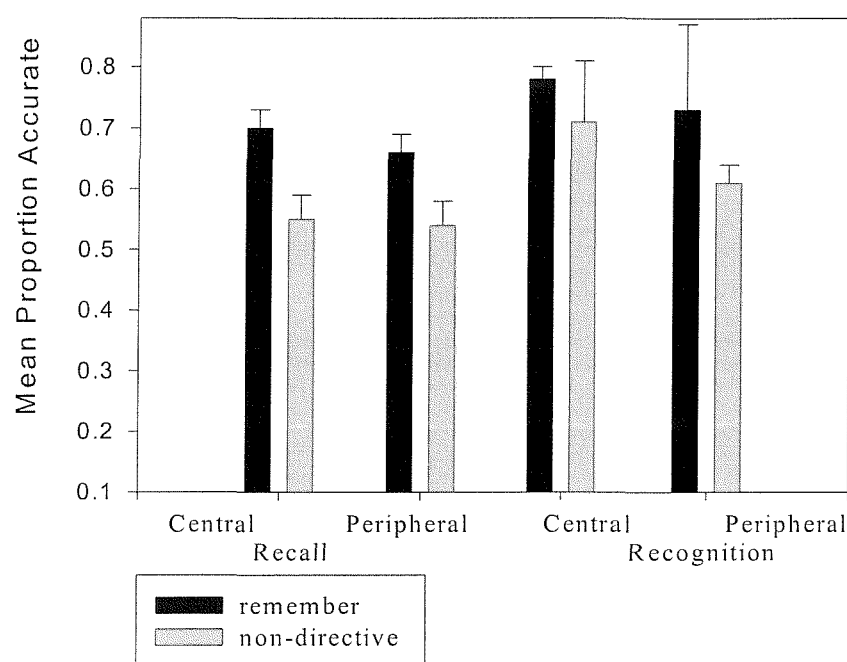


Figure 14.1: The effectiveness of a 'remember' pre-test instruction to adults' central and peripheral detail accuracy, with standard deviation bars.

14.2 Remembering, eyewitness memory and metamemory

Evidence from the recall (Experiment 3a) and recognition (Experiment 3c) studies revealed that the 'remember' instruction significantly improved response accuracy and confidence more than the 'non-directive' retrieval instruction (see Figure 14.1). Additionally, confidence-accuracy resolution was better for central detail responses. The implications of the data for the experimental predictions, and the evidence obtained in Part One of the thesis are considered separately for recall and recognition memory.

Recall

The benefit to recall accuracy of re-experiencing a specific event before reporting it was revealed in Experiment 1a, when the state of awareness accompanying retrieval was examined. The 'remember' pre-test instruction, which highlighted the same conscious awareness of events along with a request to answer a question only if the material can be recollected, significantly improved recall accuracy more than the non-directive instruction. This suggests that the 'remember' instruction imposed a stricter criterion for accuracy than the 'non-directive' instruction, in the same way that the 'remember' retrieval state represented more awareness of memory than the 'know' retrieval state in Part One of the thesis. Memory errors are reduced by encouraging focussed retrieval (Schacter et al., 1998) and mental context reinstatement (Tulving, 1985). The elements of imagery, context reinstatement and self-awareness are present in the Cognitive Interview (CI), which was developed to enhance the quality and reliability of eyewitness memory (Geiselman et al., 1984; Kohnken et al., 1995; Mello & Fisher, 1996).

An important result obtained in Experiment 3a, was the elimination of the central detail accuracy bias sometimes reported in the eyewitness literature (e.g., Migueles & Garcia-Bajos, 1999). This may, in part, be due to the recency of the memory test or the effectiveness of the 'remember' instruction administered in Experiment 3a. If the latter proposition was true, then one would expect a central detail accuracy bias when the 'non-directive' instruction was administered. However, the proportion of accurate central details (.55) was marginally higher than the proportion of accurate peripheral details (.54).

Johnson (1997) noted that remembering not only imposes a stringent measure of accuracy, but it boosts confidence in ability. Participants in Experiment 3a, like those in

Experiment 1a, were more confident when they remembered their answers. Specifically, in Experiment 3a, the 'remember' instruction increased confidence, more than the 'non-directive' instruction, in the reporting of accurate peripheral details. This is a relevant finding given that central detail memory was more accurate in Experiment 3a, and one would expect that confidence would also be higher when responding to central than peripheral detail questions. Consequently, a retrieval strategy that improves memory or confidence for peripheral details is a welcome one for the legal system, since these details may contain vital forensic evidence. Witnesses demonstrated good insight into their memories, as they were more confident when they were accurate than inaccurate.

Unfortunately, the benefits to accuracy and confidence did not extend to confidence-accuracy judgements. Although the experimental prediction was unsupported, the CA correlations were high and significantly different from the mean in all the experimental conditions. The CA correlations were of similar magnitude to those reported in the eyewitness literature (Robinson & Johnson, 1996; Robinson et al., 1997).

Recognition

The benefits of the 'remember' instruction to response accuracy obtained for recall, extended to recognition memory (Experiment 3c). This result was relevant because a 'remember' state of awareness during recognition was unrelated to accuracy when memory was evaluated after a 24 hour delay (Experiment 1c). In Experiment 3c, participants expressed more confidence in their answers when they were given the 'remember' instruction than the 'non-directive' one. This result could be attributed to Johnson's (1997) view that remembering imposes a stringent test of memory that boosts confidence in performance.

Recognition accuracy and confidence were sensitive to the centrality of the details recognised. Specifically, central details were reported more accurately and confidently than peripheral details. Overall, accurate reports were expressed with greater confidence than inaccurate reports. The confidence-accuracy correlations were strong and significantly above zero across the experimental conditions.

14.3 Remembering and feeling-of-knowing (FOK) predictive accuracy

There were insufficient cases in the experiments conducted in Part One of the thesis to reliably assess the effects of retrieval states to predictive accuracy, confidence and the FOK-CA association. The data from Experiment 1b revealed that central and peripheral details generated an equivalent proportion of FOK judgements, in relation to 'don't know' judgements. Predictive accuracy was accompanied by a sense of familiarity. This is discussed by Lories et al. (1998). In terms of the FOK-CA association, the only significant correlation was for peripheral details 'known'. Given the paucity of data on eyewitness FOK accuracy, and evidence that eyewitness FOK accuracy is unreliable (e.g., Perfect & Hollins, 1999), the data from these experiments contribute to our understanding of eyewitness prospective, FOK memory. The limitations that resulted from the use of the remember/know procedure in Part One of the thesis, made it necessary to replicate Experiment 1b, with a larger sample. Evidence from Experiment 3b indicated that neither the pre-test instruction, nor the centrality of the detail that was unanswered, contributed to FOK experiences, predictive accuracy, confidence or the FOK-CA association. Although there are limitations in comparing the results of Experiment 1b with Experiment 2b, because of the difference in the research design and number of questions asked of participants, some of the finding patterned those obtained in Experiment 1b.

Overall, the data from Experiments 1b and 3b were inconsistent with Koriatic's (1993, 1995, 1998) accessibility hypothesis that trace strength contributes to FOK experiences. A relevant finding was that predictive accuracy, though unrelated to instruction and detail, was above chance performance. This implies that some aspects of the eyewitness FOK experiences are reliable. Unfortunately, there was no clear evidence that the state of awareness prior to retrieval, when manipulated as instruction type, contributed to FOK accuracy in the same way as it was associated with a 'know' state of awareness accompanying retrieval (Experiment 1b). Further research is needed in order to assess the cognitive factors that trigger feelings of knowing, and more importantly, if the factors that prompt FOK's also determine FOK accuracy.

14.4 Conclusion

The goal of this series of experiments was to assess if a 'remember' state of awareness can

be successfully created through a pre-test instruction, and be used to improve response accuracy, confidence and the strength of the CA association. The key finding was that remembering facilitated recall and recognition accuracy. As expected confidence improved for remember-based recollections, but an important finding was that the 'remember' instruction boosted confidence, more than the non-directive instruction, when accurate peripheral details were reported (Experiment 3a). Given the weight jurors place on the reporting of peripheral or background details as a sign of the reliability of memory for central details (Bell & Loftus, 1988, 1989; Heath et al., 1997; Wells, Ferguson & Lindsay, 1981), this result has added forensic relevance.

The next series of experiments investigated the utility of the 'remember' instruction in improving the eyewitnessed memories of 8-11 year olds. There were two reasons for extending the studies with children. The first reason was based on the encouraging results obtained in Part One of the thesis. Children's recall was more accurate during a 'remember' retrieval state than a 'know' retrieval state (Experiment 2a). Although their recognition accuracy was unrelated to their ability to 're-vive' their experiences, CA resolution for central details was better during a 'remember' retrieval state. The second reason for investigating the effectiveness of a 'remember' instruction to children's accuracy, confidence and CA judgements, was based on the benefits derived with the 'remember' instruction to adult performance. These benefits were expected to extend to children. When children are told to 'report only what they can remember seeing or hearing' this has the potential for improving the accuracy of their statements in several ways. First, it may reduce their tendency to guess an answer rather than demonstrate a lack of knowledge. Second, it encourages them to actively re-experience the incident they are seeking to describe. Third, children seem to benefit more from deliberate, retrieval strategies than adults, because children do not spontaneously use such deliberate retrieval strategies or cues (Ackerman, 1997). The provision of a focussed, 'remember' instruction was expected to facilitate children's memory for the specific details of an eye-witnessed event.

CHAPTER FIFTEEN

Experiment 4a: The Relationship between State of Awareness Instructions and Confidence-Accuracy Judgements to Children's Immediate Recall

"The controlling party in an interview of a child is the adult interviewer, whose use of language and questioning techniques directly affects the quality and quantity of children's responses." (Walker & Hunt, 1998)

15.1 Introduction

Although some observations may be deliberately encoded, most child witness memory is acquired incidentally. When children are not forewarned about an event, as in the present study, memories are likely to be based more on incidental memory, than deliberate learning. Walker and Hunt (1998) believe that the skill of an interviewer and the questioning format determine whether a child reports a true memory, a false belief or no information at all. This study replicated Experiment 3a, and it was conducted with children 8-11 years. The study assessed the effectiveness of administering a 'remember' versus a 'non-directive' pre-test instruction to recall accuracy, confidence, and the magnitude of the CA association.

The data from Part One of the thesis shaped the predictions of the present study. Children's recall accuracy was higher for their remember-based recollections, than knowledge known (Experiment 2a). This implies that simply altering the way a question is phrased has the potential for significantly improving the accuracy of an account. Moreover, children's ability to match confidence and accuracy improved during a 'remember' retrieval state, although this was restricted to their recognition of accurate central details (Experiment 2c). These results offered some support for prior evidence that the effectiveness of contextual cues are modified by the task demand and the timing of the test (Gobbo, 2000). The manipulation of a witness's state of awareness through a pre-test instruction, was successful in improving adult recall (Experiment 3a) and recognition (Experiment 3c) accuracy, as well as confidence. These advantages should also extend to children. An immediate memory test inoculates against forgetting (Brainerd & Reyna, 1996; Warren & Lane, 1995), so performance should be better than when memory was evaluated after 24 hours.

Remembering an event is accompanied by a degree of recollective experience, including some form of visual or auditory memory trace, that gives authenticity to that recollection (Parkin, 1998). The data from Part One and Two of the thesis provided evidence of this advantage to three important aspects of eyewitness memory, accuracy, confidence and the CA association. Investigating and identifying the strengths and limitations of children's abilities to accurately report their experiences is important, because of the range of applications for the findings. If children's eyewitness memories improve with the use of a 'remember' pre-test instruction, then this knowledge can be used to enhance children's recall in medical interviews and the classroom. Memory for medical interviews (Principe, Ornstein, Baker-Ward & Gordon, 2000; Quas et al., 1999) and experiences of sexual abuse (Bidrose & Goodman, 2000) reveal varying degrees of accuracy in the reporting of events. When children's accounts of their sexual abuse were corroborated with audio-taped and photographic evidence, victims aged 8-14 years were highly accurate in describing their experiences. This increases the value of children's testimony in a criminal investigation.

Research should provide more than a descriptive account of children's memory, meta-memory skills and their weaknesses. Consequently, the present study examines the role of instruction type in facilitating children's accuracy. Walker and Hunt (1998) believed that the onus was on the interviewer to improve the quality of children's reports. Empirical research confirms that the type of questions asked determines children's willingness to accept the occurrence of a fictitious event (Quas et al., 1999), or to give an accurate account of events. Therefore, the competence of young witnesses is not solely a function of their abilities, but a reflection of the competence of the adults who interview them (Cashmore & Bussey, 1996; Saywitz, 1995). The way a question is phrased shapes the response obtained, because the form of the retrieval question can influence memory or suggestibility (Cassel & Bjorklund, 1995). Thus, requesting children to report only what they can 'remember seeing or hearing' of the incident in question, encourages memory and source monitoring. The evidence derived from Experiment 2a revealed that children's source accuracy was a strong predictor of their content accuracy.

Although children's memorial skills can be accurate (e.g. Bidrose & Goodman, 2000), the reporting of the minutia, or peripheral details, associated with an incident may

require special retrieval assistance. This is because children may either be limited in their ability to make exhaustive memory searches (Ochsner et al., 1999), or they have difficulty in retrieving specific, stored information (Lindsay et al., 1995). The emphasis on increasing accessibility to the stored material and facilitating retrieval through mental context reinstatement is embedded in the Cognitive Interview (CI) which has proven to be successful with children (McCauley & Fisher, 1995; Memon et al., 1996; Miller, Fremouw, Aljazeera & Parker, 1996). McCauley and Fisher (1995) reported that the CI elicited 64 percent more correct information than the Standard Interview (SI) at the first interview and 46 percent more information during a second re-interview with second graders. Memon et al. (1996) showed 8 and 9 year olds a video-taped event and reported that the CI reduced children's acceptance of misleading information. Miller et al. (1996) found that children were more accurate when they were re-interviewed with the CI.

There are psychological and forensic reasons for assessing children's competence in reporting the central and peripheral details of an event (Warren & Lane, 1995). These were discussed in Chapter One. Some performance studies indicate that children are more reliable when reporting central details (Cassel & Bjorklund, 1995; Gobbo, 2000; Poole & White, 1991). Gobbo (2000) found that 7-8 year olds were more accurate in recalling central than peripheral details; however, this result was based on the use of 1 central and 1 peripheral detail. More central and peripheral detail questions are required before the results can be accepted. There was an interesting finding that warrants further exploration. Gobbo reported an interaction between detail and cues to recall accuracy. Specifically, there was a greater difference between central and peripheral detail recall in the absence of cues.

Other studies reveal that children are accurate in reporting the central and peripheral details of a crime-related event (eg., Warren & Lane, 1995). However, the data from Experiment 2a revealed that when children were consciously aware of how their knowledge was derived, this central detail accuracy bias was eliminated (Experiment 2a). Moreover, CA resolution was unaffected by detail type. Children recognised central and peripheral details equally accurately and confidently. More importantly, the effectiveness of a 'remember' retrieval state in increasing the strength of the CA association was moderated by the centrality of the detail recognised.

Given these findings one may expect that a 'remember' instruction would eliminate the central detail accuracy bias, in the same way as the 'remember' retrieval state of awareness led to an equivalent recall of central and peripheral details (Experiment 2a). Children in the present study were asked questions relating to the colour of the clothes worn by the individuals shown in the video-taped event, as well as the location of places. Similar research revealed that nine year olds are accurate in reporting the location and colour of objects 30 minutes after they had seen them (Ling & Blades, 1996).

In general, the empirical evidence in Parts One and Two of the thesis along with the findings reported in the literature, revealed the benefits to accuracy of emphasising 'personal and recollective' experiences. Specifically, the 'remember' instruction was expected to improve recall accuracy, confidence and the confidence-accuracy correlation more than the non-directive instruction. Given the results of Experiments 3a and 3c, better central detail memory was anticipated on all three measures of performance.

15.2 Method

Design

The experimental design was identical to the one used in Experiment 3a.

Participants

Two hundred and eight children (104 girls, 104 boys) ranging in age from 8 - 11 years ($M = 9$ years, 6 months) participated in the study. Participants were recruited from Kanes Hill Primary School and Sholing Junior School in Southampton. They were randomly assigned on the basis of class groups to either a 'remember' ($n = 118$) or a 'non-directive' instruction ($n=90$) condition. Gender of the participants was matched as far as possible across the two instruction conditions.

Materials

The materials were identical to that used in Experiment 3a.

Instructions

The wording of the instructions and the questionnaire was simplified for use with children

(e.g, 'How confident do you feel that your answer is correct' was changed to 'How sure are you that your answer is correct'? Important phrases were repeated to ensure clarification.

The 'remember' instruction stated.

"I want you to tell me what you can about the video you have just watched. I want to make sure that what you tell me is as accurate or correct as it can be. Only tell me what you saw in the video, don't make anything up. If you think that you know the answer to the question but do not REMEMBER SEEING and HEARING it in the film, DO NOT answer the question and DO NOT GUESS. Write on the page 'I DO NOT KNOW THE ANSWER'. If you cannot answer the question, I want you to tell me if this was because (a) you did not know the answer or (b) you feel you would know the answer if I gave you some clues."

The non-directive instruction stated.

"I want you to tell me what you can about the video you have just watched. I want to make sure that what you tell me is as accurate or as correct as it can be. I want you to tell me what you saw in the video, don't make anything up. Answer the questions as truthfully as you can. If you do not know the answer, do not guess it. Write on the paper 'I DO NOT KNOW THE ANSWER'. If you cannot answer the question, I want you to tell me if this was because (a) you did not know the answer or (b) you feel you would know the answer if I gave you some clues."

The instructions were administered to children verbally and written on the questionnaire. The questions on the recall test were read to the children and were also written on the questionnaire. During completion of the test, care was taken to ensure clarification on an individual basis. Feedback from a sample of 10 boys and 10 girls who were given the non-directive instruction, and 7 boys and 8 girls who were administered the 'remember' instruction, revealed that each set of participants understood their own instructions and followed them carefully. It was expected that the inclusion of a 'don't know' option would minimise children's need to provide an answer, if they did not have one. The children's self reports indicated that the instructions prevented them from guessing.

Procedure

Participants watched the event in groups of 20 students after which they completed a surprise memory test in the form of a self-administered questionnaire. The experimenter read the instructions to the class and participants then completed the cued-recall memory test. For each answered question, they rated their confidence in their recall accuracy on a 5-point Likert scale (where 1 = not very sure and 5 = very sure). A practice question was included at the beginning of the questionnaire to ensure clarity of the task and the instructions. The children were frequently reminded to indicate if they did not understand the task. Participants were cautioned not to discuss the questions with one another and their performance was monitored by the researcher and two teachers. The task lasted 40 minutes.

15.3 Results

Eyewitness Recall

The data analysis was identical to that outlined in Experiment 3a. For each item on the cued-recall test responses were categorized as either accurate, inaccurate, or don't know. The responses to the questions were scored in a 'blind' fashion; that is, regardless of the type of detail reported. This was done to prevent any bias in the data analysis. Table 15.3.1 displays participants' performance and confidence ratings, across central and peripheral details, for the 'remember' and 'non-directive' instructions.

Total number of questions answered. The focus on analysing accuracy risks missing differences in the overall level of eyewitness responses. The total number of questions participants answered provides an indication of the total amount of information pertaining to a witnessed event that can be immediately recalled. Thirty questions were asked, and the mean number of questions answered and (standard deviation) were 21.84 and (5.40).

Children recalled 73 percent of what they saw. A two-way, repeated measures Analysis of Variance (ANOVA) assessed the effects of instructions and detail to the total number of questions answered. Instruction had no significant effect on the quantity of information reported ($F(1, 206) = 1.38, MSE = 20.08, p > .05$). The number of questions answered, out of 30, when participants were given the 'remember' and 'non-directive' instructions was 22.34 and 21.46 respectively. Therefore, it seems unlikely that (1) the 'remember' instruction made participants more conservative in responding to questions,

directive instruction, and (2) that the ‘non-directive’ instruction elicited information that was also ‘remembered’. Central than peripheral details were recalled ($F(1, 206) = 262.60$, $MSE = 608.15$, $p < .001$). The interaction the two variables was also significant ($F(1, 206) = 7.31$, $MSE = 16.92$, $p < .025$). The means (and standard deviations) for each experimental condition are summarised in the first row of the data presented in Table 15.3.1. The interaction between instruction and detail is plotted in Figure 15.3.2. Although there was no effect of instruction on the number of central detail questions answered, the remember retrieval instruction led to a greater increase in the number of peripheral detail questions answered than the non-directive instruction.

Table 15.3.1. *Mean number of questions answered, correct responses, incorrect responses, don't know responses and proportion accuracy across instruction and detail for child witnesses, together with confidence ratings when accurate and inaccurate (and standard deviations).*

	Central Details		Peripheral Details	
	Non-directive	Remember	Non-directive	Remember
No. of questions answered	12.15 (2.69)	12.19 (2.95)	9.31 (2.83)	10.16 (3.19)
No. of correct responses	10.23 (.14)	8.96 (.11)	9.27 (.09)	9.39 (.09)
No. of incorrect responses	4.89 (.11)	4.56 (.10)	4.35 (.11)	4.41 (.26)
No. ‘don’t know’ responses	.27 (.46)	1.35 (.79)	.82 (.22)	.83(.34)
Proportion Accurate	.60 (.01)	.64 (.02)	.54 (.02)	.58 (.02)
Confidence when accurate	4.24 (.06)	4.33 (.06)	4.03 (.08)	3.89 (.09)
Confidence when inaccurate	3.34 (.09)	3.72 (.11)	3.46 (.09)	3.40 (.11)

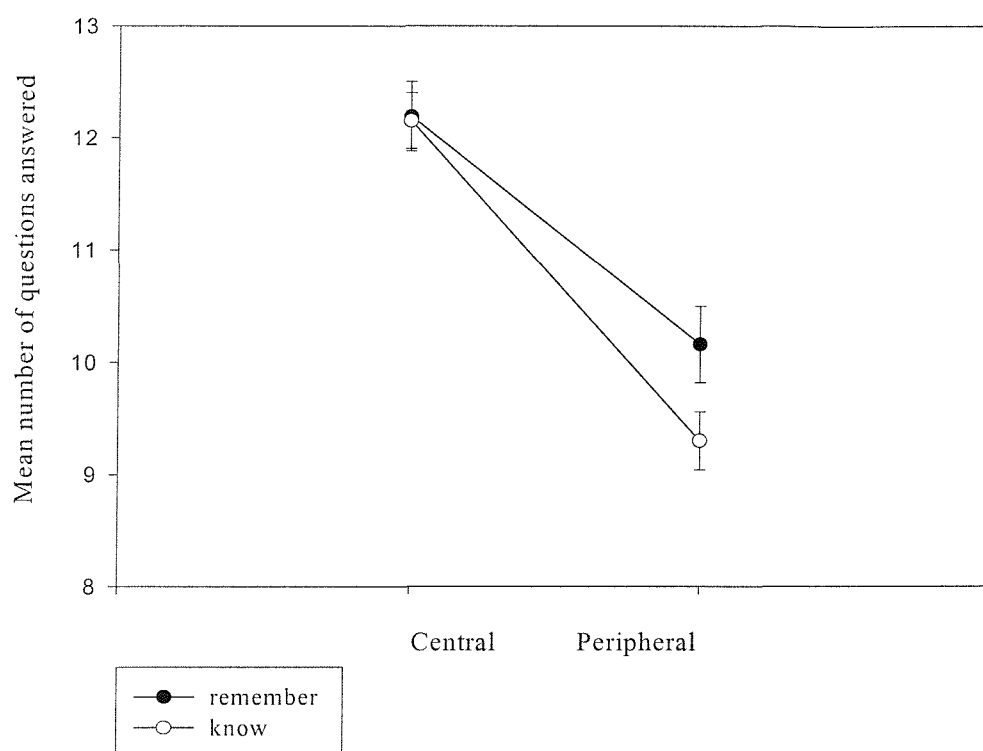


Figure 15.3.2: Interaction between instruction and detail on the mean number of questions answered, with standard error bars.

Number of correct responses. The mean number of questions participants correctly answered was 12.72, or 42 percent, of the 30 questions asked. A two-way, repeated measures (ANOVA) of the mean total correct responses by instruction and detail revealed that the 'remember seeing' instruction significantly improved the number of correct responses than the non-directive instruction ($F(1, 206) = 4.85$, $MSE = 34.20$, $p < .05$). There were more accurate central than peripheral details ($F(1, 206) = 185.39$, $MSE = 449.04$, $p < .001$). The interaction between instruction and detail was non-significant ($F(1, 206) = 1.83$, $MSE = 4.42$, $p > .05$). The mean numbers of correct responses across instruction and detail were summarised in the second row of Table 15.3.1.

The mean numbers of incorrect responses for all participants were listed in the third row of the data in Table 15.3.1. An ANOVA analysis to evaluate the effects of instruction and detail on the mean number of incorrect responses revealed no effect of instruction to incorrect responses ($F(1, 206) < 1$, $MSE = 1.87$, $p > .05$). There was a higher number of

incorrect central than peripheral detail answers ($F(1, 206) = 4.96, MSE = 12.04, p < .01$). The interaction between the two variables was non-significant ($F(1, 206) = 1.67, MSE = 4.04, p > .05$).

An overview of the data in Table 15.3.1 suggested first, that the ‘remember’ instruction improved the proportion of accurate responses, more than the ‘non-directive’ instruction; second, central details were more accurately reported than peripheral details. Separate ANOVA analyses were conducted to examine the effects of instruction and detail on recall accuracy, confidence ratings, and the confidence-accuracy association.

Proportion of Accurate Responses

The proportion of accurate responses ranged from .54 to .64 ($M = .59$) and this was similar to the mean of (.60) obtained in Experiment 2a, following a 24 hour retention interval. However, the comparison is cautiously made given the differences in the number of questions participants were asked as well as the delay in the memory test, between the two studies. Analysis of the proportion of accurate responses by means of a two-way, repeated measures ANOVA confirmed the experimental prediction that a ‘remember’ pre-test instruction increased recall accuracy more than a non-directive one ($F(1, 205) = 4.06, MSE = 1575.8, p < .05$). The data were consistent with the results of Experiment 2a in which remember-based recollections were more accurate than familiarity-based or ‘know’ reports. The second experimental prediction was also supported because central detail memory was more accurate than memory for peripheral details ($F(1, 205) = 18.22, MSE = 3213.6, p < .001$). In contrast, the central detail accuracy bias was eliminated in Experiment 2a. The result obtained in Experiment 2a was attributed to the benefits to accuracy during a ‘remember’ retrieval state. In contrast, a ‘know’ retrieval state resulted in better memory for central than peripheral details (Experiment 2a). The interaction between instruction and detail in the present study was non-significant ($F(1, 205) < 1, MSE = 7.53, p > .05$).

Confidence in Responses

A three-way, repeated measures ANOVA examined the effects of instruction, detail and accuracy on confidence ratings. There was no main effect of instruction on confidence ($F(1, 192) < 1, MSE = .02, p > .05$). The second hypothesis was supported as children were

confident in their central detail answers ($F(1, 192) = 10.20$, $MSE = 2.74$, $p < .001$), and their accurate responses ($F(1, 192) = 264.14$, $MSE = 99.99$, $p < .001$). There was a significant interaction between instruction and detail ($F(1, 192) = 5.00$, $MSE = 1.34$, $p < .05$). Further analysis of the simple main effects revealed that the 'remember' instruction boosted confidence in the reporting of central than peripheral details ($t(88) = 3.89$, $p < .001$), more than the non-directive instruction ($t(117) = .44$, $p > .05$). This is displayed in Figure 15.3.3. There was partial support for the experimental prediction and the results differed from those reported in Experiment 2a in which children's confidence was unrelated to either a remember retrieval state or the centrality of the detail reported. The interaction between instruction and accuracy was non-significant ($F(1, 192) < 1$, $MSE = .02$, $p > .05$)

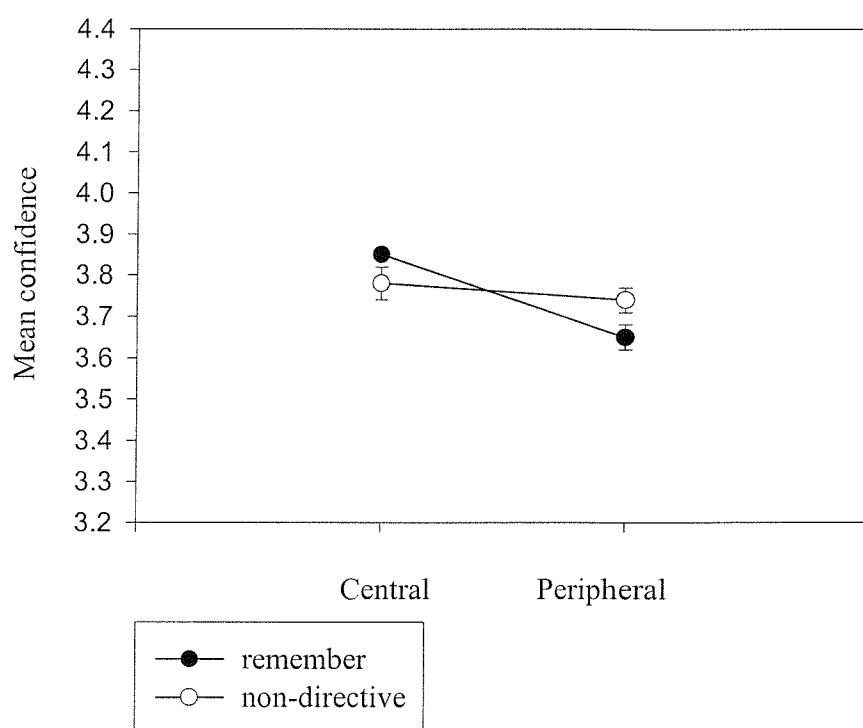


Figure 15.3.3. Interaction between detail type and instruction on confidence, with standard error bars.

A significant interaction between accuracy and detail was observed ($F(1,192) = 31.82$, $MSE = 8.13$, $p < .001$). Subsequent analysis of the simple main effects indicated that the difference between confidence in accurate and inaccurate answers was greater for central ($t(201) = 16.93$, $p < .001$) than peripheral detail ($t(197) = 9.20$, $p < .001$) responses. This is shown in Figure 15.3.4. No significant three-way interaction emerged between instruction, accuracy and detail to qualify the previous two-way interaction ($F(1,192) < 1$, $MSE = .16$, $p > .05$).

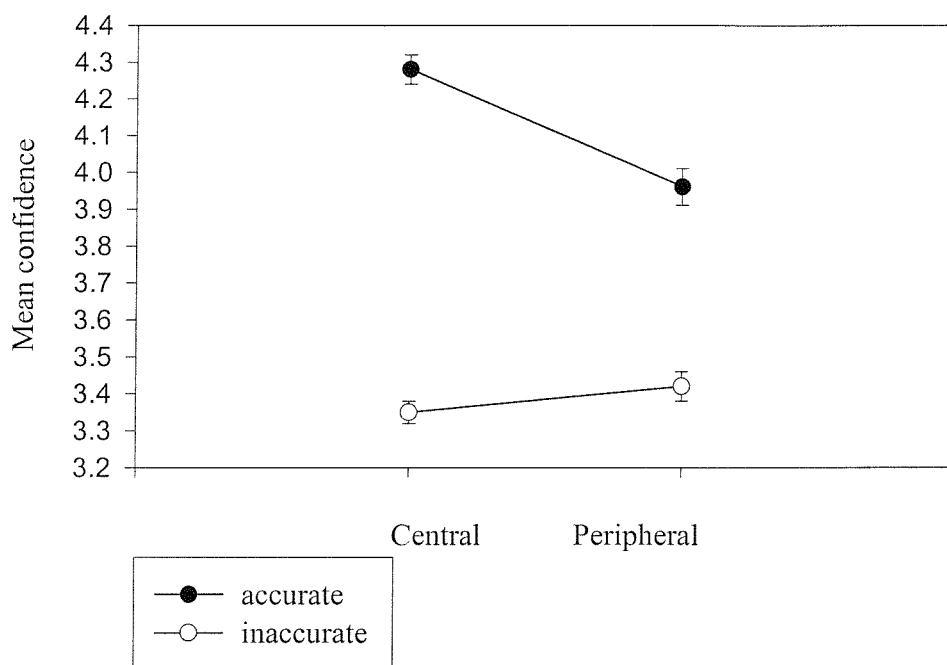


Figure 15.3.4. Interaction between accuracy and detail on confidence, with standard error bars.

The Confidence-Accuracy Association

The confidence-accuracy association was examined using the analysis described in Experiment 1a. Table 15.3.5 summarizes the CA correlations, across instruction and detail.

The CA correlations ranged from .43 to .60 across the experimental conditions ($M = .51$). The mean CA correlation was higher than the mean of (.23) obtained in Experiment 2a, after a 24 hour retention interval. Although it appears that CA resolution is more reliable following an immediate test of memory, differences in the research designs in the two studies could account for the result. Table 15.3.5 shows high CA correlations in all experimental conditions. There was no clear effect of instruction on the CA association, although the correlations were higher for central than peripheral details.

Table 15.3.5: *Mean confidence-accuracy gamma correlation (and standard deviation) across instruction and detail.*

	Central Details	Peripheral Details
Non-directive Instruction	.60 (.09)	.43 (.12)
'Remember' Instruction	.59 (.11)	.43 (.10)

(All gamma correlations were significantly greater than zero at $p < .001$.)

A two-way, repeated measures ANOVA analysed the effects of instruction and detail to the strength of the CA correlation. The data failed to confirm the experimental prediction, because instruction was unrelated to the strength of the CA association ($F(1, 182) < 1$, $MSE = .01$, $p > .05$). The second prediction was upheld, as the CA correlation was higher for central than peripheral details ($F(1, 182) = 13.44$, $MSE = 2.89$, $p < .001$). There was no significant interaction between the two variables ($F(1, 182) < 1$, $MSE = .03$, $p > .05$). There was some consistency in the data obtained in this study and the ones reported in Experiment 2a. In Experiment 2a, a 'remember' state of awareness at retrieval was associated with an increase in the magnitude of the CA correlation more than a 'know' retrieval state; however, this effect was limited to the reporting of central details.

15.4 Discussion

This experiment applied the results obtained in Experiment 2a, in which a 'remember' retrieval state was associated with improvements in recall accuracy and CA resolution, as a

pre-test instruction to create a 'remember' state of awareness prior to reporting an eyewitnessed event. The second rationale for the study was to extend the study conducted with adults (Experiment 3a), to children and to assess the generalizability of the results obtained in Experiment 3a, with a different age group. The data from the present study provided additional evidence that a 'remember' pre-test instruction increases response accuracy, more than a 'non-directive' instruction. The implications of the results are discussed in relation to (1) the theories outlined Chapter One, (2) the pattern of results obtained in the thesis from prior experiments, and (3) the overall objective of the thesis.

The effectiveness of the 'remember' instruction to the CA association

Recall accuracy

Overall performance is first evaluated before recall accuracy. The nature of the pre-test instruction had no significant effect on the quantity of information children recalled. However, there were more central than peripheral detail answers. Given that the remember instruction did not make participants more conservative in responding to questions, it is relevant that the number of correct answers and the proportion of accurate responses increased with the remember instruction. The data fit the views expounded by memory theorists regarding the benefits of mental reinstatement to accuracy.

Recall is regarded as a specialised form of memory that brings something not perceptually present, to conscious awareness. The process of recall is accompanied by a reconstruction of events (Mandler, 1990) and it is during the process of reconstruction that errors can occur which may weaken the CA correlation (Leippe, 1980). Therefore, it is important to construct a question in such a way that it encourages a witness to access and report information that this person is certain is accurate. The data from the present study confirmed that a 'remember' retrieval state (Experiment 2a), when manipulated as the 'remember' pre-test instruction (Experiment 4a), significantly improve children's recall accuracy, more than the 'non-directive' instruction. The proportion of accurate responses was ($M = .59$) across the experimental conditions, which was similar to the mean of (.60) obtained with a 24 hour retention interval (Experiment 2a). Although the nature of the two tests was not identical, the analysis of the video only material in Part One of the thesis, and the calculation of the proportion of accurate responses made trends in the results

comparable. It was surprising that there was no improvement in performance when an immediate memory test was administered, because immediate testing improves performance (Brainerd & Reyna, 1996; Warren & Lane, 1995). It is possible that children reported as much as they were able to of the observed event. Consequently, neither a 'remember' state of awareness, nor a 'remember' pre-test instruction, increased accuracy beyond 60 percent of the information provided.

The key finding, that related to the main goal of the thesis, was the improvement in the proportion of recall accuracy with the 'remember' instruction. The data suggested that the use of questioning techniques can substantially affect the quality of children's reports (Walker & Hunt, 1998). Children appeared to benefit from explicit retrieval guidance, as was suggested in the literature (Bjorklund, 1988; Flavell, 1977; Norman & Schacter, 1996). This knowledge can assist legal officers in their pre-interview preparations with children. However, the 'remember' instruction failed to eliminate the central detail accuracy bias reported in the literature (Cassel & Bjorklund, 1995; Gobbo, 2000; Poole & White, 1991), in the same way as the 'remember' retrieval state eliminated this bias in (Experiment 2a). In Experiment 2a, children accurately reported central and peripheral details equally well when they 'remembered' the information during retrieval. However, the central detail accuracy bias occurred during the 'know' retrieval state. In terms of the effect of detail type on performance, the data from the present study were more in line with attentional focus and the SAM model, which link performance to the strength of a memory trace.

Confidence

The effectiveness of a 'remember' instruction in increasing confidence in children's reports was moderated by detail type. Specifically, the 'remember' instruction increased confidence in responses more than the non-directive instruction, but only for central detail responses. This was in line with evidence from the present study in which children expressed more confidence in their central detail answers, than their peripheral detail ones. In general, participants displayed good meta-memory skills, because they were more confident when accurate than inaccurate. Specifically, the difference between confidence in reporting accurate and inaccurate central details was higher, than the difference between accurate and inaccurate peripheral details. In contrast, neither the state of awareness accompanying

retrieval nor the type of detail reported influenced children confidence (Experiment 2a).

The Confidence-Accuracy association

The 'remember' instruction was expected to improve CA resolution because it facilitated children's recall accuracy (Experiment 2a), and improved central detail CA resolution with adults (Experiment 1a). Contrary to these expectations, the strength of the CA correlations in the present study responded to the centrality of the event reported, rather than the type of pre-test instruction administered. This was consistent with the results of Experiment 3a and 3c. It is important to note that the CA correlations were significantly greater than zero in all the experimental conditions, so children have the potential for matching confidence and accuracy on an eyewitness task.

Conclusion

The main purpose of the study was to examine how a 'remember' pre-test instruction facilitates recall accuracy, confidence and the confidence-accuracy association. The data were consistent with the results obtained from adult participants (Experiment 3a). More importantly, the results show that the advantage to recall accuracy and confidence demonstrated during a 'remember' state of awareness at retrieval, can be successfully applied through a pre-questioning instruction. The data contributed to the literature by illustrating first, how the ability to be consciously aware of events before reporting them improves both overall performance and accuracy. Second, the ability to reconstruct an event is somewhat constrained by the nature of the detail reported. The ability to reconstruct a visual/auditory image of an event sufficiently to answer a question correctly is limited to the centrality of the detail being retrieved. This was also reflected in confidence judgements and the strength of the confidence-accuracy association. Leippe (1980) claimed that a variable that influences accuracy may have no effect on confidence, leading to a weak CA association. In light of the data reported in this study, the 'remember' instruction improved recall accuracy, but its effect on confidence was moderated by the centrality of the detail reported. Central details were both accurately and confidently reported, so it was unsurprising that participants were able to match confidence and accuracy efficiently. The

next experiment examines if instruction and detail are related to another type of memory monitoring, feeling of knowing (FOK) judgements. The contribution of these two variables to FOK predictive accuracy, confidence, and the FOK-CA association are investigated. The study was a replication of Experiment 3b, with children, but it also served to assess the robustness of the finding reported in Experiment 2b.

CHAPTER SIXTEEN

Experiment 4b: The Relationship between State of Awareness Instructions and the Confidence-Accuracy Association for Children's Feelings of Knowing Judgements

"The FOK heuristic is predicated on the assumption that one is more likely to know the answer to a question if that question brings a large number of partial clues to mind than if it brings to mind a few clues." (Koriat, 1998).

16.1 Introduction

Children gave more feeling of knowing (FOK) judgements, in relation to 'don't know' responses, to unanswered central than peripheral detail questions. This occurred when memory was evaluated after 24 hours (Experiment 2b). The accessibility hypothesis (Koriat, 1993, 1995) claims that FOK experiences may be made on the basis of, among other factors, the strength of the memory trace. The data from Experiment 2b were consistent with Koriat's claims. Children's predictive accuracy was higher than chance performance, so this justifies further investigation of how children monitor knowledge for which they give a FOK judgement. The role of a 'remember' pre-test retrieval instruction is considered to be potentially beneficial to memory monitoring, given its success in improving children's performance in Experiment 4a. In that study, when children were able to recall information, central details were reported more accurately and confidently, than peripheral details (Experiment 4a). More importantly, CA resolution was better for central details.

In light of evidence that central detail memory is reliable, there is more scope for improving children's memory for the peripheral details of the eyewitnessed event they were unable to spontaneously recall. It was expected that this could be achieved in two ways; first, through the use of a 'remember' pre-test instruction before attempting the recognition test; and second, the cues provided by the alternative answers on the recognition test may provide a context for memory. The first point accords with Koriat's (1998) position above. It offers the possibility that the effectiveness of the 'remember' instruction in enhancing recall accuracy (Experiment 4a) may have the same benefit in directing or continuing the search for some partial or related knowledge underlying a FOK. Both the pre-test

instruction and the nature of a recognition test provide retrieval assistance by encouraging participants to focus on the context in which the target information is located.

Children's predictive accuracy was above chance (Experiment 2b) so they were also expected to be reliable in the present study. The FOK methodology may alter performance not only on the basis of the experimental conditions, but because of retrieval practice and retrieval induced forgetting (e.g. Anderson, 1995; Fritz et al., 2000). Despite this limitation, there is a practical advantage in giving children a second opportunity to retrieve information, they could not spontaneously recall, by providing contextual cues via a recognition test. It is also forensically relevant that people are given another opportunity to retrieve information they cannot initially remember (Huffman, Crossman & Ceci, 1997).

This experiment improved on the limitations imposed by the use of the remember/know procedure in Experiment 2b. Another impetus for the research was based on the fact that a few of the research issues outlined in Experiment 2b were not examined. This was due to an insufficient number of cases in some of the experimental conditions. The results obtained in Experiment 2b needed to be replicated before being accepted. To recap, Experiment 2b examined the effect of detail to FOK judgements, and the influence of the state of awareness accompanying retrieval as well as detail type to FOK predictive accuracy, confidence and the FOK-CA association. The results revealed that children's predictive accuracy for peripheral details was accompanied by a 'know' than a 'remember' state of awareness at retrieval. Similarly, a 'know' state of awareness accompanied adult predictive accuracy, but this was restricted to central details recognised. The common finding was that FOK predictive accuracy was associated with a 'know' retrieval state. Lories et al. (1998) claim that FOK experiences are based on a sense of familiarity, so the data from Experiments 1b and 2b, were in line with this view.

The novelty of the present study was to investigate how a 'remember' pre-test instruction could encourage the search for information that was not initially recalled, but could nevertheless subsequently be recognised. This study replicated Experiment 3b and it was conducted with children aged 8-11 years. With the exception of Experiment 2b, research, to date, focussed on children's predictive accuracy in an educational context, but not a forensic one. The predictions regarding children's performance were based on the results of the preceding experiments reported in the thesis, as well as empirical evidence on

children's memory monitoring for their judgements of learning. The literature suggests that from the age of 8 years, children are accurate when they experience a feeling of knowing (Efklides et al., 1999; Pressley et al., 1987b; Pressley & Ghatala, 1989; Schneider, 1985). However, the characteristics of the studied item, such as the degree of difficulty of the task (Efklides et al., 1999), or how much people think they know about a domain of knowledge (Reder & Ritter, 1992), influence judgements of future performance. Given the lack of research into children's FOK for eyewitness memory, this study contributes to the literature by investigating how the state of awareness prior to responding to a question, relates to FOK experience judgements and the accuracy of these predictions. It was expected that more FOK judgements, and better predictive accuracy, confidence and the FOK-CA association, would respond to a 'remember' than a 'non-directive' instruction.

16.2 Method

Design

This study was part of Experiment 4a.

Participants

The participants were the same as those in Experiment 4a, and they retained the same instruction condition to which they were assigned in that study. One hundred and eighteen participants were given the 'remember' instruction and 89 received the 'non-directive' instruction.

Materials

The materials were identical to that used in Experiment 4a and the recognition questionnaire was identical to the one used with adults in Experiment 3b.

Instructions

The instructions were identical to the ones used in Experiment 4a but the participants were not required to make a feeling of knowing judgement as in Experiment 4a. The instructions were written on the test questionnaire and verbally administered to the children to ensure clarity.

Procedure

The procedure was identical to the one used in Experiment 3b, but the participants were assigned to an instruction condition on the basis of class group. For each answered question, participants rated their confidence in their recall accuracy on a 5-point Likert scale (where 1 = not very sure and 5 = very sure). A practice question was included at the beginning of the questionnaire to ensure clarity of the task and the instructions. The children were frequently reminded to indicate if they did not understand the task and the instructions. Participants were cautioned not to discuss the task with one another and their performance was monitored by the researcher. The memory test was completed within 40 minutes.

16.3 Results

Feeling of knowing predictions

Participants made one of three judgements in Experiment 4a; an answer, a 'do not know' response or a 'feeling of knowing' judgement. The data analysis was identical to that outlined in Experiment 3b. There were 154 cases and the mean proportion of FOK responses for central and peripheral details are displayed in Table 16.3.1. Each item on the recognition test was classified as either accurate, inaccurate, or don't know. The proportion of feeling of knowing (FOK) judgements and the proportion of FOK accuracy were analysed using the formulae discussed in Experiment 3b. Table 16.3.1 summarized these data together with participants' confidence ratings, across detail and instruction. An overview of the pattern of results revealed that the proportion of FOK judgements appeared to be equivalent across instruction and detail. Separate analyses were conducted to examine the effects of instruction and detail on the proportion of FOK judgements, the proportion of accurate FOK responses, confidence in recognition memory and the FOK-CA gamma correlation. These results are discussed separately.

Table 16.3.1: *Mean number of correct feeling of knowing (FOK) responses, and proportion FOK accuracy across instruction and detail for child witnesses, together with confidence ratings when accurate and inaccurate (and standard deviations).*

	Central Details		Peripheral Details	
	Non-directive	Remember	Non-directive	Remember
No. of correct FOK items	.36 (.68)	.44 (.89)	.92 (1.14)	.90 (1.45)
No. of FOK predictions	1.09(1.47)	1.30 (2.06)	2.26 (2.14)	2.10 (2.52)
Proportion FOK judgements	.42(.04)	.50 (.06)	.41 (.33)	.47 (.47)
Proportion FOK Accuracy	.34 (.05)	.37 (.05)	.41 (.04)	.53 (.06)
Confidence Accurate FOKs	3.86 (.15)	3.52 (.12)	3.67(.12)	3.76 (.11)
Confidence Inaccurate FOKs	3.36 (.14)	3.39(.30)	3.33 (.24)	3.23 (.33)

The Proportion of Feeling of Knowing Judgements

The proportion of FOK responses was calculated from the number of FOK made in Experiment 4a. The results of a two-way, repeated measures ANOVA revealed that neither instructions ($F(1, 152) = 1.27, MSE = .292, p > .05$) nor detail ($F(1, 152) < 1, MSE = .004, p > .05$) had any significant effect on children's FOK judgements. The interaction between the two variables was non-significant ($F(1, 152) < 1, MSE = .130, p > .05$). In contrast, children in Experiment 2b gave more FOK judgements to unanswered central than peripheral detail questions, when memory was assessed 24 hours after the stimulus event was shown. This finding was consistent with the 'accessibility' hypothesis (Koriat, 1993, 1995) which links FOK experiences to the strength of a memory trace. The failure to find a similar effect of trace strength, manifested as a main effect of detail type, in the present study may be due to the immediate testing of participants.

Proportion of Feeling of Knowing Accuracy

The proportion of FOK accuracy was calculated from the recognition answers (Experiment 4b) in response to the FOK judgements made on the recall test (Experiment 4a). The proportion of FOK accuracy ranged from .34 to .53 across the experimental conditions ($M = .42$). Chance performance was (.25) so children were reliable in their predictive accuracy.

This was similar to children's mean predictive accuracy of (.43) in Experiment 2b following a 24 hour retention interval. However, the data from the present study indicated that children were less reliable than adults, whose mean predictive accuracy was .60 (Experiment 3b). A two way, repeated measures ANOVA revealed that instruction ($F(1, 86) = 2.65, MSE = .329, p > .05$) was unrelated to predictive accuracy. An identical result was obtained with adults in Experiment 3b. In Experiment 2b, children were more accurate when they recognised peripheral detail answers they 'knew' than 'remembered'. Predictive FOK accuracy, in the present study, was higher for peripheral than central details recognised ($F(1, 86) = 5.12, MSE = .560, p < .05$). This result was unsurprising as children were more accurate when recalling central details (Experiment 4a). Therefore, there was more scope for improving their memory for peripheral details with the recognition test. The data showed some consistency with the results reported in Experiment 2b. The interaction between instruction and detail was non-significant ($F(1, 86) < 1, MSE = .099, p > .05$).

Confidence in Feeling of Knowing Responses

The results of a three-way, repeated measures ANOVA, to examine the effects of instructions, detail and accuracy on confidence in FOK responses, revealed that participants were equally confident in their responses when given the 'remember' and the non-directive instructions ($F(1, 27) > 1, MSE = 1.995, p > .05$). Central and peripheral detail responses attracted equivalent confidence ratings ($F(1, 27) < 1, MSE = .013, p > .05$). Accurate FOK responses attracted higher confidence ratings than inaccurate ones ($F(1, 27) = 4.78, MSE = 3.148, p < .05$). The interactions between instruction and detail ($F(1, 27) < 1, MSE = .001, p > .05$), instruction and accuracy ($F(1, 27) = 1.93, MSE = 1.277, p > .05$), accuracy and detail ($F(1, 27) < 1, MSE = .356, p > .05$), and instruction, accuracy and detail ($F(1, 27) < 1, MSE = .770, p > .05$) were all non-significant. Neither instructions nor detail influenced confidence in accurate responses, and these results were identical to those obtained with adults in Experiment 3b.

The FOK Confidence-Accuracy Association

A FOK-CA gamma correlation was computed for each individual using the procedure

discussed in Experiment 1b . The mean FOK-CA correlations across the experimental conditions ranged from .04 to .49 ($M = .31$) and this was higher than the mean FOK-CA correlation (.17) obtained with adults in Experiment 3b. The FOK-CA correlations are summarised across instruction and detail in Table 16.3.2. A one-sample t-test of the mean correlations revealed a significant FOK-CA correlation for peripheral details participants when participants were given a 'remember' instruction. A two-way, repeated measures ANOVA assessed the effects of instruction and detail to the FOK-CA correlation. The data revealed that neither the type of pre-question instruction administered ($F(1, 18) < 1$, $MSE = .01$, $p > .05$), nor the type of detail recognised ($F(1, 18) < 1$, $MSE = .01$, $p > .05$), assisted children to match confidence and accuracy when they answered questions for which they previously gave FOK judgements. The interaction between the two variables was non-significant ($F(1, 18) < 1$, $MSE = 1.60$, $p > .05$). Although the data did not conform to the experimental predictions, the results were identical to those obtained with adults (Experiment 3b). There were insufficient cases in Experiment 2b to assess the reliability of children's eyewitness FOK memory. The present data are relevant because they offer an insight into the reliability of children's memory monitoring for FOK knowledge.

Table 16.3. 2: *Mean confidence-accuracy gamma correlations following FOK judgements (and standard deviations) across instruction and detail for children.*

	Central Details	Peripheral Details
Non-directive instruction	.45 (.14) (n=16)	.24 (.11) (n=30)
Remember instruction	.04 (.16) (n=14)	.49 (.17)* (n=19)

* $p < .05$.

16.4 Discussion

The objective of this experiment was to examine if the nature of the pre-test instruction administered to children influenced their memory monitoring for information they could not spontaneously answer, but which they felt was stored in memory and could be

recognised. As in Experiment 3b, the effect of instruction to FOK judgements, predictive accuracy, confidence and the FOK-CA association, was assessed in relation to central and peripheral details. Given the limitations of the results presented in Experiment 2b, this study provided another opportunity to assess if children's memory monitoring skills could be facilitated by encouraging them to report only what they could 'remember' of the witnessed event. Yet given the differences in the research designs in Experiment 2b and this study, a comparison of the results is cautiously made. The FOK study was undertaken because children's memories may benefit from the provision of contextual cues (Ackerman, 1997).

FOK judgements

According to the accessibility hypothesis (Koriat, 1993, 1995), the retrieval of partial or related information underlies FOK experiences (Koriat, 1995). The dual-process model (Koriat & Levy-Sadot, 1999) claims that some FOK experiences may be accompanied by sufficient partial or associated knowledge of the target information, that creates a conscious awareness of information similar to Tulving's (1985) 'remember' retrieval state.

Alternatively, FOK experiences that lack an information basis, may be based on an affective state of awareness that gives rise to a 'feeling' of knowing. Children in Experiment 2b classified more of their accurate recognition answers, for which they previously gave a FOK judgement, as 'known' than 'remembered' at retrieval. Within the context of the remember/know model, children indicated that they had no conscious awareness of their FOK knowledge, but a sense of familiarity (Lories et al., 1998) or knowing the answer. In line with this result, the absence of a conscious awareness of events (Experiment 2b), suggests that it was not possible to encourage children to search for, and retrieve, associated or partial material related to the target question (Experiment 4b). The main conclusion is that proportion of FOK judgments, computed in relation to the proportion of 'Don't know' responses, is unaffected by the nature of the pre-test instruction.

Central and peripheral details attracted an equivalent proportion of FOK judgements. The results were identical to those obtained with adults (Experiment 3b). In contrast, a 24-hour retention interval led to a high proportion of FOK judgements for unanswered peripheral detail questions given by children (Experiment 2b). The difference

in the results obtained in Experiment 2b and the present study may be explained in the following way. The recency of the target information (Reder, 1987) determines FOK judgements. If there was insufficient time for memory to decay, it is possible that children felt that they had the information to all unanswered questions, central and peripheral to the observed event. Since there was also no effect of detail type on adults' FOK judgements (Experiment 3b), this explanation also applies to adult performance.

Instruction and FOK predictive accuracy

The mean proportion of accurate FOK responses was ($M = .42$) which was higher than chance performance (.25), but similar to children's performance in Experiment 2b (.43). Children in this experiment displayed good memory monitoring for prospective memory, reinforcing the optimism of some metamemory theorists that people are good memory monitors (e.g., Koriat, 1998; Reder & Ritter, 1992). Other theorists are less optimistic and claim that the accuracy of FOK judgements is above chance but far from perfect (Leonesio & Nelson, 1990). Nevertheless, the data presented in the thesis are relevant because they offer an insight into the cognitive conditions underlying children's FOK eyewitness memory, which to date, remain unexamined in the literature. There was no effect of a 'remember' instruction to children's predictive, recognition accuracy. This was identical to the findings reported in Experiment 2c in which children's recognition memory was not better during a 'remember' than a 'know' retrieval state. More importantly, the result follows from the discussion outlined in the preceding paragraph. Children's FOK experiences were unrelated to instruction, so this variable had no effect on recognition performance.

Although an equivalent proportion of FOK judgements was made for unanswered central and peripheral detail questions, participants were more accurate in recognising peripheral than central detail information. This fits with the data reported in Experiment 4a in which memory for central details was more accurate, confident and associated with higher CA correlations than memory for peripheral details. Consequently, there was more room for improving peripheral detail memory with the additional cues present in a recognition test. In contrast, there was no effect of detail type in adult predictive accuracy (Experiment 3b) although their central detail memory was better (Experiment 3a). This

implies that children benefited more than adults for the additional cues present in the recognition test (Gee & Pipe, 1995). The differences in the proportion of predictive accuracy across age and time of test are displayed in Figure 16.4.1.

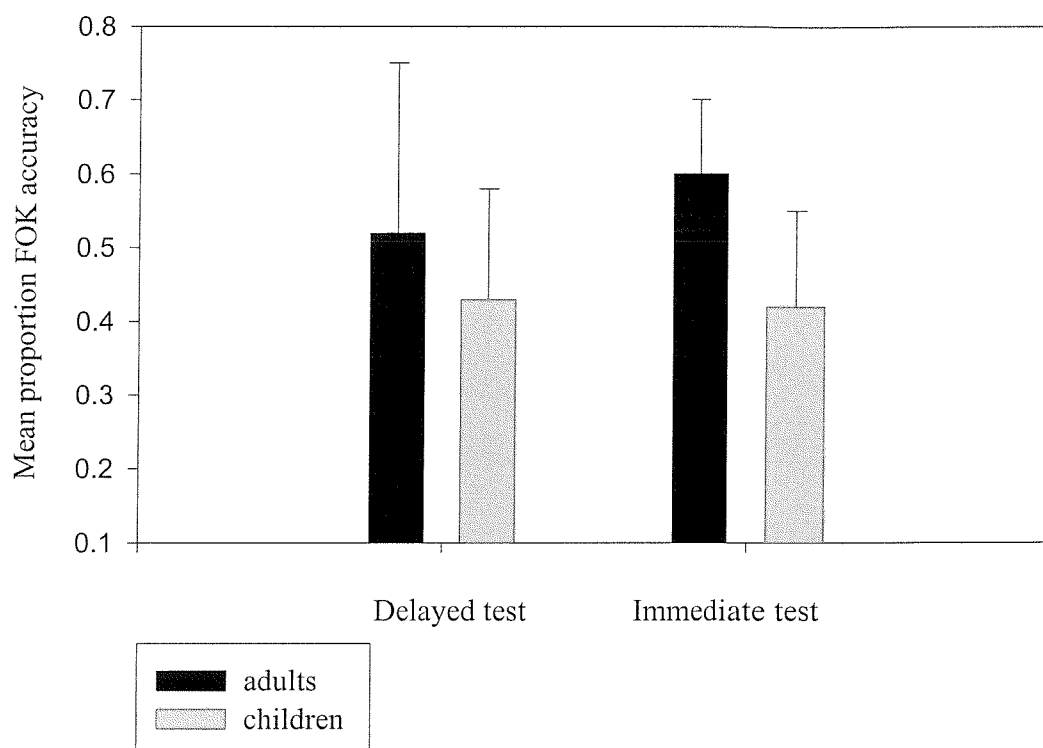


Figure 16.4.1: Proportion of accurate FOK responses across test and time, with standard deviation bars.

Although there are limitations in comparing the results of the delayed and immediate memory test, adults appeared to be more efficient than children, at predicting that they can accurately recognise an answer that they cannot initially recall. Children's poor FOK accuracy, relative to that of adults, may reflect a task demand. If children felt a sense of inadequacy when they were unable to answer a question, they may have overestimated their belief in prospective recognition memory. This does not mean that adults were unaffected by a similar demand to produce an answer. The demand effect has been shown to reduce

adult FOK accuracy (Widner et al., 1996), but it could have a more pronounced effect on children's judgments of their FOK knowledge. An alternative explanation is that children simply overestimated their ability. Pressley and Ghatala (1989) reported that children gave accurate judgements of learning for easy items on test, but they over estimated their performance for the difficult items.

Despite their poor performance, FOK accuracy was above chance level (.25), although far from perfect (see Figure 16.4.1). An important finding is that children's memory for peripheral details they could not initially recall, improved on a recognition test. This is forensically relevant given the arguments outlined in the Introductory Chapter of this thesis. To briefly recap, barristers and legal personnel expect that children have an equivalent ability to report information central and peripheral to an eyewitnessed event (Davies et al., 1997). Yet, there is some evidence from the literature (e.g., Gobbo, 2000) and Experiment 4a, that children's memory for central details can be more reliable than their memory for peripheral details. FOK predictive accuracy demonstrates that retention can exceed recall, and recognition is superior to recall (Hart, 1965). Hence, giving children a second opportunity to retrieve information is important.

The FOK-CA Association

Participants were more confident when they accurately recognised answers, than when they were inaccurate. However, the key research issue was to examine the effects of instruction and detail to confidence and the FOK-CA association. There was no evidence that instruction or detail was related to confidence, although detail determined predictive accuracy as mentioned in the preceding paragraph. Consequently, it was unsurprising that the FOK-CA association was unaffected by the nature of the pre-test instruction administered to participants, and the type of detail recognised. The results also relate to one of the main problems associated with trying to improve the confidence-accuracy association. A variable that affects accuracy, may have no influence on confidence (Leippe, 1980). This explanation can be applied to another form of CA monitoring; that is, the FOK-CA association. The main conclusion in this section of the thesis is that the nature of the pre-test instruction does not facilitate FOK-CA processing. It should be noted, however, that the FOK-CA correlation for peripheral details obtained with the 'remember' instruction

(.49), was significantly different from the mean. Given Koriat and Levy-Sadot's (1999) suggestion that some FOK experiences have a 'remember' component, this warrants further investigation. Overall, the present data are important because there were insufficient cases in Experiment 2b to examine the effect of the state of awareness accompanying retrieval and detail, to strength of the FOK-CA correlation.

Conclusion

Metacognitive judgements, like the feeling of knowing experience, play an important part in regulating information retrieval and behaviour (Koriat, 1998). This is particularly true in an eyewitness context in which the inability to spontaneously recall an answer to a question, can either trigger a feeling that the information is stored or a feeling of not knowing the answer. If an individual believes that the information is stored, the search for the answer, or some fragment of it, continues. Hence, the need to examine the accuracy and reliability of these feelings of knowing or 'feel of memory' (Glenberg, 1997), particularly when the target information may relate to a vital piece of forensic evidence. Participants were more accurate when spontaneously recalling central details (Experiment 4a), so there was more scope for improving their memory for peripheral details. The improvement in recognition memory in the present study can be attributed to the presence of the cues present in the alternative answers on the test which provided a context for memory. Given this positive finding, the final experiment in the thesis focussed on children's recognition memory. The 'remember' instruction improved adults' recognition accuracy (Experiment 3a) and it was expected to assist children's response accuracy, confidence, and strengthen the confidence-accuracy association.

CHAPTER SEVENTEEN

Experiment 4c: The Relationship between States of Awareness Instructions and Confidence-Accuracy Decisions for Children's Immediate Recognition

"Retrieval cues will be effective only if a memory trace has been stored, improvement in reporting is fundamentally a matter of enhancing the respondent's access to that memory."

(Lee, Brittingham, Tourangeau, Willis, Ching, Jobe, & Black, 1999)

17.1 Introduction

Experiment 4c was based on evidence of the effectiveness of a 'remember' pre-test instruction. Although a 'remember' state of awareness accompanying retrieval was unrelated to children's recognition accuracy (Experiment 2c), the 'remember' instruction improved adults' recognition accuracy (Experiment 3c), and children's recognition of peripheral details they were unable to spontaneously recall (Experiment 4b). In Experiment 4b, children were able to match confidence and accuracy for the peripheral details they recognised, when they were given the 'remember' instruction. These results justified the examination of the role of instruction in improving children's recognition accuracy, confidence and the strength of the CA association. The study was a replication of Experiment 3c, and it was conducted with 9-10 year olds.

Some experiments report that children perform well on an immediate recognition test (Holliday & Hays, 2000; Toplis, 1997). Developmental psychologists express a concern that an immediate recall test may inoculate against forgetting, but there is the danger that an immediate recognition test creates false memories (Brainerd & Reyna, 1996). This implies that the alternative answers on the recognition test constitute post-event information which children may confuse with the actual event (Ackil & Zaragoza, 1995; Day et al., 1998; Parker, 1995). One way of avoiding this is to request children to information only if they can remember seeing or hearing it. This instruction was more effective when adult were encouraged to be consciously aware of events prior to retrieval (Experiment 3c), rather than during retrieval (Experiment 1c). Children's recollective-based answers were as accurate as answers they 'knew' (Experiment 2c), but a 'remember' state prior to retrieval was expected to benefit children, as it did adults.

Various strategies are employed to increase children's accuracy by reducing their reliance on schematic recall or their incorporation of post event material. One successful strategy is the explicit instruction to generate images or engage in mental context reinstatement before answering or while responding to a question (Experiment 4a; Foley, Wilder, McCall & Van Vorst, 1993). Consequently, it was expected that recognition accuracy and memory monitoring efficiency would benefit from the focussed 'remember' instruction. Given the premium placed on children's ability to separate their personal experiences from information they generally know (Poole & Lindsay, 1998), the administration of the 'remember' pre-test instruction was expected to improve recognition accuracy, confidence and the magnitude of the CA correlation. Given the results obtained in Experiment 4a, children's central detail memory was expected to be reliable. This would be reflected in recognition accuracy, confidence and the strength of the CA correlation.

17.2 Method

Design

The experimental design was identical to the one used in Experiment 3c.

Participants

One hundred and ten children (60 boys, 50 girls) ranging in age from 9-11 years ($M = 10$ years, 4 months), participated in the study. They were recruited from Shirley Junior School and Northam Primary School in Southampton. Participants were randomly assigned on the basis of class groups to a 'remember seeing' ($n = 58$) or a non-directive ($n = 52$) instruction group. The gender of the participants was matched as far as possible across the experimental groups.

Materials

The materials and questionnaire were identical to those used in Experiments 3c.

Instructions

The instructions were identical to the ones used in Experiment 4b and they were administered to children verbally and also written on the test questionnaire as a reminder

during the self-administered test. The questions on the recognition test were read to the children and were also written on the questionnaire. During completion of the test, care was taken to ensure clarification of the task and the instructions.

Procedure

Participants watched the event in groups of 20-23 students after which they completed a surprise memory test in the form of a self-administered questionnaire. The experimenter read the instructions to the class, and participants then completed the cued-recall memory test. For each answered question, they rated their confidence in their recall accuracy on a 5-point Likert scale (where 1 = not very sure and 5 = very sure). A practice question was included at the beginning of the questionnaire to ensure clarity of the task and the instructions. The children were frequently reminded to indicate if they did not understand the task. Participants were cautioned not to discuss the questions with one another and their performance was monitored by the researcher and two teachers. The task lasted 45 minutes.

17.3 Results

Eyewitness Recognition

The data analysis was identical to that outlined in Experiment 3a. For each item on the recognition test responses were categorized as either accurate, inaccurate, or don't know. The responses to the questions were scored in a 'blind' fashion; that is, regardless of the type of detail reported. This was done to prevent any bias in the data analysis. Table 17.3.1 displays participants' performance and confidence ratings, across central and peripheral details, for the 'remember' and 'non-directive' instructions.

Total number of questions answered. The overall level of eyewitness responses was evaluated, regardless of accuracy. The total number of questions participants answered provides an indication of the total amount of information pertaining to an eye-witnessed event that can be immediately recognised. Thirty questions were asked and the mean number of questions answered and (standard deviation) were 28.85 and (2.39). Children appeared to be more efficient at recognising than recalling information. In Experiment 4a the mean total number of questions answered and (standard deviation) was 21.84 (5.40). Children recognised 96 percent of what they saw, compared to 73 percent of what they

were able to recall (Experiment 4a).

A two-way, repeated measures Analysis of Variance (ANOVA) assessed the effects of instructions and detail to the total number of questions answered. As with children's recall, instruction had no significant effect on the quantity of information reported ($F(1, 108) < 1$, $MSE = .66$, $p > .05$). The number of questions answered, out of 30, when participants were given the 'remember' and 'non-directive' instructions was 28.74 and 28.96 respectively. Therefore, it seems unlikely that (1) the 'remember' instruction made participants more conservative in responding to questions, than the 'non-directive' instruction, and (2) that the 'non-directive' instruction elicited information that was also 'remembered'. A larger number of central than peripheral details were recognised ($F(1, 108) = 4.52$, $MSE = 5.35$, $p < .05$). The interaction the two variables was non significant ($F(1, 108) = 2.37$, $MSE = 2.81$, $p > .05$). The means (and standard deviations) for each experimental condition are summarised in the first row of the data presented in Table 17.3.1.

Table 17.3.1: *Mean number of questions answered, correct responses, incorrect responses, don't know responses and proportion accuracy across instruction and detail for child witnesses, together with confidence ratings when accurate and inaccurate (and standard deviations).*

	Central details		Peripheral details	
	Non-directive	Remember	Non-directive	Remember
No. of questions answered	14.75 (.76)	14.41 (1.85)	14.21 (1.40)	14.33 (1.40)
No. of correct responses	10.06 (1.86)	9.71 (1.84)	9.62 (2.16)	9.22 (1.85)
No. of incorrect responses	4.69 (.27)	4.71 (.24)	4.60 (.26)	5.10 (.25)
No. 'don't know' responses	.25 (.76)	.59 (1.85)	.79 (1.41)	.66 (1.40)
Proportion Accurate	.68 (.10)	.69 (.09)	.68 (.11)	.65 (.09)
Confidence when accurate	4.34 (.09)	4.33 (.17)	3.90 (.12)	4.00 (.11)
Confidence when inaccurate	3.23 (.17)	3.40 (.18)	3.35 (.12)	3.36 (.15)

Number of correct responses. The mean number of questions participants correctly answered was 19.28, or 64 percent, of the 30 questions asked. A two-way, repeated measures (ANOVA) of the mean total correct responses by instruction and detail revealed no significant effect of instruction type to the number of correct responses ($F(1, 108) = 1.62$, $MSE = 7.55$, $p > .05$). There were more accurate central than peripheral details ($F(1, 108) = 4.24$, $MSE = 11.73$, $p < .05$). The interaction between the two variables was non-significant ($F(1, 108) < 1$, $MSE = .02$, $p > .05$). The mean numbers of correct responses across instruction and detail were summarised in the second row of Table 13.3.1.

The mean number of incorrect responses was 9.56 or 32 percent of the questions asked. The mean number of incorrect responses across experimental conditions were listed in the third row of the data in Table 13.3.1. An ANOVA analysis to evaluate the effects of instruction and detail on the mean number of incorrect responses revealed that neither instruction ($F(1, 108) < 1$, $MSE = 3.73$, $p > .05$) nor detail ($F(1, 108) < 1$, $MSE = 1.24$, $p > .05$) and any significant effect on performance. Similarly, the interaction of the two variables was not significant ($F(1, 108) = 1.53$, $MSE = 3.34$, $p > .05$).

An overview of the data displayed in Table 17.3.1 suggests that the key measure of eyewitness performance in the study, the proportion of accurate responses, were equivalent across detail type. The effects of instruction and detail on accuracy, confidence and the confidence-accuracy relationship were examined using an ANOVA analysis.

Proportion of Accurate Responses

The proportion of accurate responses ranged from .65 to .69 ($M = .68$) and this was marginally lower than the mean of (.71) obtained with adults under identical testing condition, in Experiment 3c. Children appeared to be more accurate on this immediate recognition test ($M = .68$), than when the recognition test was administered after 24 hours ($M = .60$). But little can be drawn from this comparison given the difference in the two studies. Children's recognition accuracy in this study ($M = .68$) was higher than their recall accuracy ($M = .59$), observed in Experiment 4a.

The results of a two-way, repeated measures ANOVA to assess the effects of instruction and detail to the proportion of accurate responses, failed to confirm any advantage to children's recognition accuracy when a 'remember' instruction was

administered ($F(1, 108) < 1$, $MSE = .01$, $p > .05$). This was inconsistent with the benefits derived from the 'remember' instruction to adult recognition accuracy (Experiment 3c). Perhaps children's performance did not improve with the 'remember' instruction because they reached their maximum performance. This explanation was based on the small range of the mean proportion of accurate responses across the experimental conditions (see Table 17.3.1). In contrast, adult recognition accuracy ranged from .61 to .71 (Experiment 3c) so there was more room for improvement with the 'remember' instruction.

The present data were also in line with evidence that children's recognition accuracy was equivalent for their remember and know-based answers (Experiment 2c) and that the 'remember' instruction did not significantly improve their FOK recognition memory (Experiment 4b). Contrary to the experimental prediction, central and peripheral details were recognised equally well in the present study ($F(1, 108) = 2.21$, $MSE = .02$, $p > .05$). The interaction between instruction and detail was non-significant ($F(1, 108) < 1$, $MSE = .88$, $p > .05$).

Confidence in Response

A three-way, repeated measures ANOVA examined the effects of instruction, detail and response accuracy to confidence. Contrary to experimental predictions, instruction had no significant effect on confidence ratings ($F(1, 106) < 1$, $MSE = .27$, $p > .05$) but participants were more confident when they recognised central details ($F(1, 106) = 18.50$, $MSE = 3.13$, $p < .001$) and when they were accurate ($F(1, 106) = 261.516$, $MSE = 68.42$, $p < .001$). The interactions between instruction and detail ($F(1, 106) < 1$, $MSE = .01$, $p > .05$) and instruction and accuracy ($F(1, 106) < 1$, $MSE = .14$, $p > .05$) were all non-significant. However, there was a significant interaction between accuracy and detail ($F(1, 106) = 30.96$, $MSE = 4.84$, $p < .001$). Analysis of the simple main effects revealed a greater difference in confidence levels between accurate and inaccurate central details ($t(107) = 15.43$, $p < .001$), than accurate and inaccurate peripheral details ($t(109) = 10.10$, $p < .001$). This is displayed in Figure 17.3.2 on the next page. No significant three-way interaction between instruction, accuracy and detail emerged ($F(1, 106) = 3.11$, $MSE = .49$, $p > .05$) to qualify the previous two-way, interaction.

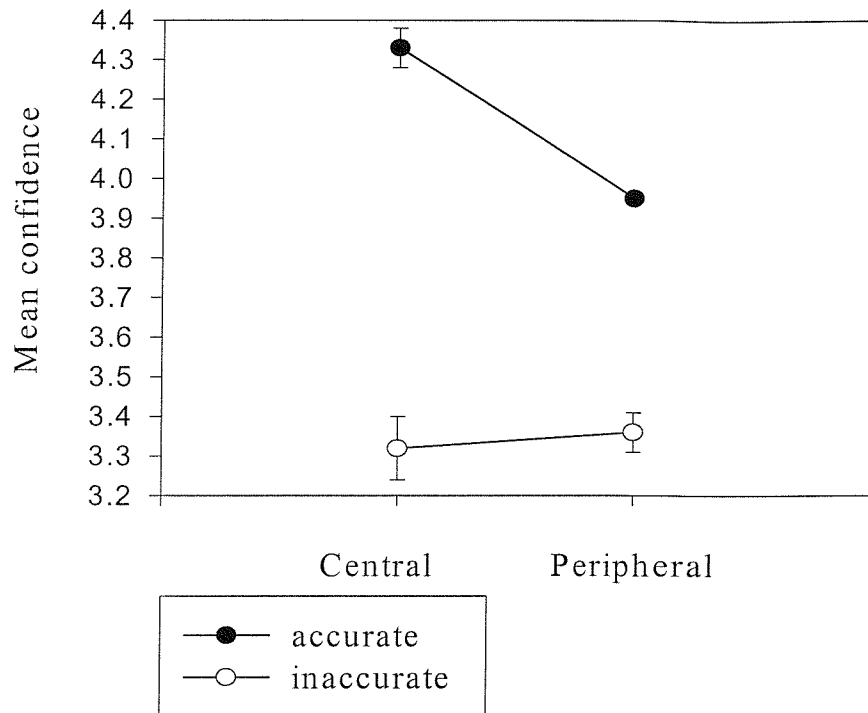


Figure 17.3.2: The effect of detail and accuracy on confidence, with standard error bars.

The Confidence-Accuracy Association

The confidence-accuracy relationship was examined using Goodman-Kruskal gamma correlation. Table 17.3.3 summarizes the correlational data, across instruction and detail. Modest to high confidence-accuracy correlations were obtained in all conditions. A one-sample t-test of the mean revealed that they were all significantly different from zero. There was consistent evidence that the CA correlations for central details were higher than the CA correlations for peripheral details. Instruction did not appear to influence the strength of the mean CA correlations.

Table 17.3.3: *Mean confidence-accuracy gamma correlation (and standard deviation) across instruction and detail.*

	Central Details	Peripheral Details
'Non-directive' Instruction	.70 (.11)	.40 (.13)
'Remember' Instruction	.59 (.09)	.42 (.11)

(All gamma correlations were significantly greater than zero at $p < .001$.)

The results of a two-way, repeated measures ANOVA to examine the effects of instructions and detail to the CA correlations revealed no significant effect of instruction ($F(1, 106) < 1$, $MSE = .07$, $p > .05$) to the CA association. The data were consistent with the results obtained in Experiments 3a, 3c, and 4a. There was a significant effect of detail ($F(1, 106) = 18.21$, $MSE = 3.17$, $p < .001$). Specifically, the CA correlations for central details were higher than those for peripheral details. The interaction between the two variables was non-significant ($F(1, 106) = 1.02$, $MSE = .18$, $p > .05$).

17.4 Discussion

The objective of this study was to examine if accuracy, confidence and CA resolution during a recognition task could be facilitated with a 'remember seeing' than a non-directive instruction. Contrary to the experimental predictions, instruction had no significant effect on eyewitness performance when measured as the total number of questions answered, the number of correct answers given, the proportion of accurate responses, confidence in reports or the strength of the CA association. There was instead evidence that central detail memory was better on all the above measures. These results were similar to those obtained in Experiment 2c. The theoretical and forensic implications of the data are discussed.

The effectiveness of a 'remember' instruction to the CA association

Recognition accuracy

The proportion of accurate responses ranged from .65 to .69 ($M = .68$) across the experimental conditions, and this small range in the data across the experimental conditions implied that children reached their maximum capacity for recognising information. The experimental predictions were based on the results obtained with adults (Experiment 3c)

and Tulving's belief that a richer retrieval cue, that initiates retrieval and encourages mental context reinstatement, would improve accuracy. The prediction was not upheld, but the data suggested that the effectiveness of a retrieval cue is restricted by the capabilities of the rememberer. An alternative explanation for the data resides in fuzzy-trace theory which claims that children may falsely recognise 'distractors' on a test. False recognition may be due to a source monitoring error. The alternative responses on a multiple-choice test may preserve the gist or some salient details of other target events, so children misattribute information on distractor items to their recollections (Brainerd & Reyna, 1998). This explanation is plausible since the distractor items present in the recognition test did in fact contain information pertinent to other aspects of the film-event. Other researchers share the view that irrelevant cues will have a suggestive function and mislead children into making errors (Pipe, Gee & Wilson, 1993).

Nevertheless, when children's performance was compared with the results reported in the literature, the present data indicated that the participants in this study were reliable in reporting events. In one study, 8 year olds had an accuracy rate of 75 percent, chance performance was 50 percent, when they were asked to recognise nouns immediately after they were presented (Brainerd & Reyna, 1996, Experiment 1). The complex sequence of events and number of persons shown in the present eyewitness experiment, required greater memory and source monitoring skills than is possibly needed during the recognition of nouns. Consequently, children's performance in the present study was good, in comparison with the data presented by Brainerd and Reyna.

Central and peripheral details were recognised equally accurately, and the same result was obtained in Experiment 2c. The data from Experiment 2a revealed a central detail accuracy bias in both instruction conditions. In contrast, in the present study both types of details were accurately recognised. This is relevant because the legal system requires knowledge of all information central or salient to an event, as well as the background, peripheral information. Recognition accuracy appeared to be better than recall accuracy (Experiment 4a), in improving memory for central and peripheral details. There was also an improvement in children's recognition accuracy when memory was tested immediately, than after 24 hours. The mean proportion of accurate responses increased from (.60) in Experiment 2c after a retention interval of 24 hours, to (.68) in this study.

Confidence

Contrary to the experimental prediction, the type of instruction administered had no significant effect on children's confidence in the accuracy of their reports. This result was identical to that obtained in Experiment 2c. However, children were more confident in their recognition of central than peripheral details. Overall, participants demonstrated good metamemory skills because they were more confident when they gave an accurate, than an inaccurate answer. An interaction between accuracy and detail emerged, in which the difference in confidence between accurate and inaccurate central details was higher than the difference in confidence between accurate and inaccurate peripheral details. There was no support for the prediction that CA resolution is more reliable when a 'remember' instruction is administered. This result was not surprising as instruction had no significant effect on participants' accuracy or confidence. However, CA decisions were more reliable for central details. These results were identical to those obtained in Experiment 2c.

Conclusion

Taken together the results of Experiment 2c and 4c demonstrated the limitations of being able to remember complex eyewitnessed events. Incorrect recognition of distractor items can undermine the benefits of a richer, 'remember' retrieval instruction. The most consistent finding was that confidence-accuracy resolution was affected more by the type of detail reported, than the retrieval instruction administered. The common findings across Experiment 4a, 4b and 4c are outlined in the next chapter.

CHAPTER EIGHTEEN

Overview of Experiments 4a, 4b and 4c

Although we have little control over the way children's memories are stored, we have considerable control over the conditions under which these memories are retrieved. (Brainerd & Reyna, 1996). This is particularly true of children's memories for an eyewitnessed event. This series of experiments replicated Experiments 3a, 3c and 3c, with 9-11 year olds in order to assess if a 'remember' pre-test instruction could have the same benefits for children, as they did for adults (Experiments 3a, 3c). The impetus for the research was based on the predictions outlined in Tulving's remember/know model and the Source Monitoring Framework (e.g., Johnson et al., 1993). The experiments were also based on the results obtained in Experiment 2a. Data from Experiment 2a revealed that children who reported that they 'remembered' the answer to a question, were more accurate than those children who 'knew' the answer. Children's recognition memory (Experiment 2c) also benefited from a 'remember' state of awareness at retrieval. Specifically, confidence-accuracy resolution was better for central than peripheral detail answers, but only when children remembered the information.

The literatures suggests that children are less reliable witnesses than adults (Foley & Ratner, 1998; McBrien & Dagenbach, 1998), and this is due to, among other factors, children's difficulty in retrieving information (Pipe, Gee & Wilson, 1993). Creating a remember state of awareness prior to retrieval, through the use of a pre-test instruction, offered the potential for significantly improving the quality and accuracy of children's statements. Several episodic trace models like SAM (Raaijmakers & Shiffrin, 1992) and the GAPS framework (Tulving, 1983) emphasise the importance of context in successful retrieval. Context refers to the body of knowledge contained in episodic memory which is linked to some memory for a specific target detail. Research indicates that children benefit from the provision of guided retrieval instructions in accessing the context and target information (Memon et al., 1996; Miller et al., 1996). Hence, the manipulation of the state of awareness prior to retrieval, via a 'remember' instruction, was expected to be beneficial to children's accuracy and their ability to reliably match confidence and accuracy.

18.1 Remembering, eyewitness memory and metamemory

Efficient cognition requires efficient memory monitoring. The importance of accessing the context in which some specific item of information is located, by being able to mentally reinstate and remembered those events, was examined in relation to response accuracy and the CA association. The discussion focusses first on recall, and then recognition memory. Figure 18.1 shows that children's recall accuracy improved when a 'remember' state of awareness was encouraged prior to reporting an event, through the use of a pre-test instruction. However, the advantage associated with remembering did not extent to recognition memory. This contradiction in the data is explained in relation to children's performance in Part One of the thesis.

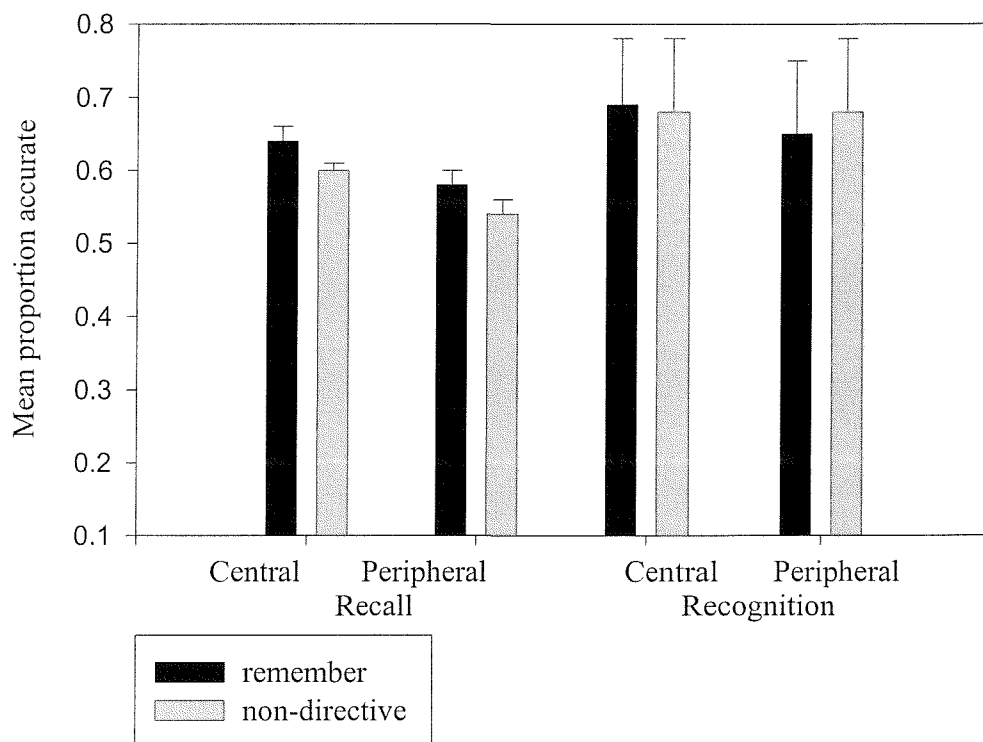


Figure 18.1: The effectiveness of a 'remember' pre-test instruction to children's central and peripheral detail accuracy, with standard deviation bars.

Recall

The 'remember' instruction significantly improved children's recall more than the non-directive instruction (Experiment 4a), in the same way as a 'remember' state of awareness at retrieval was associated with more accurate responses, than a 'know' retrieval state (Experiment 2a). There were benefits to both the quantity of information reported as well as the accuracy of these answers. For example, the remember retrieval instruction led to an increase in the number of peripheral detail questions children were able to answer, compared to the administration of the non-directive instruction (See figure 15.3.2). Since children are better at recalling central than peripheral details, and peripheral details may contain critical clues to assist police investigations, the improvements to memory with a remember-based pre-test instruction is a relevant finding. More accurate answers were given in response to the 'remember' than the 'non-directive' instruction, regardless of the type of detail reported. Overall, the proportion of accurate responses children recalled improved when they were requested to report only what they can remember seeing and hearing of the eye-witnessed event.

The data were consistent with the views expressed by some developmental psychologists that controlling the conditions at retrieval can lead to improvements in the accuracy and quality of the memories reported (Brainerd & Reyna, 1996; Pipe et al., 1993). There was no overall effect of the 'remember' instruction to confidence, but the effect of detail type to confidence was moderated by instruction. Specifically, central details were more confidently reported than peripheral details, but only when the 'remember' instruction was administered. In contrast, the state of awareness accompanying retrieval was unrelated to confidence (Experiment 2a). There was no evidence that a 'remember' pre-test instruction strengthened the CA association, and this result was identical to the one obtained in Experiment 2a. The primary goal of the experiments was to assist children to reliably match confidence and accuracy. It was expected that asking children to report only what they can 'remember seeing and hearing' of the target event they were describing, would strengthen the CA association. However, this prediction was unsupported. The pattern of results reveal why CA resolution may be difficult. Leippe (1980) explains that a variable may influence accuracy, but it have no effect on confidence, as demonstrated in Experiment 2a. Alternatively, the effect of that variable on confidence may be moderated

by the presence of another variable, as shown in Experiment 4a.

There was, however, more consistent evidence of an effect of detail type to accuracy, confidence and CA resolution. Performance on all three measures was better for central details. The data were in line with attentional focus theory and the SAM model, both of which link successful retrieval to the strength of the memory trace. In contrast, the central detail accuracy bias was eliminated during a 'remember' state of awareness at retrieval, but not during a 'know' retrieval state (Experiment 2a). This contradiction in the results obtained in Experiments 4a and 2a may be due to the difference in the nature of the task employed in the two experiments. In Experiment 2a, each answered question was accompanied by a source and a remember/know judgement. According to the source monitoring framework (Johnson et al., 1993; Johnson, 1997) the presence of these judgements raises the criterion of accuracy for all information. A source monitoring task was not included in Experiment 4a. Requesting participants to report only what they can 'remember seeing or hearing' of the event in question, does not guarantee that the memory for the context of the incident being described, also included memory for the source of the information.

Recognition

It was expected that the 'remember' instruction would improve recognition memory in the same way as it facilitated children's recall (Experiment 4a). However, there was no evidence that the 'remember' pre-test instruction improves the quantity of information recognised, the number of correct responses, the proportion of accurate answers, confidence in memory, or the ability to match confidence and accuracy. This may be due to the difference in the nature of a recall and a recognition task. Recognition is judged to be an easier task than recall because it involves less cognitive effort (Robinson & Johnson, 1996). The effectiveness of the 'remember' instruction should be more effective on a recall task than a recognition one. There is limited contextual information in a cued-recall question to guide memory, so successful recall relies on the ability to mental reinstate the experience (e.g., Haist et al., 1992). In contrast, recognition is based on the ability to discriminate 'old' from 'new' items on the test, and memory can be jogged by the alternative answers. Consequently, a deliberate, conscious search for the target material may not be necessary.

This may explain the difference in the results obtained in Experiments 4a and 4c.

A comparison of participants' recognition performance across age revealed that the remember instruction enhanced adults' recognition accuracy (Experiment 3c), but not children's recognition accuracy (Experiment 4c). Similarly, a remember state of awareness at retrieval was unrelated to children's recognition accuracy (Experiment 2c). An examination of the range of the mean proportion of accurate responses, from the lowest to the highest mean, across age, revealed a range of 4 for children (Experiment 4c) and 10 for adults (Experiment 3c). The mean proportion of accurate responses was lower for children than adults. This suggests that children were unable to increase their capacity for correctly recognising information, regardless of the phrasing of the pre-test instruction. Theoretically, the remember instruction represented a more optimal retrieval condition, than the non-directive instruction. However, the data illustrated the limitations imposed on the ability to remember an event. Retrieval cues will be effective only if a memory trace has been stored (Burgess & Shallice, 1996; Lee et al., 1999).

The SMF and the remember/know model give a global prediction that confidence in performance improves when there is a conscious awareness of events. A different pattern of results emerged across Experiments 4a and 4c. Remembering increased confidence in central detail memory (Experiment 4a), but it was unrelated to recognition performance (Experiment 4c). Similarly, a 'remember' state of awareness at retrieval was unaccompanied by an increase in confidence (Experiment 2c).

The effect of detail type on children's performance varied. Memory for central details was more accurate; however, central details were more confidently reported than peripheral details, only when participants were given a 'remember' instruction (Experiment 4a). Confidence varied more between accurate and inaccurate central detail reports, than accurate and inaccurate peripheral detail reports. Some experiments conclude that children's memories for central details is better (e.g., Cassel & Bjorklund, 1995; Gobbo, 2000; Poole & White, 1991), and the present data supported the literature. A relevant finding for the meta-memory literature which has a forensic application, is that CA resolution is more reliable for central than peripheral details. This occurred during recall (Experiment 4a) and recognition (Experiment 4c) testing.

Given the premium placed on accuracy in the courtroom, it is relevant that the court

understands the conditions under which children are likely to be both confident and accurate. The identification of the cognitive conditions that improve children's CA resolution, means that these cognitive factors can be specifically enhanced to facilitate children's memories. The emerging pattern of data across the experiments outlined in Part Two of the thesis, across age and test, is that CA resolution is reliable for central detail reports. It appears that little can be done to improve accuracy and CA resolution by using a 'remember' instruction to encourage participants to contextualize an event before reporting it. The strong central detail accuracy bias in all most of the experiments suggested that peripheral information was not attended to, or it was weakly encoded. An alternative way of improving memory is to give participants who have a partial memory trace, or a 'feeling of knowing' the answer, a second opportunity to retrieve information by providing more contextual cues on a recognition test.

18.2 Remembering and feeling-of-knowing (FOK) predictive accuracy

The examination of the reliability of children's FOK judgements is both theoretically and forensically relevant. FOK experiences demonstrate that memory monitoring continues in the absence of retrieval. The objective of the research was to identify how detail and instruction influence FOK experiences, predictive accuracy, confidence and the FOK-CA association. Koriat and Levy-Sadot (1999) proposed a dual process model for FOK experiences in which some FOK's are based on an affective 'hunch' that knowledge is available, while others FOK's have strong partial information basis. These theorists link FOK hunches to the 'know' component of the remember/know model, and the retrieval of partial information to the 'remember' component of the model. A 'know' state of awareness accompanied children's predictive accuracy (Experiment 2b), so there may be some evidence that FOK judgements are based on a feeling of familiarity (Koriat & Levy-Sadot, 1999; Lories et al., 1998). Given this lack of conscious awareness of events when they recognised information, for which a FOK judgement was made, it was perhaps unsurprising that the 'remember' pre-test instruction failed to produce sufficient partial information that triggers a FOK.

Central and peripheral details attracted an equivalent proportion of FOK judgements (Experiment 4b) and this was consistent with adults' FOK experiences (Experiment 3b).

The key finding was that the central detail accuracy bias in recall (Experiment 4a), offered more scope for improving memory for peripheral details with a recognition test.

Consequently, predictive accuracy was above chance level, but higher for peripheral than central details. This led to a significant FOK-CA correlation for peripheral details remembered. Participants were more confident when they accurately recognised peripheral details, than when they inaccurately recognised them, but this occurred only when they were given the 'remember' pre-test instruction. Perhaps there is some basis for Koriatic and Levy-Sadot's belief that some FOK experiences have a 'remembered', 'visual' component similar to the one that underlies a tip-of-the-tongue (TOT) experience. This warrants further research. To answer the critical research question examined in the FOK experiments, there was no overall effect of instruction or detail on the FOK-CA association.

Conclusion

A variety of interviewing styles has been used to increase the accurate retrieval of children's memories. Yet, the data from this series of studies revealed that the success of a retrieval strategy depends on the centrality of the detail observed and reported. Thus, the effect of detail can modify the advantage to performance that would normally be expected with a 'remember' instruction or a 'remember' state of awareness. The final chapter addresses the main conclusions and contributions of the thesis.

CHAPTER NINETEEN

Contribution and Conclusion of the thesis

“Research into improving the confidence-accuracy correlation and understanding what factors may detrimentally affect the confidence-accuracy relationship remain important.”

(Smith, Lindsay & Pryke, 2000)

19.1 Introduction

The experiments reported in this thesis responded to the mandate by Smith et al. (2000) that an understanding of the factors that facilitate or impair the CA relationship is important. The examination of a witness's ability to reliably match confidence and accuracy is theoretically relevant, because it provides an insight into the cognitive conditions that accompany efficient memory monitoring. More importantly, given the weight jurors place on eyewitness confidence as a measure of accuracy (Brewer et al., 1999; Shaw et al., 1999), it is relevant to identify the retrieval conditions or detail type that leads to a valid CA association.

The primary contribution of the thesis was the application of the remember/know procedure to the study of eyewitness memory. The literature suggests that eyewitnesses are not more confident when they are accurate, than inaccurate (Bornstein & Zickafoose, 1999; Thompson & Mason, 1996). Stated another way, confidence does not imply accuracy. Consequently, the improvements in accuracy and confidence that accompany a 'remember' state of awareness at retrieval, (Experiments 1a, 2a; Hyman et al., 1998), was expected to strengthen the eyewitness CA association. The ability to 'remember' information improved performance (Part One of the thesis). Based on this result, a 'remember' state of awareness was encouraged prior to questioning through the use of a remember pre-test instruction (Part Two).

In the overview chapters in Part Two of the thesis (Chapters 14, 18), the results obtained in Part Two were compared with those obtained in Part One. These comparisons are tentatively made given the differences in the methodology and research designs employed in the two parts of the thesis. Figure 19.2.1 on the next page provides a visual reminder of the results obtained in Part Two. The data are summarised graphically and the

findings provide the framework for assessing the outcome of the thesis, in relation to the goals of the research identified in the introductory chapter.

19.2 The effectiveness of a 'remember' instruction to the CA association

The way a retrieval instruction is phrased affects the reliability and accuracy of the information reported. Encouraging a search for the context, or body of knowledge, in which some specific item of information is located, increases the likelihood of successful retrieval (Lee et al., 1999; Milne & Bull, 1999; Reder, 1987). The effect of instruction on the proportion of accurate responses is displayed in (Figure 19.2.1).

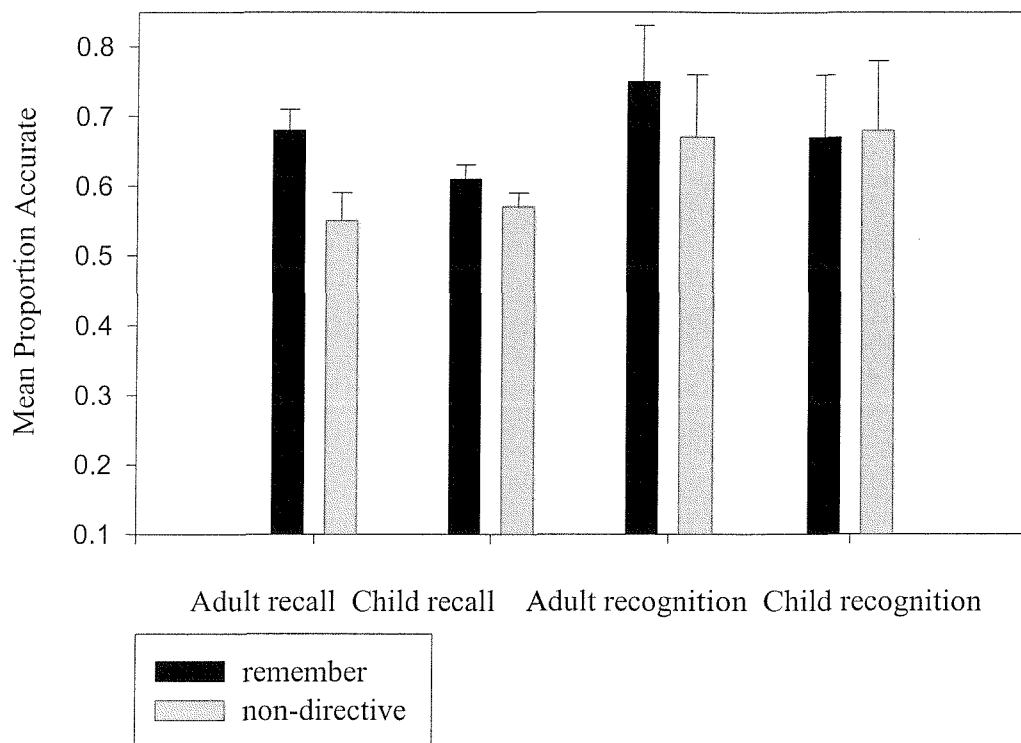


Figure 19.2.1: The effect of instruction on accuracy across test and age, with standard deviation bars.

Figure 19.2.1 demonstrated that the 'remember' instruction, had a considerable

effect on response accuracy in most experiments. This was due to the fact that a 'remember' state of awareness is based on participants' ability to 'call up' information from memory, and to report only their personal experiences (Poole & Lindsay, 1998). The remember instruction improved adult's recall and recognition accuracy and children's recall. Some studies report that children are less accurate in reporting events than adults (Foley & Ratner, 1998; McBrien & Dagenbach, 1998). However, developmental psychologists disagree, and suggest instead that children simply lack the spontaneous use of retrieval strategies (Flavell, 1999). While all age groups benefit from the application of a focussed retrieval instruction, children may benefit more than adults because there is more scope for improvement (Gee & Pipe, 1995; Priestley & Pipe, 1999). With the exception of the experiment on children's recognition accuracy, the data from three experiments conformed to the view that a focussed 'remember' instruction enhances response accuracy. A key finding was the elimination of any developmental difference in recall accuracy across age, with the administration of the 'remember' instruction.

The data in Figure 19.2.1 suggest that the absence of a focussed, guided retrieval instruction could result in a 'don't know' response, a guess, or a distorted memory. The literature reports weak eyewitness CA correlations (Bornstein & Zickafoose, 1999; Perfect et al., 1993). The objective of art Two of the thesis was to increase the strength of the correlation by encouraging a 'remember' state of awareness prior to retrieval. The CA association comprises two distinct components, confidence and accuracy, and the association is likely to be strong when a variable has a similar effect on both components. The CA association is weakened if a variable boosts confidence without an attendant increase in accuracy, leading to overconfidence in ability. Alternatively, witnesses may be under-confident, if accuracy improves without a relative increase in confidence.

Most of the data were consistent with the experimental predictions and theoretical claims that a 'remember' state of awareness increases the criterion for accuracy through efficient memory and source monitoring (Johnson et al., 1993; Johnson, 1997). The conscious awareness of events increases accuracy because of the ability to re-live the experience (Tulving, 1983, 1985). The contradiction in the data occurred for children's recognition. Figure 19.2.1 revealed a higher proportion of accurate responses for children's recognition, than recall. However, the 'remember' and the 'non-directive' instruction led to

an equivalent proportion of accurate recognition responses. This suggests that children may have reached their limit in their ability to accurately report events, so a 'remember' instruction could not improve their performance. There were no interaction effects of instruction and detail in the data across test and age. Hence, the global effect of remembering to recall accuracy transcends age, but there seems to be a developmental difference in recognition accuracy. Memory theorists (Johnson et al., 1993; Tulving, 1985) predict a global improvement in accuracy for all information during a 'remember' retrieval state. The data across the experiments revealed that the 'remember' instruction failed to eliminate the central detail accuracy bias observed in adult recognition (Experiment 3c). However, the remember instruction removed the central detail accuracy bias for children's recall (Experiment 4a).

Confidence

Leippe (1980) suggested that confidence may change after an event, but accuracy is unlikely to change. Thus, the CA association is weakened by over-confidence or under-confidence in ability. Consequently, it is important to ascertain the influence of a 'remember' instruction in assisting witnesses to give a realistic estimation of their ability. Research modelled after the remember/know procedure and the source monitoring framework reveals that confidence is high for remember-based recollections (Hyman et al., 1998; Johnson, 1997; Tulving, 1985). Instead the pattern of data displayed in Figure 19.2.2, on the next page, demonstrated that a 'remember' instruction did not have a consistent effect in increasing confidence in performance, more than the non-directive instruction. Instead, the effect of instruction was sometimes moderated by the type of detail participants reported.

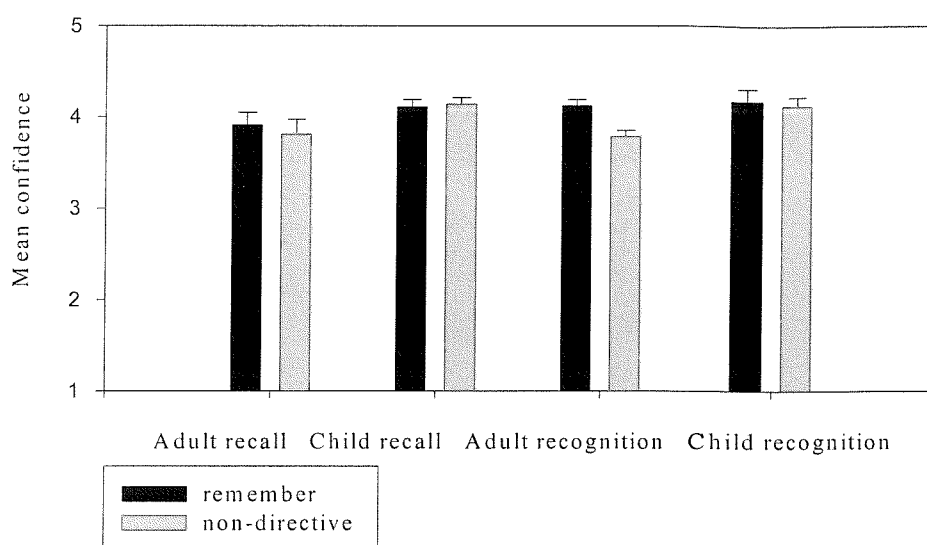


Figure 19.2.2: The effectiveness of the ‘remember’ instruction on confidence across test and age, with standard deviation bars.

The type of content activated in a person’s memory, plays an important role for the realism in confidence judgements (Granhag et al., 1999) The results were consistent with the view expressed by Granhag et al. Adults were more confident when recalling accurate than inaccurate peripheral details when a ‘remember’ than a ‘non-directive’ instruction was administered (Experiment 3a). Children expressed more confidence in their recall of central than peripheral detail answers when given a ‘remember’ instruction (Experiment 4a). Confidence was also higher with the ‘remember’ than the ‘non-directive’ instruction for adult recognition (Experiment 3c), although confidence was equivalent for children’s recognition of answers in the two instruction conditions. Interactions in the data are important because they suggest that the effect of remembering on confidence is moderated by other factors in the cognitive environment, including the type of detail reported.

The confidence-accuracy association

The magnitude of the CA correlation was unaffected by the instruction administered as depicted in Figure 19.2.3 on the next page.

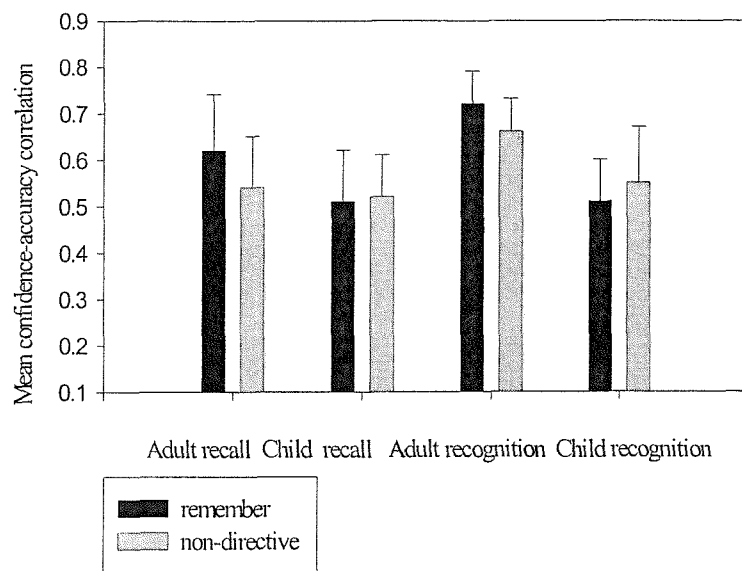


Figure 19.2.3: Effect of instruction on the mean CA correlation with standard deviation bars.

Instead, the CA correlation was consistently higher across all the experiments for central than peripheral details (Figure 19.2.4).

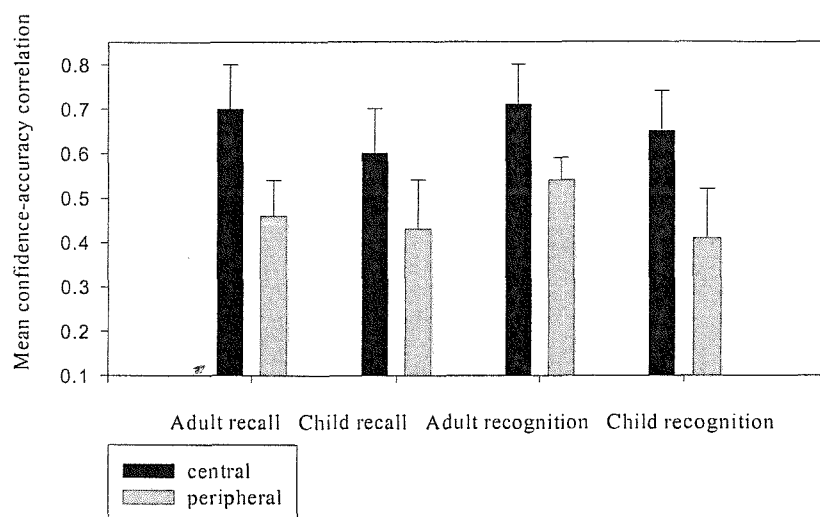


Figure 19.2.4: The effect of detail on the CA correlation across test and age, with standard deviation bars.

There was no effect of retrieval instruction in assisting participants to reliably match confidence and accuracy (see Figure 19.2.3). This result was unsurprising given that confidence and accuracy were higher for central details, than peripheral ones (Experiments 3a, 3c, and 4a). The superiority of central detail memory resulted in better metamemory for these details than peripheral ones (Experiments 3a, 3c, 4a and 4c.). The data were consistent with the explanation outlined in attentional focus theory. Even though the central detail accuracy bias was eliminated for children's recall when the 'remember' instruction was administered (Experiment 4a), their CA correlation responded to the centrality of the event, rather than the 'remember' instruction. Smith et al. (2000) noted the importance of understanding the factors that are detrimental to the CA relationship. A remember state of awareness, when manipulated as an instruction, failed to facilitate CA processing. In contrast, a 'remember' state of awareness more than a 'know' state of awareness accompanied the retrieval of central details recalled by adults (Experiment 1a). Surprisingly, a 'know' state of awareness was associated with an improvement in the CA correlation for peripheral details adults recognised (Experiment 1c). Conversely, the 'remember' state of awareness caused a decrease in the CA correlation for peripheral details. The state of awareness was unrelated to the magnitude of the CA correlations when children recalled their answers (Experiment 2a). In contrast, children's CA resolution for central details recognised improved during a 'remember' retrieval state (Experiment 2c).

Taken together, the evidence relating to the effectiveness of 'remembering' to the strength of the CA correlation, appears to be dependent upon how 'remembering' is manipulated. When it was operationalized as a state of awareness instruction, it was not effective in strengthening the CA correlation. Robinson and Johnson (1998) reported that introspective techniques, including mental context reinstatement, were detrimental to the CA relationship when participants were engaged in a suspect identification task. Participants in Robinson and Johnson's study were better able to match confidence and accuracy when the faces of suspects 'popped' out at them from a line-up, than when they were asked to engage in introspection.

The idea that memory monitoring is dynamic, involving informational and affective judgements is not novel (Pressley, Forest-Pressley, Elliot-Faust & Miller, 1985; Koriat & Levy-Sadot, 1999). However, the experiments reported in this thesis demonstrated exactly

how this memory monitoring process might occur. Specifically, the data from the thesis illustrated how the state of awareness accompanying retrieval, or prior to retrieval, affects the efficiency of memory monitoring. A novelty of the thesis was the examination of the state of awareness underlying FOK predictive accuracy and the FOK-CA association. In some respects the memory monitoring underlying confidence-accuracy judgements and feeling of knowing (FOK) judgements were more similar than dissimilar, because they were influenced by detail type and retrieval state. Efficient memory monitoring is also necessary to differentiate a lack of knowledge from a feeling of knowing. The influence of instruction and detail on 'do not know' and FOK responses are discussed in the next section.

19.3 'Do not know' responses

The provision of a 'don't know' option increases response accuracy (Memon et al., 1996; Pozzulo & Lindsay, 1997; Quas et al., 1999) and the mean number of 'do not know' responses for Experiments 3a, 3c, 4a, and 4c are summarised by instruction and detail in Table 19.1.4. An overview of the data revealed more 'do not know' responses for peripheral detail questions, and this was consistent with central detail accuracy bias observed in Experiments 3a, 3c and 4a. The 'remember' pre-test instruction perhaps made participants more conservative in responding to questions because they were directed to report only what they 'remember seeing and hearing' of the witnessed event. Consequently, what a witness reported was more likely to be accurately and confidently expressed (Koriat & Goldsmith, 1996). The choice of the pre-test retrieval instructions administered to witnesses and the response options available, affect the reliability of the reports. Children, in particular, must be given the option to admit that they cannot answer a question. They must also be informed that they can correct the interviewer if misleading or distorted information is provided (Roberts & Lamb, 1999).

Table 19.3.1: *Mean frequency of 'do not know' responses and (standard deviation scores) across detail, test, and participants.*

	Central Details (n=15)		Peripheral Details (n=15)	
	Non-directive	Remember	Non-directive	Remember
Adult recall	.93 (.19)	1.33 (.22)	3.42 (.39)	4.00 (.47)
Adult recognition	.19 (.54)	1.20 (1.30)	.77 (1.80)	3.60 (2.77)
Child recall	.27 (.46)	1.35 (2.79)	.82 (1.33)	.83 (1.34)
Child recognition	.25 (.76)	.59 (1.85)	.79 (1.41)	.66 (1.40)

19.4 Remembering and Feeling of knowing (FOK) predictive accuracy

A feeling of knowing indicates that knowledge that cannot be spontaneously recalled, is nevertheless available, and it can be subsequently recognised. The reliability of this predictive accuracy has been measured in a variety of contexts; for example, judgments of learning (Son & Metcalfe, 2000) and predictive accuracy for general knowledge information (Bornstein & Zickafoose, 1999). The consensus in the literature is that FOK accuracy may be well above chance but performance is less than perfect (Leonesio & Nelson, 1990). Specifically, FOK for eyewitness memory is unreliable (Perfect & Hollins, 1999). Feeling of knowing judgements, like confidence-accuracy decisions, represent memory monitoring for the availability and certainty of knowledge. The difference between a CA and a FOK judgement is that the latter reflect the monitoring of prospective memory, while the former relies on retrospective monitoring.

One of the questions examined in the thesis was whether FOK's are initiated by the strength of the memory trace, operationalised as a central/peripheral detail differential. The results from Experiment 3b revealed that neither instruction nor detail influenced the proportion of FOK judgements, predictive accuracy, confidence or the FOK-CA association, with adult participants. Adults recalled central and peripheral details equally well (Experiment 3a), so this may explain why there was no effect of detail on all three measures of FOK performance. Children recalled central details more accurately than peripheral ones (Experiment 4a), so it was unsurprising that predictive accuracy was higher for peripheral than central details recognised (Experiment 4b). There was more room for

improving memory for peripheral details with the additional cues present in the alternative answers on the recognition test. There was no effect of instruction on the FOK-CA association, although a significant correlation was obtained for peripheral details recognised when the 'remember' pre-test instruction was administered to children (Experiment 4b).

In Part One of the thesis predictive accuracy for central details adults recognised was accompanied by a 'know' than a 'remember' state of awareness (Experiment 1b). Children's FOK judgements were greater for unanswered central detail questions, than peripheral detail ones. Children's predictive accuracy for peripheral details was accompanied by a 'know' retrieval state (Experiment 2b). The data from Experiments 1b and 2b accord with the view that FOK experiences are based on a sense of familiarity (Lories et al., 1998).

Previous eyewitness FOK research (eg., Perfect & Hollins, 1996; 1999) found that predictive accuracy was unreliable. Perfect and colleagues called for more research to determine if eyewitness FOK judgements are always unreliable, and if not, under what conditions could reliable judgements be expected. The experiments reported the thesis responded to this call for research to examine the reliability of eyewitness FOK experiences. More importantly, the FOK experiments complemented the study of memory monitoring evaluated for recollective memory, which was measured as the confidence-accuracy association. Predictive accuracy was above chance performance, .25, in all the experiments (see Figure 19.4.1 on the next page). Moreover, the data relating to children's eyewitness FOK performance is, to date, a specific contribution of this thesis to the literature. Further research is needed to examine the generalizability of the results reported in this thesis. No clear conclusions can be drawn across the series of experiments. However, the data are valuable because they provide an insight into the role of detail and retrieval state in initiating FOK judgements, and assisting recognition memory.

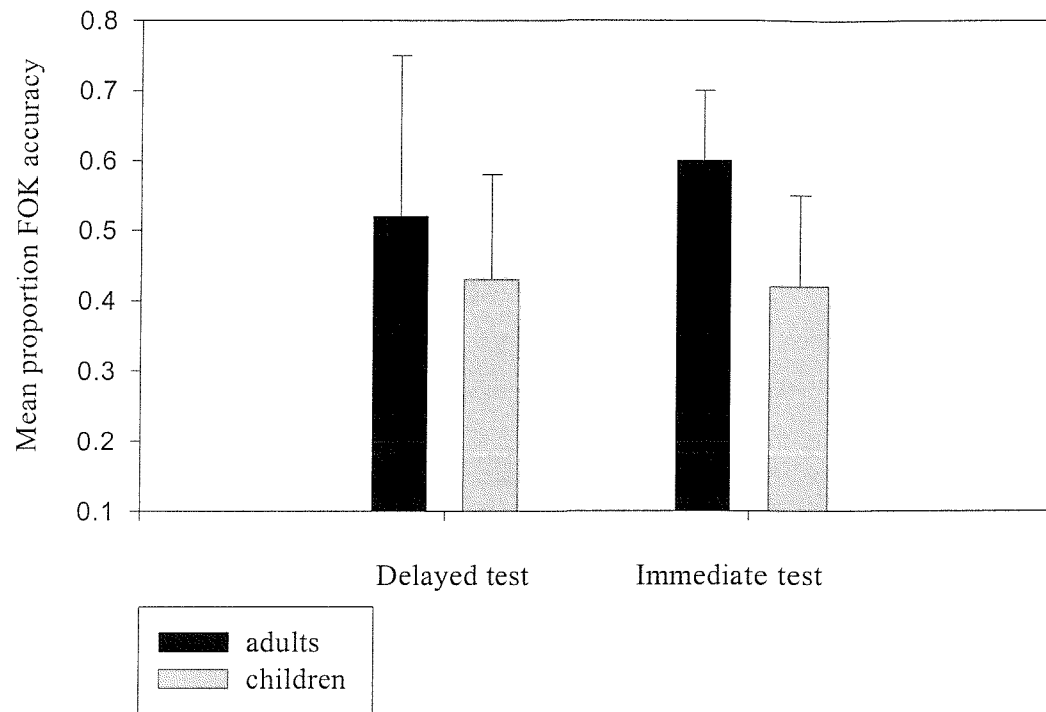


Figure 19.4.1: Predictive accuracy (chance performance is .25), across age and test, with standard deviation bars.

19.5.Limitations of the research

The structure of the thesis into two parts in which the experimental conditions were not identical, may raise some methodological concern. Part One examined the contributions of 'remember'/'know' *judgements* to accuracy and the CA association on a source monitoring task, after a 24 hour delay. Part Two manipulated the state of awareness prior to retrieval though the use of a 'remember' versus a 'non-directive' instruction. An immediate memory test was administered without a source monitoring task. The important point is that the two parts of the thesis were inter-related because the research issues remained the same. Part Two applied the results obtained in Part One in a forensically relevant way through the use of a 'remember' instruction when questioning eyewitnesses. Despite these differences, the similarity in the research design produced consistent patterns

in the data in Parts One and Two. The limitations of the research pertained to the choice of stimuli and these are outlined in this section.

First, the stimuli used in the experiments were non-threatening and did not invoke a sense of trauma or embarrassment. Research with victims of sexual abuse, particularly children, indicates that special interviewing techniques are needed that would encourage disclosure without encouraging false memories. Consequently, the effectiveness of a 'remember' retrieval state or a 'remember' pre-questioning instruction may not have the same benefits in reporting emotional events. Emotional arousal can result in a focussing of attention to the central, details of an event (Christianson et al., 1991; Loftus et al., 1987). This results in a concurrent impairment in memory for peripheral details which are likely to contain illusions. Croft (1995) found that the cognitive interview, which emphasises mental context reinstatement, was inappropriate for interviewing traumatised victims.

Second, the focus of the thesis was on the reporting of the central and peripheral details of an event, rather than on descriptions of persons shown in the video-taped event. Research indicates that memory for some types of personal attributes of a suspect, such as clothing, ethnicity, eye colour and hairstyle, produced reliable CA correlations. However, estimations of the suspect's age, weight and height were associated with weak CA judgements (Ebbensen & Rienick, 1998). In contrast, introspective strategies and mental context reinstatement weakened CA resolution for suspect identification (Robinson & Johnson, 1998). The extent to which states of awareness can facilitate memory for personal identifying attributes warrants further research, because these are the primary sources of information used by the police in their search for, and arrest of, suspects.

Third, there may be limitations in generalizing the findings from experimental studies, in which variables are controlled, to the courtroom in which events are less controlled. 'Real-world' variables that affect witness accuracy and confidence include lengthy delays before an incident is reported, repeated interviews, and the viewing of violent events. These variables may affect a witness's ability to provide a reliable CA judgement. Research based on forensically realistic variables, reveals a mixed pattern of results. For example, there is no substantial difference in confidence when adults view violent versus non-violent events (Granhag, 1997). However, children are more accurate in reporting the details of a theft, compared to a neutral event (Ochsner et al., 1999).

Interestingly, knowledge that an event was staged does not affect accuracy, but it influences the confidence-accuracy relationship (Murray & Wells, 1982). A 24-hour retention interval was used in Part One of the thesis, but testimony may be assessed after weeks or months. Schmolck, Buffalo and Squire (2000) evaluated the memories of students to information pertaining to the O. J. Simson murder trial 3 days, 15 and 32 months after the trial. Their results showed how memory distortions occurred after extensive delays, with meta-memory and source errors associated with inaccurate recollections. After 15 months, 50 percent of the reports were highly accurate and 11 percent of the recollections contained major errors and distortions. There was a deterioration in accuracy levels after 32 months; 29 percent of memories proved to be accurate and 40 percent of the information contained distortions.

The accuracy and consistency of information over repeated testing has been extensively investigated (e.g., Parker, 1995; Poole & White, 1995), but what is less well known is the stability of the CA association over repeated interviews. Repeated testing affects confidence in the accuracy of memory (Granhag, 1997); therefore, it is expected to influence CA resolution.

Finally, the results from naturalistic studies often challenge experimental findings. Research indicates that children's testimony is less accurate and reliable than adults (e.g., Bruck et al., 1998; Bruck & Ceci, 1999). However, case studies show a high level of accuracy in children's allegations of sexual abuse with more omission errors, leaving out information that did occur, than commission errors, including details that did not occur (Bidrose & Goodman, 2000). Unfortunately, the difficulty and ethical problems in obtaining cases-studies of children's sexual abuse, lead to a reliance on data derived from simulated events. Laboratory events are artificially controlled and the findings need to be interpreted with caution. However, one advantage of laboratory studies is the ability to impose controls on the conditions at testing. This is particularly relevant for research into eyewitness memory. Although there is no control over what witnesses attend to and encode, the conditions at retrieval can be controlled to optimised accuracy.

19.6 New directions for research

It has recently been suggested that although memory research currently emphasises the conditions that facilitate correct memory, and those that are detrimental to response

accuracy, it is increasingly necessary to investigate how similar conditions are related to commission errors (Seamon et al., 2000). Commission errors include reporting information that was not previously presented, memory intrusions, resulting in false recall and false recognition. With this in mind, future research is needed on the role of state of awareness in preventing commission errors and false recognition, as well as the phenomenological experiences underlying memory intrusions, commission errors and false recognition.¹ A developmental approach is also necessary to understand whether children are susceptible to the same memory errors as adults, and if so, to what extent. More importantly, a developmental approach would identify the cognitive conditions that facilitate memory and metamemory, regardless of the age of a participant.

The consensus in the thesis was that remember-based recollections were more accurate than information that was 'known'. Further research is needed into how juror perceptions of witness confidence are affected by statements in which a witness claims 'I know what the thief stole' versus another witness who claims 'I remember seeing what the thief stole'. The use of powerless words (e.g. 'I believe') and verbal hedges (e.g. hum...) when testifying, reduces the credibility of witnesses (Schooler, Clark & Loftus, 1988). It stands to reason that jurors may attach different weights to statements a witness claims to 'know' versus those he or she 'remembers'. This warrants further investigation.

There is growing debate regarding when confidence measures should be obtained. At present the experimental designs used to evaluate CA resolution (e.g. Perfect & Hollins, 1996; 1999), request a confidence rating for each answered question on the memory test. This procedure was adopted in the thesis. Yet, in practice the legal system does not require witnesses to indicate their certainty for each item of information reported. Instead a global measure of the reliability of the evidence may be taken after witnesses are interviewed. Few empirical studies use a global measure of confidence. There is some indication that people overestimate their performance when they are asked to give item-specific assessments (Granhag, 1997; McCauley & Fisher, 1995). In contrast, a frequency judgement in which an overall impression of the number of correct answers is given, leads

¹ This was a comment made by Dan Wright who reviewed the submitted article by Seemungal et al. "Using states of awareness to facilitate eyewitness memory."

to an underestimation of performance. It appears that the strength of the CA association may be an artifact of the experimental design; that is, when and how the confidence rating is measured. More research is needed to determine the strength of the CA when global versus item-specific confidence measures are obtained.

In Part One of the thesis a Latin Square was used in the six experiments to counterbalance when the source, confidence and remember/know decisions were measured. Unfortunately, there were insufficient cases to fully explore if a differential in accuracy occurred because of the position of the confidence or source decision. However, it remains a theoretically important issue for future research because the *sequence* of the judgements can affect the accuracy of recollections (Mather, Henkel & Johnson, 1997). Hicks and Marsh (1999) argued that source-monitoring judgements are more stringent than 'remember'/'know' judgements and these source-decisions reduce memory biases. Obtaining a source decision first, and then a remember/know judgement, may impose a stricter measure of accuracy than requesting the remember/know judgement followed by a source decision.

The focus of the thesis on the contributions of remember/know judgements to response and the confidence-accuracy relationship ignored the possibility that individual difference variables can determine the phenomenological experiences underlying accurate and inaccurate responses as well as source monitoring efficiency. Age differences were discussed with respect to adults and children, but the SMF claims that people who are vivid imagers are more likely to make source monitoring errors than those who are not vivid imagers (Johnson et al., 1993). However, it is less important whether future research investigates the cognitive or individual differences underlying memory and meta-memory; it is more important to continue to investigate the cues that differentiate true from false memory (Pickel, 1999) and to identify the optimal meta-cognitive conditions essential for reliable CA resolution (Smith et al., 2000).

19.7 Conclusion: Significance of the thesis

The purpose of the thesis was to examine the reliability of the CA association for eyewitness memory which is reported to be weak (e.g. Perfect & Hollins, 1996). Evidence

that a 'remember' state of awareness at retrieval (Tulving, 1985) improves accuracy and confidence in word recall and autobiographical memory was applied to enhance the magnitude of the eyewitness CA correlation. The thesis was divided into two inter-related parts and twelve experiments were conducted in which CA resolution was examined under various conditions with adults and children. The main prediction throughout the experiments in the thesis was based on the Source Monitoring Framework (SMF), which is outlined by Johnson and colleagues (e.g., Johnson et al., 1993). The SMF predicts that efficient source and memory monitoring would lead to greater accuracy and confidence. This efficient memory and source monitoring occurs during a 'remember' state of awareness. These premises outlined in the SMF were used to make predictions for the CA association.

Meta-memory efficiency is determined by the success of retrieval strategies (Forgeau, Aubin, Bouyx & LeGall, 1999). These strategies include a 'remember' retrieval state and a 'remember' retrieval instruction. Instead of a consistent advantage of a 'remember' mental state to memory and meta-memory efficiency, several interaction patterns in the data were observed. These served to clarify the conditions under which remembering would facilitate CA and FOK monitoring. The way in which participants used their knowledge about how information was retrieved, as well as the type of detail reported, to give accurate answers and reliable confidence ratings, changed according to the demands of the task. As a result, differences in the data emerged across test, rather than age. The way in which participants responded to the demands of the task provided an insight into the 'on-line' decisions in which eyewitnesses are engaged when they are describing their experiences. In some experiments the conditions that enhanced accuracy had a non-significant or a partial effect on confidence which weakened the CA association. Several theorists suggest that accuracy and confidence function as independent constructs (Leippe, 1980; Luus & Wells, 1994; Smith et al., 1989) and the data were consistent with this view.

The state of awareness accompanying retrieval had a selective effect on the reliability of the CA decisions in Part One of the thesis when a delayed test was used. In Part Two of the thesis, detail, rather than the pre-test instruction, was the greater determinant of CA reliability. In most of the studies reported in the thesis the CA correlations were significantly different from zero, evidence that eyewitness memory

monitoring measured as the CA correlation (e.g. Perfect & Hollins, 1996) or FOK recognition accuracy (Perfect & Hollins, 1999) was not as unreliable as it is generally believed to be. Consequently, the present data challenge claims that the CA relationship is weak under laboratory conditions and probably functionally useless in courtroom settings (Fife-Schaw, 1999).

Memory and the strength of the CA relationship was evaluated for the central and peripheral details of an eye-witnessed event. This was important because investigating police officers and the courts rely on an accurate account for all details of a crime or observed event. Additionally, the controlled artificial nature of some psychological experiments can reduce the realism and the variation in the data needed to produce statistically significant CA correlations (Gruneberg & Sykes, 1993; Kebbell et al., 1996; Olsson & Juslin, in press; Lindsay, Read & Sharma, 1998; Read, Lindsay & Nicholls, 1998). As a result, varying the stimuli material along a central/peripheral detail differential, led to more reliable CA resolution for central than peripheral details.

The CA association was measured in the thesis by computing a gamma correlation. This is a within-subjects measure which allows the identification of reliable witnesses; that is, those persons who were more confident when they accurately reported events than when they were inaccurate. A within-subject analysis provides a better understanding of the characteristics, memorial and non-memorial, which are likely to lead to reliable answers in a particular population. Additionally, Sykes et al., (1988) claim that an explanation of the CA association must illustrate the extent to which, at different ages reliable CA associations occur, the types of materials that lead to these associations and the degree to which they are consistent over time and situations. This was achieved in the series of experiments presented in the thesis which varied by retrieval state, detail, test format and the age of the participant. There was consistent evidence that CA processing after a 24 hour retention interval was partially facilitated by retrieval state and detail strength, ie. central details. In contrast, CA processing on the immediate test was strongly based on trace strength alone. These results were consistent with fuzzy-trace theory, attentional focus theories, as well as the source monitoring framework. These theories predict better memory for the central, salient details of an event, with schematic errors and source mis-attributions for peripheral detail memory. A key finding in the thesis was that a central detail accuracy bias in

memory, led to a central detail accuracy bias in meta-memory. This was manifested in high CA correlations for central details.

In general, and across the series of experiments, children 8-11 years did not perform worse than adults. Some theorists believe that children rely more on focussed, guided retrieval instructions than adults, because they do not spontaneously generate these retrieval strategies (Ghatala et al., 1986; Pressley et al., 1984). The data from the thesis suggest that children are capable of identifying their retrieval state, the source of their memories, and they were able to regulate their responses to include only what they 'remembered seeing or hearing'. Thus, when instructed to do so, children can organise information and learn what questions to ask themselves before retrieving and providing responses. This use of a conscious, retrieval strategy is a 'higher order mental function' (Paris, Newman & Jacobs, 1985) and it demonstrates the advantage of motivating participants to control their performance (Pierce & Lange, 2000).

In summary, the results of the thesis were compatible with the theories outlined in Part One. Cowan (1998) claimed one must evaluate which assumptions of a model can account for its success, and which other assumptions may be counterproductive. The remember/know model and the source monitoring framework predict global improvements in memory with a 'remember' retrieval state. Memory theorists believe that successful retrieval is heavily dependent on context, the setting in which memory for some specific item of information is located (e.g., Schooler & Anderson, 1997; Morris & Gruneberg, 1994). The act of remembering engages deliberate and conscious imagery which leads to an enhancement of memory by accessing the contextual material (e.g., Foley et al., 1993). However, the data from this thesis indicated that the effectiveness of a 'remember' state of awareness in strengthening the CA correlation, was often moderated by the type of detail reported (e.g., Experiment 1a). In other experiments in the thesis, a remember-based pre-test instruction failed to eliminate the central detail accuracy bias (e.g., Experiment 3c). Overall, the results illustrated the moderating effects that occur when the test format, retention interval, and age of the witness are varied. A common limitation identified in the extant research on the eyewitness confidence-accuracy relationship, feeling of knowing memory, and the reliability of child witnesses, is that the research tends to be descriptive without addressing methods for improvement (Koriat, 1993; Saywitz, 1995). It is hoped

that the results of this thesis can partially redress this limitation in the literature, by illustrating the conditions under which ‘remembering’ can be expected to improve, impair, or moderate the effect of detail type, in regulating eyewitness accuracy.

APPENDIX

Appendix 1

Stimulus material for the experiments described in Part One of the thesis

AUDIO TRANSCRIPT - Irrelevant information

It was 2 pm in the afternoon on a hot, sunny day. Four children, two boys and two girls, wanted to have some fun. They decided to go to the park to play football. They took their ball, left their white painted house and walked down the quite, country lane outside their home. On the way to the park the children passed a house with a large garden. At the bottom of the garden was a river with cool, clear running water. The children looked around but no one appeared to be at home. They climbed over a green gate and entered the garden. The eldest child was 13 years and he wore a blue football cap. He told the other children 'come on let's play football'. The children played excitedly for one hour. While they were playing in the garden a red car drove passed the house in the country lane. The children looked at the car apprehensively because they thought that the owners of the house had returned home. The children continued playing when the car drove past the house. Half an hour later the children hear a shout and they were confronted by a farmer wearing blue overall who said 'You there! Get out of the garden!' The farmer told the children they the house belonged to his neighbours and they were on vacation. The children apologised to the farmer for trespassing and he invited them to visit his farm on which he kept goats and kids, baby goats. The children stayed on the farm until they returned home at 5 pm.

AUDIO TRANSCRIPT - Relevant additional information (from the middle and the end of the film clip).

A man the hero and a woman jumped from the roof of a house onto the cobbled pavement below. They were being perused by a man with a gun in his hand who was running quickly towards them. The chase continued along a cobbled street and passed a bridge. Next to the bridge was a grey painted church. The hero and the woman ran into a market. There were a lot of people shopping on a Saturday morning. Above the streets in the market place hung colourful, fabric banners. The woman became tired and she began to walk with a limp. The woman was no longer able to escape and the hero told her to hide in a stall in the market.

The hero met a police Captain in the market and he took his bicycle and a pair of handcuffs. The hero was able to escape from the men who were chasing him by riding away on a blue bicycle. The seat of the cycle fell off, but the hero did not stop. The pursuers chased the hero down the narrow streets of the market. In one of the streets the hero saw a man on a ladder with a bucket in his hand. The man was washing the windows of his shop and he was almost knocked over by the cyclists. He told the chasers, 'This is no place for a race!' The hero tried to escape from the chasers by flicking a bowl of water with the wheel of his bicycle onto the faces of the chasers. The chasers were temporarily blinded by the spray of water. The hero also knocked a box of fruits and vegetables onto the street in the path of the chasers. The hero successfully escaped from this pursuers after a chase lasting 30 minutes.

The video event - TRANSCRIPT of VIDEO EVENT (middle of the film)

Three men on bicycles chased the hero and the woman through the market place. The men wore black suits and hats. The hero was wearing a white shirt and beige pants. His female companion was wearing a white blouse and a blue shirt. She also wore a straw colour hat with a blue ribbon. The hero tried to elude his pursuers in a series of clever ways. On one occasion he told the woman to 'Take your clothes off!' The woman was offended and said 'I can't do that!' before slapping the hero across his cheek. The hero dressed a doll in the woman's clothes and continued his escape through the market place. While running he knocked over a police Captain. The Captain arrested the hero, with a pair of black handcuffs, for deserting the police force. The hero managed to escape from the handcuffs, and rode away on a bicycle. The Captain blew his whistle in to alert his 6 policemen that the hero had escaped. The Captain's policemen waved their truncheons to stop the hero from escaping. The policemen wore straw-coloured hats, blue uniforms and white socks. They then tried to chase the hero on their blue bicycles.

Appendix 2

Questions based on the Video event (middle of the film clip)

Central detail questions

1. What were the chasers wearing?
2. What was the colour of the hero's shirt?
3. What was the colour of the hero's trousers?
4. What did the woman tell the hero before she slapped him?
5. How many men on bicycles pursued the hero and the woman?
6. What was the colour of the woman's hat?
7. What was the colour of the woman's skirt?
8. What was the colour of the woman's blouse?

Peripheral detail questions

1. How many of the Captain's policemen were present?
2. What did the Captain's policemen wave at the hero?
3. Who blew their whistles at the hero?
4. What colour was the pair of handcuffs?
5. What was the colour of the Captain's policemen's uniforms?
6. What was the colour of the Captain's policemen's socks?
7. What was the colour of the Captain's policemen's hats?
8. What was the colour of the Captain's policemen's bicycles?

Questions based on the Additional Information (beginning and end of the film clip)

Central details

1. From where did the man, the hero, jump?
2. How many men on foot chased the hero and the woman?
3. What did the hero take from the police Captain?

4. How many of the chasers had weapons?
5. What colour was the bicycle the hero was riding?
6. Where did the woman hide?
7. What fell off the bicycle the hero was riding?

Peripheral details

1. Where was the church located?
2. What was hanging over the streets in the market place?
3. What did the man on the ladder say to the chasers?
4. What did the man on the ladder have in his hand?
5. What was in the bowl on the ground that the hero flicked at the men who were chasing him?
6. What was spilt onto the streets in the path of the chasers?
7. How long did the chase last?

Questions based on the irrelevant information

Central detail questions

1. What game was the children playing?
2. How many boys were playing?
3. How many girls were playing?
4. How old was the eldest child?
5. Where did the children go immediately after playing?
6. At what time did the children return home?
7. Where were the children playing their game?

Peripheral detail questions

1. Where was the children's house located?

2. Where was the river located?
3. What type of vehicle drove by the house while the children were playing?
4. What was the colour of the vehicle?
5. What kind of animals did the children see?
6. Who spoke to the children while they were playing?
7. Where were the owners of the house?

Appendix 3

List of central and peripheral detail questions presented in the video event shown in Part Two of the thesis.

CENTRAL DETAILS

1. From where did the hero and the woman jump at the beginning of the film?
2. How many men (bicycles and on foot) chased the hero and the woman?
3. How many of the chasers had weapons?
4. How many men on bicycles chased the hero and the woman?
5. Where did the woman hide half-way through the film?
6. What did the hero tell the woman before she slapped him?
7. What did the hero take from the police Captain?
8. What was the colour of the hero's shirt?
9. What was the colour of the hero's trousers?
10. What colour was the bicycle the hero was riding?
11. What fell of the bicycle the hero was riding?
12. What was colour of the woman's hat?
13. What was the colour of the woman's skirt?
14. What was the colour of the woman's blouse?
15. What were the chasers wearing?

PERIPHERAL DETAILS

1. Where was the church located?
2. What was hanging over the streets in the market place?
3. What did the man on the ladder say to the chasers?
4. What did the man on the ladder have in his hand?
5. How many of the Captain's policemen were present?
6. What did the Captain's policemen wave at the hero?
7. Who blew their whistles at the hero?

8. What was in the bowl on the ground that the hero flicked at the men who were chasing him?
9. At the end of the film what was spilt on the street?
10. How long did the chase last?
11. What colour was the pair of handcuffs?
12. What was the colour of the policemen's uniform?
13. What was the colour of the policemen's socks?
14. What was the colour of the policemen's hats?
15. What was the colour of the policemen's bicycles?

C) Finally, if you answered the question, I want you to tell me was the answer in the **VIDEO or AUDIOTAPE?** Circle one of the words.

If you were unable to provide an answer to the question, please tell me if this was because:

- (A) You don't know the answer.
- (B) You feel you could recognize the answer if you saw it.

Remember it is important not to discuss the questions with your colleagues, but to tell me what YOU remember. Do not GUESS, but be honest in giving your answers.

Thank you very much for your assistance.

Question 1 : From where did the man (the hero) and the woman jump?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer.
- (B) You feel you could recognize the answer if you saw it .

Now try to answer question 2.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 2 : How many men on bicycles pursued the hero and the woman?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 3.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?

- (B) Was the answer in the VIDEO or AUDIOTAPE?

- (C) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

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Question 3 : Where was the church ?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it

Now try to answer question 4.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?

- (B) Was the answer in the VIDEO or AUDIOTAPE?

- (C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

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Question 4 : How many of the chasers had weapons?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 5.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 5 : How many men, on foot, chased the hero and the woman?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 6.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 6 : Where did the woman hide ?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 7.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 7 : What did the hero tell the woman before she slapped him?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 8.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 8 : What was hanging over the streets in the market place?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 9.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 9 : What did the man on the ladder say to the chasers?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 10.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 10 : What did the man on the ladder have in his hand?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 11.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 11 : What did the man (the hero) take from the police Captain?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 12.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 12 : How many of the Captain's policemen were present

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 13.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

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Question 13 : What did the Captain's policemen wave at the hero?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 14.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A). Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

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Question 14 : Who blew their whistles at the hero?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 15.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 15 : What was in the bowl on the ground that the hero flicked at the men who were chasing him?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 16.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 17 : How long did the chase last?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 18.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 18 : What was the color of the hero's shirt?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 19.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 19 : What was the color of the hero's trousers?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 20.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?

- (B) Was the answer in the VIDEO or AUDIOTAPE?

- (C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

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Question 20 : What color was the bicycle the hero was riding?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 21.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A)Did you **REMEMBER** or **KNOW** the answer?

- (B) Was the answer in the VIDEO or AUDIOTAPE?

- (C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 21 : What fell off the bicycle the hero was riding?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 22.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?

- (B) Was the answer in the VIDEO or AUDIOTAPE?

- (C) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

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Question 22 : What was the color of the woman's hat?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 23.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?

- (B) Was the answer in the VIDEO or AUDIOTAPE?

- (C) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

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Question 23 : What was the color of the woman's skirt?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 24.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

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Question 24 : What was the color of the woman's blouse?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 24.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

Question 25 : What were the chasers wearing?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 26.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

Question 26 : What color was the pair of handcuffs?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 27.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

Question 27 : What was the color of the Captain's policemen's uniform?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 28.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

Question 28 : What was the color of the Captain's policemen's socks?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 29.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Question 29 : What was the color of the Captain's policemen's hats?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 30.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

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Question 30 : What was the color of the Captain's policemen's bicycles?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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Thank you for completing Part One of the test. Seal this questionnaire in Envelope Number 1, and then open the second envelope with questionnaire. After completing the second questionnaire, please seal it in the envelope provided.

Appendix 5

Questionnaire Experiments 1b and 1c -recognition questionnaire- video plus additional information- remember/know, source and confidence judgements

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

One the previous questionnaire you indicated that for you would recognize some of the answers to the questions. Once again I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. **Please follow the instructions carefully and give a response for ALL questions.**

Question 1 : From where did the man (the hero) and the woman jump?

- (A) A flight of stairs
- (B) A bridge
- (C) Tree top
- (D) Roof top

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1

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Question 2 : How many men on bicycles pursued the hero and the woman?

- (A) Three
- (B) Four
- (C) Five
- (D) Six

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 3 : Where was the church located ?

- (A) Near to the bridge
- (B) In the market
- (C) In the narrow streets
- (D) In the park

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 4 : How many of the chasers had weapons?

- (A) One
- (B) Two
- (C) Three
- (D) Four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1

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Question 5 : How many men on foot chased the hero and the woman?

(A) Two

(B) Three

(C) Four

(D) Five

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

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Question 6 : Where did the woman hide ?

(A) In a house

(B) In a market stall

(C) Under a bridge

(D) In a church

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 7 : What did the hero tell the woman before she slapped him?

- (A) Jump
- (B) Can't you do anything
- (C) Take all your clothes off!
- (D) I will give you to the mobsters!

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 8 : What was hanging over the streets in the market place?

- (A) Baskets
- (B) Flower pots
- (C) Vegetables
- (D) Fabric banners

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 9 (a): What did the man on the ladder say to the chasers?

- (A) You are in trouble!
(B) This is no place for a race!
(C) Go that way!
(D) Have you seen a girl?

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
(B) Was the answer in the **VIDEO/AUDIOTAPE**.
(C) How confident are you that your answer is correct.

Not confident

Very Confidential

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Question 10 : What did the man on the ladder have in his hand?

- (A) Some fruit
(B) A fabric banner
(C) A bucket
(D) Some wood

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

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Question 11 (a): What did the man (the hero) take from the police Captain?

- (A) Handcuffs and a bicycle
(B) A gun
(C) A truncheon
(D) A hat

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 12 : How many of the Captain's policemen were present?

- (A) One
- (B)Two
- (C) Three
- (D) More than four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 13 : What did the Captain's policemen wave at the hero?

- (A) Truncheons
- (B) Hats
- (C)Guns
- (D) Handcuffs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the VIDEO/AUDIOTAPE.

(C) How confident are you that your answer is correct.

Not confident

Very Confidential

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Question 14 : Who blew their whistles at the hero?

(A) The chasers

(B) The market sellers

(C) Residents in the street

(D) Policemen

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the VIDEO/AUDIOTAPE.

(C) How confident are you that your answer is correct.

Not confident

Very Confidential

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Question 15 : What was in the bowl on the ground that the hero flicked at the men who were chasing him?

(A) Dust

(B) Fruits

(C) Oil

(D) Water

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the VIDEO/AUDIOTAPE.

(C) How confident are you that your answer is correct.

Not confident

Very Confidential

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Question 16 : What was spilt on the street in the path of the chasers?

- (A) Vegetables
(B) Clothes
(C) Hats
(D) Chairs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the VIDEO/AUDIOTAPE.

(C) How confident are you that your answer is correct.

Not confident

Very Confidential

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Question 17 : How long did the chase last?

- (A) 1 minute
(B) Thirty minutes
(C) Six minutes
(D) Eight minutes

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the VIDEO/AUDIOTAPE.

(C) How confident are you that your answer is correct.

Not confident**Very Confident**

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Question 18 : What was the colour of the hero's shirt?

- (A) Black
- (B) White
- (C) Brown
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident**Very Confident**

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Question 19 : What was the colour of the hero's trousers?

- (A) Beige
- (B) White
- (C) Blue
- (D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident**Very Confident**

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Question 20 : What colour was the bicycle the hero was riding?

- (A) Red
- (B) Black
- (C) Silver
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 21 : What fell off the bicycle the hero was riding?

- (A) The bell
- (B) The wheel
- (C) The seat
- (D) A bag of fruit

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 22 (a): What was the color of the woman's hat?

- (A) Brown
- (B) Blue
- (C) Silver
- (D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

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Question 23 : What was the colour of the woman's skirt?

(A) Red

(B) Brown

(C) Black

(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

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Question 24 : What was the colour of the woman's blouse?

(A) White

(B) Brown

(C) Blue

(D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

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Question 25 : What were the chasers wearing?

(A) Suits

(B) Tee shirts and shorts

(C) Tee shirts and jeans

(D) Uniforms

Question 26 (a): What colour was the pair of handcuffs?

(A) Silver

(B) Gold

(C) Blue

(D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

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Question 27 (a): What was the colour of the Captain's policemen's uniform?

(A) White

(B) Green

(C) Red

(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 28 : What was the colour of the Captain's policemen's socks?

- (A) Brown
- (B) Blue
- (C) Black
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 29 : What was the colour of the Captain's policemen's hats?

- (A) Brown
- (B) White
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

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Question 30 : What was the colour of the Captain's policemen's bicycles?

(A) Silver

(B) Red

(C) Blue

(D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

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Thank you for your help.

Appendix 6

Experiment 1a-cued free recall questionnaire- video plus additional information- source, confidence and remember/know judgements

GR 2/Add recall

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

Thank you for agreeing to participate in this study. I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. Please follow the instructions carefully.

State your age in the space provided

AGE

.....

Tick one of the following
Female

() Male

()

Question 1 : From where did the man (the hero) and the woman jump?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 2.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

1

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Question 2 : How many men on bicycles pursued the hero and the woman?

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(**B**) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Very Confidential

1 2 3 4 5

Question 3 : Where was the church located?

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C). Did you **REMEMBER** or **KNOW** the answer?

Question 4 : How many of the chasers had weapons?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don’t know the answer. (B)You feel you could recognize the answer if you saw it .

Now try to answer question 5.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C)Did you **REMEMBER** or **KNOW** the answer?

Question 5 : How men on foot chased the hero and the woman?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don’t know the answer. (B)You feel you could recognize the answer if you saw it .

Now try to answer question 6.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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(C).Did you **REMEMBER or KNOW** the answer?

Question 6 : Where did the woman hide?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 7.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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(C) Did you **REMEMBER or KNOW** the answer?

Question 7 : What did the hero tell the woman before she slapped him?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 8.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

- (B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

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- (C)Did you **REMEMBER** or **KNOW** the answer?

Question 8 : What was hanging over the streets in the market place?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 9.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

- (**B**) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

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(C) Did you **REMEMBER** or **KNOW** the answer?

Question 9 : What did the man on the ladder say to the chasers?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 10.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 10 : What did the man on the ladder have in his hand?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 11.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(**B**) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(**C**) Did you **REMEMBER** or **KNOW** the answer?

Question 11 : What did the man(the hero) take from the Police Captain?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 12.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(**A**) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(**B**) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(**C**) Did you **REMEMBER** or **KNOW** the answer?

Question 12 : How many of the Captain's policemen were present?

.....

Tick one of the options. If you did **not** answer this question was this because:

- Now try to answer question 13.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Not confident

Very Confidential

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- Question 13 : What did the Captain's policemen wave at the hero?**

.....

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (**B**) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

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- (C)Did you **REMEMBER** or **KNOW** the answer?

Question 14 : Who blew their whistles at the hero?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 15.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer?

Question 15 : What was in the bowl on the ground that the hero flicked at the men who were chasing him?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 16.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?**Question 16 : What was spilt on the streets in the path of the chasers?**

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 17.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?**Question 17 : How long did the chase last?**

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 18.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C)Did you **REMEMBER or KNOW** the answer?

Question 18 : What was the color of the hero's shirt?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B)You feel you could recognize the answer if you saw it .

Now try to answer question 19.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C)Did you **REMEMBER or KNOW** the answer?

Question 19 : What was the color of the hero's trousers?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B)You feel you could recognize the answer if you saw it .

Now try to answer question 20.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C)Did you **REMEMBER or KNOW** the answer?

Question 20 : What color was the bicycle the hero was riding?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B)You feel you could recognize the answer if you saw it .

Now try to answer question 21.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer?

Question 21 : What fell off the bicycle the hero was riding?

.....
 Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 22.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer?

Question 22 : What was the color of the woman's hat?

.....
 Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 23.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer?

Question 23 : What was the color of the woman's skirt?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 24.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (**A**) Was the answer in the **VIDEO** or **AUDIOTAPE**?
- (**B**) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

- (C) Did you **REMEMBER** or **KNOW** the answer?

Question 24 : What was the color of the woman's blouse ?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 25.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Was the answer in the VIDEO or AUDIOTAPE?

- (B)** How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 25 : What were the chaser wearing ?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 26.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 26 : What color was the pair of handcuffs ?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 27.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer?**Question 27 : What was the color of the Captain's policemen's uniforms ?**

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 28.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer?**Question 28 : What was the color of the policemen's socks?**

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 2.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer?

Question 29 : What was the color of the policemen's hats?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 30.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer?

Question 30 : What was the color of the policemen's bicycles?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(**A**) Was the answer in the **VIDEO or AUDIOTAPE**?

(**B**) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(**C**) Did you **REMEMBER** or **KNOW** the answer?

Thank you for completing Part One of the test. Seal this questionnaire in Envelope Number 1, and then open the second envelope with questionnaire. After completing the second questionnaire, please seal it in the envelope provided.

Appendix 7

Questionnaire Experiments 1b and 1c -recognition questionnaire- video plus additional information- source, confidence and remember/know judgements

GR 2/Add recognition

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DEPARTMENT OF PSYCHOLOGY

One the previous questionnaire you indicated that for you would recognize some of the answers to the questions. Once again I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. **Please follow the instructions carefully and give a response for ALL questions.**

Question 1 : From where did the man (the hero) and the woman jump?

- (A) A flight of stairs
- (B) A bridge
- (C) Tree top
- (D) Roof top

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer.

Question 2 : How many men on bicycles pursued the hero and the woman?

- (A) Three
- (B) Four
- (C) Five
- (D) Six

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer.

Question 3 : Where was the church located?

- (A) Near to the bridge
- (B) In the market
- (C) In the narrow streets
- (D) In the park

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer.

Question 4 : How many of the chasers had weapons?

- (A) One
- (B) Two
- (C) Three
- (D) Four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer.

Question 5 : How many men on foot chased the hero and the woman?

(A) Two

(B) Three

(C)Four

(D) Five

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer.

Question 6 : Where did the woman hide?

(A) In a house

(B) In a market stall

(C)Under a bridge

(D) In a church

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 7 : What did the hero tell the woman before she slapped him?

- (A) Jump
- (B) Can't you do anything?
- (C) Take all your clothes off!
- (D) I'll give you to the mobsters!

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 8 : What was hanging over the streets in the market place?

- (A) Baskets
- (B) Flower pots
- (C)Vegetables
- (D) Fabric banners

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 11 : What did the man (the hero) take from the police Captain?

- (A) Handcuffs and a bicycle
- (B) A gun
- (C) A truncheon
- (D) A hat

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

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5

(C) Did you **REMEMBER or KNOW** the answer.

Question 12 : How many of the Captain's policemen were present?

- (A) One
- (B) Two
- (C) Three
- (D) More than four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

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5

(C) Did you **REMEMBER or KNOW** the answer.

Question 13 : What did the Captain's policemen wave at the hero?

- (A) Truncheons
- (B) Hats
- (C) Guns
- (D) Handcuffs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer.

Question 14 : Who blew their whistles at the hero?

- (A) The chasers
- (B) The market sellers
- (C) Residents in the street
- (D) Policemen

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

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(C) Did you **REMEMBER or KNOW** the answer.

Question 15 : What was in the bowl on the ground that the hero flicked at the men who were chasing him?

- (A) Dust
- (B) Fruits
- (C) Oil
- (D) Water

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer.

Question 16 : What was spilt on the street on the path of the chasers?

- (A) Fruits and vegetables
- (B) Clothes
- (C) Hats
- (D) Chairs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer.

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer.

Question 20 : What color was the bicycle the hero was riding?

- (A) Red
- (B) Black
- (C) Silver
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer.

Question 21 : What fell off the bicycle the hero was riding?

- (A) The bell
- (B) The wheel
- (C) The seat
- (D) A bag of fruit

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 22 : What was the color of the woman's hat?

- (A) Brown
- (B) Blue
- (C) Silver
- (D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 23 : What was the color of the woman's skirt?

- (A) Red
- (B) Brown
- (C) Black
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident**Very Confident**

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer.**Question 24 : What was the color of the woman's blouse?**

(A) White

(B) Brown

(C) Blue

(D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident**Very Confident**

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer.**Question 25 : What were the chasers wearing?**

(A) Suits

(B) Tee shirts and shorts

(C) Tee shirts and jeans

(D) Uniforms

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident**Very Confident**

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 26 : What color was the pair of handcuffs?

- (A) Silver
(B) Gold
(C) Blue
(D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 27 : What was the color of the Captain's policemen uniforms?

- (A) White
(B) Green
(C) Red
(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 28 : What was the color of the Captain's policemen's socks?

- (A) Brown
- (B) Blue
- (C) Black
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer.

Question 29 : What was the color of the Captain's policemen's hats?

- (A) Brown
- (B) White
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer.

Question 30 : What was the color of the Captain's policemen's bicycles?

- (A) Silver
- (B) Red
- (C) Blue
- (D) White

The end !!! Thank you very much for your help.

Appendix 8

Experiment 1a-cued free recall questionnaire- video plus additional information-
confidence, remember/know and source judgements

GR 3/Add recall

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Thank you for agreeing to participate in this study. I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. Please follow the instructions carefully.

State your age in the space provided

AGE

.....

Tick one of the following
Female

() Male

()

Question 1 (a): From where did the man (the hero) and the woman jump?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 2.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the VIDEO or AUDIOTAPE?

Question 2 : How many men on bicycles pursued the hero and the woman?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 3.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 3 : Where was the church located?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 3.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 4 : How many of the chasers had weapons?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 5.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 5 : How many men on foot chased the hero and the woman?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 6.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 6 : Where did the woman hide?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 7.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 7 : What did the hero tell the woman before she slapped him?

.....

...

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 8.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the VIDEO or AUDIOTAPE?

Question 8 : What was hanging over the streets in the market place?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 9.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 9 : What did the man on the ladder say to the chasers?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 10.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 10 : What did the man on the ladder have in his hand?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 11.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 11 : What did the man (the hero) take from the police Captain?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 2.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 12 : How many of the Captain's policemen were present?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 13.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 13 : What did the Captain' policemen wave at the hero?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 14.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 14 : Who blew their whistles at the hero?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 2.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

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4

5

- (B) Did you **REMEMBER** or **KNOW** the answer?

- (C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 15 : What was in the bowl on the ground that the hero flicked at the men who were chasing him?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 16.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 16 : What was spilt on the street in the path of the chasers?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 17.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

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3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 17 : How long did the chase last?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 18.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

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5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 18 : What was the color of the hero's shirt?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 19.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 19 : What was the color of the hero's trousers?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 20.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

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- (B) Did you **REMEMBER** or **KNOW** the answer?

- (C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 20 : What color was the bicycle the hero was riding?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 21.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

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- (B) Did you **REMEMBER** or **KNOW** the answer?

- (C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 21 : What fell off the bicycle the hero was riding?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 22.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

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4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 22 : What was the color of the woman's hat?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 23.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO or AUDIOTAPE?**

Question 23 : What was the color of the woman's skirt?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 24.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER or KNOW** the answer?

(C) Was the answer in the **VIDEO or AUDIOTAPE?**

Question 24 : What was the color of the woman's blouse?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 25.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?**Question 25 : What were the chasers wearing?**

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 26.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident**Very Confident**

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?**Question 26 : What color was the pair of handcuffs?**

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 27.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 27 : What was the color of the Captain's policemen's uniforms?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 28.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 28 : What was the color of the Captain's policemen's socks?

.....
 Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 29.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER or KNOW** the answer?

(C) Was the answer in the **VIDEO or AUDIOTAPE**?

Question 29 : What was the color of the Captain's policemen's hats?

.....
 Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 30.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER or KNOW** the answer?

(C) Was the answer in the **VIDEO or AUDIOTAPE**?

Question 30 : What was the color of the Captain's policemen's bicycles?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER or KNOW** the answer?

(C) Was the answer in the **VIDEO or AUDIOTAPE**?

Thank you for completing Part One of the test. Seal this questionnaire in Envelope Number 1, and then open the second envelope with questionnaire. After completing the second questionnaire, please seal it in the envelope provided.

Appendix 9

Questionnaire Experiments 1b and 1c -recognition questionnaire- video plus additional information- confidence, Remember/know and source judgements

GR 3/Add recognition

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

One the previous questionnaire you indicated that for you would recognize some of the answers to the questions. Once again I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. **Please follow the instructions carefully and give a response for ALL questions.**

Question 1 : From where did the man (the hero) and the woman jump?

- (A) A flight of stairs
(B) A bridge
(C) Tree top
(D) Roof top

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the VIDEO or AUDIOTAPE.

Question 2 : How many men on bicycles pursued the hero and the woman?

- (A) Three
(B) Four
(C) Five
(D) Six

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 4 : How many of the chasers had weapons?

- (A) One
- (B) Two
- (C) Three
- (D) Four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 5 : How many men on foot chased the hero and the woman?

- (A) Two
- (B) Three
- (C)Four
- (D) Five

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

- (B) Did you **REMEMBER** or **KNOW** the answer.
(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 6 : Where did the woman hide?

- (A) In a house
(B) In a market stall
(C) Under a bridge
(D) In a church

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

- (B) Did you **REMEMBER** or **KNOW** the answer.
- (C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 7 : What did the hero tell the woman before she slapped him?

- (A) Jump!
(B) Can't you do anything?
(C) Take all your clothes off!
(D) I will give you to the mobsters!

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

- (B) Did you **REMEMBER** or **KNOW** the answer.
- (C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 8 : What was hanging over the streets in the market place?

- (A) Baskets
(B) Flower pots
(C) Vegetables
(D) Fabric banners

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1	2	3	4	5
1	2	3	4	5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the VIDEO or AUDIOTAPE.

Question 9 : What did the man on the ladder say to the chasers?

- (A) You are in trouble!
(B) This is no place for a race!
(C) Go that way!
(D) Have you seen a girl!

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the VIDEO or AUDIOTAPE.

Question 10 : What did the man on the ladder have in his hand?

- (A) Some fruit
(B) A fabric banner
(C) A bucket
(D) Some wood

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

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5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 11 : What did the man (the hero) take from the police Captain?

(A) Handcuffs and a bicycle

(B) A gun

(C) A truncheon

(D) A hat

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

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(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 12 : How many of the Captain's policemen were present?

(A) One

(B) Two

(C) Three

(D) More than four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident**Very Confident**

1

2

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(B) Did you **REMEMBER or KNOW** the answer.(C) Was the answer in the **VIDEO or AUDIOTAPE**.**Question 13 : What did the Captain's policemen wave at the hero?**

(A) Truncheons

(B) Hats

(C)Guns

(D) Handcuffs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident**Very Confident**

1

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(B) Did you **REMEMBER or KNOW** the answer.(C) Was the answer in the **VIDEO or AUDIOTAPE**.**Question 14 : Who blew their whistles at the hero?**

(A) The chasers

(B) The market sellers

(C) Residents in the streets

(D) Policemen

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident**Very Confident**

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(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 15 : What was in the bowl on the ground that the hero flicked at the men who were chasing him?

- (A) Dust
(B) Fruits
(C) Oil
(D) Water

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

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5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 16 : What was spilt on the street in the path of the chasers?

- (A) Fruits and vegetables
(B) Clothes
(C) Hats
(D) Chairs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 17 : How long did the chase last?

- (A) One minute
- (B) Thirty minutes
- (C) Six minutes
- (D) Eight minutes

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 18 : What was the color of the hero's shirt?

- (A) Black
- (B) White
- (C) Brown
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 19 : What was the color of the hero's trousers?

- (A) Beige
- (B) White
- (C) Blue
- (D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1

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(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 20 : What color was the bicycle the hero was riding?

- (A) Red
- (B) Black
- (C) Silver
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1

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(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 21 : What fell off the bicycle the hero was riding?

- (A) The bell
- (B) The wheel
- (C) The seat
- (D) A bag of fruit

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

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5

(B) Did you **REMEMBER or KNOW** the answer.

(C) Was the answer in the **VIDEO or AUDIOTAPE**.

Question 22 (a): What was the color of the woman's hat?

- (A) Brown
- (B) Blue
- (C) Silver
- (D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER or KNOW** the answer.

(C) Was the answer in the **VIDEO or AUDIOTAPE**.

Question 23 : What was the color of the woman's skirt?

- (A) Red
- (B) Brown
- (C) Black
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER or KNOW** the answer.

(C) Was the answer in the **VIDEO or AUDIOTAPE**.

Question 24 : What was the color of the woman's blouse?

- (A) White
- (B) Brown
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 25 : What were the chasers wearing?

- (A) Suits
- (B) Tee shirts and shorts
- (C) Tee shirts and jeans
- (D) Uniforms

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 26 : What color was the pair of handcuffs?

- (A) Silver
- (B) Gold
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident				Very Confident
1	2	3	4	5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 27 : What was the color of the Captain's policemen's uniform?

- (A) White
- (B) Green
- (C) Red
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident				Very Confident
1	2	3	4	5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 28 : What was the color of the Captain's policemen's socks?

- (A) Brown
- (B) Blue
- (C) Black
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident				Very Confident
1	2	3	4	5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 29 : What was the color of the Captain's policemen's hats?

- (A) Brown
- (B) White
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 30 : What was the color of the Captain's policemen's bicycles?

- (A) Silver
- (B) Red
- (C) Blue
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

The end!! Thank you for your help.

Appendix 10

Experiment 1a-cued free recall questionnaire- video plus irrelevant information-remember/know, source and confidence judgements

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

Thank you for agreeing to participate in this study. I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. Please follow the instructions carefully.

State your age in the space provided

AGE

Tick one of the following ☐ Male ☐ Female

Question 1 (a): What game was the children playing?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 2.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) If you answered the question and you remembered **SEEING** or **HEARING** in your mind the information you needed to answer the question, then you **REMEMBER** the answer. If instead, you simply had a feeling that I ‘just know’ the answer because it was familiar to me, then you **KNOW** the answer.

Did you **REMEMBER** or **KNOW** the answer?

(**B**) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

1

2

3

4

Very Confident

5

Question 2 : How many men on bicycles pursued the hero and the woman?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 3.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

1

2

3

4

Very Confident

5

Question 3 : Where was the children's house located?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 4.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

Question 4 : How many boys were playing?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 5.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

Question 5 : How many girls were playing?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 6.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

Question 6 : How old was the eldest child ?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 7.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

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Question 7 : What did the hero tell the woman before she slapped him?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 8.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

Question 8 : Where was the river located?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 9.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

Question 9 : What type of vehicle drove by the house while the children were playing?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 10.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?
- (B) Was the answer in the **VIDEO** or **AUDIOTAPE**?
- (C) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1 2 3 4 5

Question 10 : What was the color of the vehicle?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 2.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER or KNOW** the answer?
- (B) Was the answer in the **VIDEO or AUDIOTAPE**?
- (C) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1
2
3
4
5

Question 11 : At what time did the children return home?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 12.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?

- (B) Was the answer in the VIDEO or AUDIOTAPE?

- (C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

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3

4

5

Question 12 : How many of the Captain's policemen were present?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 13.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?

- (B) Was the answer in the VIDEO or AUDIOTAPE?

- (C) How confident are you that your answer is correct? One means ‘not confident’ and 5

means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

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Question 13 : What did the Captain’s policemen wave at the hero?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don’t know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 14.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

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4

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Question 14 : Who blew their whistles at the hero?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don’t know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 15.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

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Question 15 : What kind of animals did the children see?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 16.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE?**

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

Question 16 : Who spoke to the children while they were playing?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 16.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

Question 17 : Where were the owners of the house?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 18.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

Question 18 : What was the color of the hero's shirt?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 19.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?

- (**B**) Was the answer in the **VIDEO** or **AUDIOTAPE**?

- (C) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

Question 19 : What was the color of the hero's trousers?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 20.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A)Did you **REMEMBER** or **KNOW** the answer?

- (**B**) Was the answer in the **VIDEO** or **AUDIOTAPE**?

- (C) How confident are you that your answer is correct? One means ‘not confident’ and 5

means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

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4

5

Question 20 : Where did the children go immediately after playing?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 21.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(B) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

Question 21 : Where were the children playing their game?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 22.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

Question 22 : What was the color of the woman's hat?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 23.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

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Question 23 : What was the color of the woman's skirt?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 24.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

Question 24 : What was the color of the woman's blouse?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 25.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

Question 25 : What were the chasers wearing?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 26.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?

- (B) Was the answer in the VIDEO or AUDIOTAPE?

- (C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

Question 26 : What color was the pair of handcuffs?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 27.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Did you **REMEMBER** or **KNOW** the answer?

- (B) Was the answer in the VIDEO or AUDIOTAPE?

- (C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

Question 27 : What was the color of the Captain's policemen's uniform?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 28.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

Question 28 : What was the color of the Captain's policemen's socks?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 29.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident				Very Confident
1	2	3	4	5

Question 29 : What was the color of the Captain's policemen's hats?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 29.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER or KNOW** the answer?

(B) Was the answer in the **VIDEO or AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident				Very Confident
1	2	3	4	5

Question 30 : What was the color of the Captain's policemen's bicycles?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Did you **REMEMBER** or **KNOW** the answer?

(**B**) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(C) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1 2 3 4 5

Thank you for completing Part One of the test. Seal this questionnaire in Envelope Number 1, and then open the second envelope with questionnaire. After completing the second questionnaire, please seal it in the envelope provided.

Appendix 11

Questionnaire Experiments 1b and 1c -recognition questionnaire- video plus irrelevant information- remember/know, source and confidence judgements

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

One the previous questionnaire you indicated that for you would recognize some of the answers to the questions. Once again I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. **Please follow the instructions carefully and give a response for ALL questions.**

Question 1 (a): What game was the children playing?

- (A) Football
- (B) Chess
- (C) Cricket
- (D) Hide and seek

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

Question 2 : How many men on bicycles pursued the hero and the woman?

- (A) Three
- (B) Four
- (C) Five
- (D) Six

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 3 : Where was the children's home ?

- (A) In the city
- (B) In the country
- (C) Near to a supermarket
- (D) Next to a school

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 4 : How many boys were playing?

- (A) Two
- (B) Three
- (C) Four
- (D) Five

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

Question 5 : How many girls were playing?

(A) One

(B) Two

(C) Three

(D) Four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1

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5

Question 6 : How old was the eldest child ?

(A) Seven years

(B) Nine years

(C) Ten years

(D) Thirteen years

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

Question 7 : What did the hero tell the woman before she slapped him?

- (A) Jump
- (B) Can't you do anything
- (C) Take all your clothes off!
- (D) I will give you to the mobsters!

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1

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3

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5

Question 8 : What was the river located?

- (A) In the forest
- (B) On a farm
- (C) In a garden
- (D) Next to a school

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confidential

5

Question 9 : What type of vehicle drove by the house while the children were playing?

- (A) A truck
(B) A caravan
(C) A tractor
(D) A car

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

5

Question 10 : What was the color of the vehicle?

- (A) Green
(B) White
(C) Red
(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

5

Question 11 : At what time did the children return home?

- (A) 5 pm
(B) 6 pm
(C) 7pm
(D) 8 pm

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

1 2 3 4 5

Question 12 : How many of the Captain's policemen were present?

- (A) One
(B) Two
(C) Three
(D) More than four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

1 2 3 4 5

Question 15 : What kind of animals did the children see?

- (A) Goats
- (B) Pigs
- (C) Sheep
- (D) Dogs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident		Very Confident		
1	2	3	4	5

Question 16 : Who spoke to the children while they were playing?

- (A) A policeman
- (B) The children's parents
- (C) A farmer
- (D) The owners of the house

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident		Very Confident		
1	2	3	4	5

Question 17 : Where were the owners of the house?

- (A) On vacation
- (B) Shopping
- (C) Playing with the children
- (D) In their house

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

1

2

3

4

Very Confident

5

Question 18 : What was the color of the hero's shirt?

(A) Black

(B) White

(C) Brown

(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

1

2

3

4

Very Confident

5

Question 19 : What was the color of the hero's trousers?

(A) Beige

(B) White

(C) Blue

(D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 20 : Where did the children go immediately after playing?

- (A) Home
- (B) To see some animals
- (C) To visit some friends
- (D) Shopping

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 21 : Where were the children playing their game?

- (A) In a garden
- (B) In a field
- (C) In school
- (D) On a farm

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 22 : What was the color of the woman's hat?

- (A) Brown
(B) Blue
(C) Silver
(D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

5

Question 23 : What was the color of the woman's skirt?

- (A) Red
(B) Brown
(C) Black
(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

5

Question 24 : What was the color of the woman's blouse?

- (A) White
(B) Brown
(C) Blue
(D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

1

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Question 25 : What were the chasers wearing?

- (A) Suits
(B) Tee shirts and shorts
(C) Tee shirts and jeans
(D) Uniforms

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1

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Question 26 : What color was the pair of handcuffs?

- (A) Silver
(B) Gold
(C) Blue
(D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident				ery Confident
1	2	3	4	5

Question 27 : What was the color of the Captain's policemen's uniform?

- (A) White
- (B) Green
- (C) Red
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident				Very Confident
1	2	3	4	5

Question 28 : What was the color of the Captain's policemen's socks?

- (A) Brown
- (B) Blue
- (C) Black
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the VIDEO/AUDIOTAPE.

(C) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

Question 29 : What was the color of the Captain's policemen's hats?

(A) Brown

(B) White

(C) Blue

(D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER** /**KNOW** the answer.

(B) Was the answer in the VIDEO/AUDIOTAPE.

(C) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

Question 30 : What was the color of the Captain's policemen's bicycles?

(A) Silver

(B) Red

(C) Blue

(D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER** /**KNOW** the answer.

(B) Was the answer in the VIDEO/AUDIOTAPE.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

Appendix 12

Questionnaire Experiments 1b and 1c -recognition questionnaire- video plus irrelevant information- remember/know, source and confidence judgements

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

One the previous questionnaire you indicated that for you would recognize some of the answers to the questions. Once again I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. **Please follow the instructions carefully and give a response for ALL questions.**

Question 1 (a): What game was the children playing?

- (A) Football
- (B) Chess
- (C) Cricket
- (D) Hide and seek

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

Question 2 : How many men on bicycles pursued the hero and the woman?

- (A) Three
- (B) Four
- (C) Five
- (D) Six

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 3 : Where was the children's home ?

- (A) In the city
- (B) In the country
- (C) Near to a supermarket
- (D) Next to a school

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 4 : How many boys were playing?

- (A) Two
- (B) Three
- (C) Four
- (D) Five

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 5 : How many girls were playing?

- (A) One
- (B) Two
- (C) Three
- (D) Four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 6 : How old was the eldest child ?

- (A) Seven years
- (B) Nine years
- (C) Ten years
- (D) Thirteen years

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 7 : What did the hero tell the woman before she slapped him?

- (A) Jump
- (B) Can't you do anything
- (C) Take all your clothes off!
- (D) I will give you to the mobsters!

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 8 : What was the river located?

- (A) In the forest
- (B) On a farm
- (C) In a garden
- (D) Next to a school

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 9 : What type of vehicle drove by the house while the children were playing?

- (A) A truck
- (B) A caravan
- (C) A tractor
- (D) A car

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 10 : What was the color of the vehicle?

- (A) Green
- (B) White
- (C) Red
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 11 : At what time did the children return home?

- (A) 5 pm
- (B) 6 pm
- (C) 7pm
- (D) 8 pm

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 12 : How many of the Captain's policemen were present?

- (A) One
- (B)Two
- (C) Three
- (D) More than four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 13 : What did the Captain's policemen wave at the hero?

- (A) Truncheons
- (B) Hats
- (C)Guns
- (D) Handcuffs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 14 : Who blew their whistles at the hero?

- (A) The chasers
- (B) The market sellers
- (C) Residents in the street
- (D) Policemen

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 15 : What kind of animals did the children see?

- (A) Goats
- (B) Pigs
- (C) Sheep
- (D) Dogs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 16 : Who spoke to the children while they were playing?

- (A) A policeman
- (B) The children's parents
- (C) A farmer
- (D) The owners of the house

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 17 : Where were the owners of the house?

- (A) On vacation
- (B) Shopping
- (C) Playing with the children
- (D) In their house

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident			Very Confident		
1	2	3	4	5	

Question 18 : What was the color of the hero’s shirt?

- (A) Black
- (B) White
- (C) Brown
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident			Very Confident		
1	2	3	4	5	

Question 19 : What was the color of the hero's trousers?

- (A) Beige
(B) White
(C) Blue
(D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

1	2	3	4	5
1	2	3	4	5

Question 20 : Where did the children go immediately after playing?

- (A) Home
(B) To see some animals
(C) To visit some friends
(D) Shopping

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

1 2 3 4 5

Question 21 : Where were the children playing their game?

- (A) In a garden
(B) In a field
(C) In school
(D) On a farm

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

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5

Question 22 : What was the color of the woman's hat?

- (A) Brown
(B) Blue
(C) Silver
(D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confidential

1

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4

5

Question 23 : What was the color of the woman's skirt?

- (A) Red
- (B) Brown
- (C) Black
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1

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5

Question 24 : What was the color of the woman's blouse?

- (A) White
- (B) Brown
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

Question 25 : What were the chasers wearing?

- (A) Suits
- (B) Tee shirts and shorts
- (C) Tee shirts and jeans
- (D) Uniforms

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident			Very Confident		
1	2	3	4	5	

Question 26 : What color was the pair of handcuffs?

- (A) Silver
- (B) Gold
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident			Very Confident		
1	2	3	4	5	

Question 27 : What was the color of the Captain's policemen's uniform?

- (A) White
- (B) Green
- (C) Red
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

Question 28 : What was the color of the Captain's policemen's socks?

- (A) Brown
- (B) Blue
- (C) Black
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Did you **REMEMBER /KNOW** the answer.

(B) Was the answer in the **VIDEO/AUDIOTAPE**.

(C) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

Question 29 : What was the color of the Captain's policemen's hats?

- (A) Brown
- (B) White
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Question 30 : What was the color of the Captain's policemen's bicycles?

- (A) Silver
- (B) Red
- (C) Blue
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Did you **REMEMBER /KNOW** the answer.
- (B) Was the answer in the **VIDEO/AUDIOTAPE**.
- (C) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

Appendix 13

Experiment 1a-cued free recall questionnaire- video plus irrelevant information- source, confidence and remember/know judgements

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

Thank you for agreeing to participate in this study. I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. Please follow the instructions carefully.

State your age in the space provided

AGE

.....

Tick one of the following

() Male

() Female

Question 1 (a): What game was the children playing?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 2.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 2 : How many men on bicycles pursued the hero and the woman?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 3.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 3 : Where was the children's house located?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 4.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 4 : How many boys were playing?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 5.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 5 : How many girls were playing?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 6.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer?

Question 6 : Where old was the eldest child?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don’t know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 7.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer?

Question 7 : What did the hero tell the woman before she slapped him?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 8.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer?

Question 8 : Where was the river located?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 9.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer?

Question 9 : What type of vehicle drove by the house while the children were playing?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 10.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

- (**B**) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

- (C) Did you **REMEMBER** or **KNOW** the answer?

Question 10 : What was the color of the vehicle?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 11.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

- (**B**) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 11 : At what time did the children return home?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 12.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 12 : How many of the Captain's policemen were present?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 13.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE?

(B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 13 : What did the Captain's policemen wave at the hero?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 14.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

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4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 14 : Who blew their whistles at the hero?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 15.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer?

Question 15 : What kind of animals did the children see?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 16.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer?

Question 16 : Who spoke to the children while they were playing?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 17.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(**B**) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 17 : Where were the owners of the house?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 18.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 18 : What was the color of the hero's shirt?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 19.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer?

Question 19: What was the color of the hero's trousers?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 20.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer?

Question 20 : Where did the children go immediately after playing?

.....
..
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 21.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER or KNOW** the answer?

Question 21 : Where were the children playing their game?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 22.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE?**

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

1

2

3

4

Very Confident

5

(C)Did you **REMEMBER** or **KNOW** the answer?

Question 22 : What was the color of the woman's hat?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B)You feel you could recognize the answer if you saw it .

Now try to answer question 23.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

1

2

3

4

Very Confident

5

(C)Did you **REMEMBER** or **KNOW** the answer?

Question 23 : What was the color of the woman's skirt?

.....

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B)You feel you could recognize the answer if you saw it .

Now try to answer question 24.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE?

(B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(C)Did you **REMEMBER** or **KNOW** the answer?

Question 24 : What was the color of the woman's blouse ?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 25.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE?

(B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(C)Did you **REMEMBER** or **KNOW** the answer?

Question 25 : What were the chasers wearing ?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 26.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(C)Did you **REMEMBER** or **KNOW** the answer?

Question 26 : What color was the pair of handcuffs ?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 27.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer?

Question 27 : What was the color of the Captain's policemen's uniforms ?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 28.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer?

Question 28 : What was the color of the policemen's socks?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 29.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**?

(B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer?

Question 29 : What was the color of the policemen's hats?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 30.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Was the answer in the **VIDEO or AUDIOTAPE**?
- (B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident			Very Confident		
1	2	3	4	5	

- (C) Did you **REMEMBER or KNOW** the answer?

Question 30 : What was the color of the policemen's bicycles?

.....
Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) Was the answer in the **VIDEO or AUDIOTAPE**?
- (B) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident			Very Confident		
1	2	3	4	5	

- (C) Did you **REMEMBER or KNOW** the answer?

Thank you for completing Part One of the test. Seal this questionnaire in Envelope Number 1, and then open the second envelope with questionnaire. After completing the second questionnaire, please seal it in the envelope provided.

Questionnaire Experiments 1b and 1c -recognition questionnaire- video plus irrelevant information- video, confidence and remember/know judgements

DEPARTMENT OF PSYCHOLOGY

Question 1 (a): What game was the children playing?

- If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(B) How confident are you that your answer is correct.

Very Confidential

(C) Did you **REMEMBER** or **KNOW** the answer.

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 3 : Where was the children's house located ?

(A) In the city

(B) In the country

(C) Near to a supermarket

(D) Next to a school

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 4 : How many boys were playing?

(A) Two

(B) Three

(C) Four

(D) Five

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 5 : How many girls were playing?

- (A) One
(B) Two
(C) Three
(D) Four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 6 : How old was the eldest child ?

- (A) Seven years
(B) Nine years
(C) Ten years
(D) Thirteen years

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 7 : What did the hero tell the woman before she slapped him?

- (A) Jump
(B) Can't you do anything
(C) Take all your clothes off!
(D) I will give you to the mobsters!

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Was the answer in the VIDEO or AUDIOTAPE.

- (B)** How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

- (C) Did you **REMEMBER** or **KNOW** the answer.

Question 8 : What was the river located?

- (A) In the forest
(B) On a farm
(C) In a garden
(D) Next to a school

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

- (A) Was the answer in the VIDEO or AUDIOTAPE.

- (B)** How confident are you that your answer is correct.

Not confident

Very Confidential

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- (C) Did you **REMEMBER** or **KNOW** the answer.

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 11 : At what time did the children return home?

- (A) 5 pm
- (B) 6 pm
- (C) 7pm
- (D) 8 pm

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

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(C) Did you **REMEMBER or KNOW** the answer.

Question 12 : How many of the Captain's policemen were present?

- (A) One
- (B)Two
- (C) Three
- (D) More than four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

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(C) Did you **REMEMBER or KNOW** the answer.

Question 13 : What did the Captain's policemen wave at the hero?

- (A) Truncheons
- (B) Hats
- (C)Guns
- (D) Handcuffs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

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(C) Did you **REMEMBER or KNOW** the answer.

Question 14 : Who blew their whistles at the hero?

- (A) The chasers
- (B) The market sellers
- (C) Residents in the street
- (D) Policemen

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

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(C) Did you **REMEMBER or KNOW** the answer.

Question 15 : What kind of animals did the children see?

- (A) Goats
- (B) Pigs
- (C) Sheep
- (D) Dogs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

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(C) Did you **REMEMBER** or **KNOW** the answer.

Question 16: Who spoke to the children while they were playing?

(A) A policeman

(B) The children's parents

(C) A farmer

(D) The owners of the house

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

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(C) Did you **REMEMBER** or **KNOW** the answer.

Question 17 : Where were the owners of the house?

(A) On vacation

(B) Shopping

(C) Playing with the children

(D) In the house

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

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(C) Did you **REMEMBER** or **KNOW** the answer.

Question 18 : What was the color of the hero's shirt?

- (A) Black
(B) White
(C) Brown
(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

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(C) Did you **REMEMBER** or **KNOW** the answer.

Question 19 : What was the color of the hero's trousers?

- (A) Beige
(B) White
(C) Blue
(D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

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(C) Did you **REMEMBER** or **KNOW** the answer.

- (A) Brown
(B) Blue
(C) Silver
(D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

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(C) Did you **REMEMBER** or **KNOW** the answer.

Question 23 : What was the color of the woman's skirt?

(A) Red

(B) Brown

(C) Black

(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

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(C) Did you **REMEMBER** or **KNOW** the answer.

Question 24 : What was the color of the woman's blouse?

(A) White

(B) Brown

(C) Blue

(D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

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(C) Did you **REMEMBER** or **KNOW** the answer.

Question 25 : What were the chasers wearing?

- (A) Suits
(B) Tee shirts and shorts
(C) Tee shirts and jeans
(D) Uniforms

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the VIDEO or AUDIOTAPE.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

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(C) Did you **REMEMBER** or **KNOW** the answer.

Question 26 : What color was the pair of handcuffs?

- (A) Silver
(B) Gold
(C) Blue
(D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confidential

1

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5

(C) Did you **REMEMBER** or **KNOW** the answer.

Question 27 : What color were the Captain's policemen's uniforms?

- (A) White
- (B) Green
- (C) Red
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

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(C) Did you **REMEMBER** or **KNOW** the answer.

Question 28 : What color were the Captain's policemen's socks?

- (A) Brown
- (B) Blue
- (C) Black
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO** or **AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1

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(C) Did you **REMEMBER** or **KNOW** the answer.

Question 29 : What color were the Captain's policemen's hats?

- (A) Brown
- (B) White
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer.

Question 30 : What color were the Captain's policemen's bicycles?

- (A) Silver
- (B) Red
- (C) Blue
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) Was the answer in the **VIDEO or AUDIOTAPE**.

(B) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(C) Did you **REMEMBER or KNOW** the answer.

The End!! Thank you very much for your help.

Appendix 15

Experiment 1a-cued free recall questionnaire- video plus irrelevant information-
confidence, remember/know and source judgements

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

Thank you for agreeing to participate in this study. I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. Please follow the instructions carefully.

State your age in the space provided

AGE

.....

Tick one of the following
Female

() Male

()

Question 1 : What game was the children playing?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 2.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

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5

(**B**) If you answered the question and you remembered **SEEING** or **HEARING** in your mind the information you needed to answer the question, then you **REMEMBER** the answer. If instead, you simply had a feeling that I ‘just know’ the answer because it was familiar to me, then you **KNOW** the answer.

Did you **REMEMBER** or **KNOW** the answer?

(**C**) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 2 : How many men on bicycles pursued the hero and the woman?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don’t know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 3.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(**A**) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(**B**) Did you **REMEMBER** or **KNOW** the answer?

(**C**) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 3 : Where was the children’s house located?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don’t know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 4.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 4 : How many boys were playing?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 5.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(B)Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 5 : How many girls were playing?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 6.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER or KNOW** the answer?

(C) Was the answer in the **VIDEO or AUDIOTAPE**?

Question 6 : Where old was the eldest child?

.....

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 7.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the VIDEO or AUDIOTAPE?

Question 7 : What did the hero tell the woman before she slapped him?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 8.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(**A**) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 8 : Where was the river located?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 9.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 9 : What type of vehicle drove by the house while the children were playing?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 10.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 10 : What was the color of the vehicle?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 11.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 11 : At what time did the children return home?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 12.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 14 : Who blew their whistles at the hero?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 15.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

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(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 15 : What kind of animals did the children see?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 16.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5

means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

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(B) Did you **REMEMBER or KNOW** the answer?

(C) Was the answer in the **VIDEO or AUDIOTAPE**?

Question 16 : Who spoke to the children while they were playing?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 17.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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(B) Did you **REMEMBER or KNOW** the answer?

(C) Was the answer in the **VIDEO or AUDIOTAPE**?

Question 17 : Where were the owners of the house?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 18.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 18 : What was the color of the hero's shirt?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 19.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 19 : What was the color of the hero's trousers?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 20.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

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- (B) Did you **REMEMBER** or **KNOW** the answer?

- (C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 20 : Where did the children go immediately after playing?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 21.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

- (A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

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(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 21 : Where were the children playing their game?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 22.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 22 : What was the color of the woman's hat?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 23.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5

means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 23 : What was the color of the woman's skirt?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 24.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

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(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 24 : What was the color of the woman's blouse ?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 25.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

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(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the VIDEO or AUDIOTAPE?

Question 25 : What were the chasers wearing ?

Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 26.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means ‘not confident’ and 5 means ‘very confident’. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

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4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 26 : What color was the pair of handcuffs ?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 26.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the VIDEO or AUDIOTAPE?

Question 27 : What was the color of the Captain's policemen's uniforms ?

Tick one of the options. If you did **not** answer this question was this because:

- (A) You don't know the answer. (B) You feel you could recognize the answer if you saw it.

Now try to answer question 28.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER or KNOW** the answer?

(C) Was the answer in the **VIDEO or AUDIOTAPE**?

Question 28 : What was the color of the policemen's socks?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 29.

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER or KNOW** the answer?

(C) Was the answer in the **VIDEO or AUDIOTAPE**?

Question 29 : What was the color of the policemen's hats?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 30

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5

means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Question 30 : What was the color of the policemen's bicycles?

.....
Tick one of the options. If you did **not** answer this question was this because:

(A) You don't know the answer. (B) You feel you could recognize the answer if you saw it .

Now try to answer question 30

If you answered the question, be sure to **answer all parts** of the following questions by **circling** your choice.

(A) How confident are you that your answer is correct? One means 'not confident' and 5 means 'very confident'. The higher the number you circle, the more confident you are.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer?

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**?

Thank you for completing Part One of the test. Seal this questionnaire in Envelope Number 1, and then open the second envelope with questionnaire. After completing the second questionnaire, please seal it in the envelope provided.

Appendix 16

Questionnaire Experiments 1b and 1c -recognition questionnaire- video plus irrelevant information- confidence, remember/know judgements and source judgements

GR 3/Irr recognition

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

One the previous questionnaire you indicated that for you would recognize some of the answers to the questions. Once again I am interested in how much you can tell me about the information you saw in the video and heard in the audio-tape yesterday. I want to make sure that what you tell me is as accurate as possible. Do not guess, if you cannot answer the question, Write on the paper 'I cannot answer the question'. **Please follow the instructions carefully and give a response for ALL questions.**

Question 1 : What game was the children playing?

- (A) Football
(B) Chess
(C) Cricket
(D) Hide and seek

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1
2
3
4
5

(B) Did you REMEMBER or KNOW the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 2 : How many men on bicycles pursued the hero and the woman?

- (A) Three
(B) Four
(C) Five
(D) Six

If you answered the question, be sure to **answer all parts** of the following questions by

circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the VIDEO or AUDIOTAPE.

Question 3 : Where was the children's house located ?

- (A) In the city
(B) In the country
(C) Near to a supermarket
(D) Next to a school

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 4 : How many boys were playing?

- (A) Two
(B) Three
(C) Four
(D) Five

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 5 : How many girls were playing?

- (A) One
(B) Two
(C) Three
(D) Four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 6 : How old was the eldest child ?

- (A) Seven years
(B) Nine years
(C) Ten years
(D) Thirteen years

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 10 : What was the color of the vehicle?

(A) Green

(B) White

(C) Red

(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 11 : At what time did the children return home?

(A) 5 μm

(B) 6 pm

(C) 7pm

(D) 8 pm

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident**Very Confident**

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.**Question 12 : How many of the Captain's policemen were present?**

(A) One

(B) Two

(C) Three

(D) More than four

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident**Very Confident**

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.**Question 13 : What did the Captain's policemen wave at the hero?**

(A) Truncheons

(B) Hats

(C) Guns

(D) Handcuffs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident**Very Confident**

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 14 : Who blew their whistles at the hero?

- (A) The chasers
(B) The market sellers
(C) Residents in the street
(D) Policemen

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 15 : What kind of animals did the children see?

- (A) Goats
(B) Pigs
(C) Sheep
(D) Dogs

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1
2
3
4
5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 16 : Who spoke to the children while they were playing?

- (A) A policeman
(B) The children's parents
(C) A farmer
(D) The owners of the house

If you answered the question, be sure to **answer all parts** of the following questions by

circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 17 : Where were the owners of the house?

(A) On vacation

(B) Shopping

(C) Playing with the children

(D) In their house

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 18 : What was the color of the hero's shirt?

(A) Black

(B) White

(C) Brown

(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident**Very Confident**

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.**Question 19 : What was the color of the hero's trousers?**

(A) Beige

(B) White

(C) Blue

(D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident**Very Confident**

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.**Question 20 : Where did the children go immediately after playing?**

(A) Home

(B) To see some animals

(C) To visit some friends

(D)Shopping

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident**Very Confident**

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 21 : Where were the children playing their game?

- (A) In a garden
(B) In a field
(C) In school
(D) On a farm

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 22 : What was the color of the woman's hat?

- (A) Brown
(B) Blue
(C) Silver
(D) Red

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the VIDEO or AUDIOTAPE.

Question 23 : What was the color of the woman's skirt?

- (A) Red
(B) Brown
(C) Black
(D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1
2
3
4
5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 24 : What was the color of the woman's blouse?

- (A) White
(B) Brown
(C) Blue
(D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confidential

1
2
3
4
5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 25 : What were the chasers wearing?

- (A) Suits
(B) Tee shirts and shorts
(C) Tee shirts and jeans
(D) Uniforms

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident				Very Confident
1	2	3	4	5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 26 : What color was the pair of handcuffs?

- (A) Silver
- (B) Gold
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident				Very Confident
1	2	3	4	5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 27 : What color were the Captain's policemen's uniforms?

- (A) White
- (B) Green
- (C) Red
- (D) Blue

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 28 : What color were the Captain's policemen's socks?

- (A) Brown
- (B) Blue
- (C) Black
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO** or **AUDIOTAPE**.

Question 29 : What color were the Captain's policemen's hats?

- (A) Brown
- (B) White
- (C) Blue
- (D) Black

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1 2 3 4 5

(B) Did you **REMEMBER** or **KNOW** the answer.

(C) Was the answer in the **VIDEO or AUDIOTAPE**.

Question 30 : What color were the Captain's policemen's bicycles?

- (A) Silver
- (B) Red
- (C) Blue
- (D) White

If you answered the question, be sure to **answer all parts** of the following questions by circling your choice.

(A) How confident are you that your answer is correct.

Not confident

Very Confident

1

2

3

4

5

(B) Did you **REMEMBER or KNOW** the answer.

(C) Was the answer in the **VIDEO or AUDIOTAPE**.

The End!! Thank you very much for your help.

Appendix 17

Post experimental questionnaire given attached to the questionnaires used in Experiment 1a, 1b and 1c.

The following questions relate to your performance on the memory test you completed. Please answer the questions as completely as you can.

1. Although you were asked to distinguish between ‘remember’ and ‘know’, how easy was this for you?

Circle one of the numbers.

5	4	3	2	1
very difficult	difficult	moderately easy	easy	very easy

Why was it difficult/or easy?

.....

.....

.....

2. In addition to answering questions based on ‘remembering’ and ‘knowing’ were any other methods of recalling information useful to you? No Yes (Circle one).

If yes, please state what methods you used and how they helped you to answer the questions.

.....

.....

.....

3. Please tell me on what basis you decided how confident you were that your answers were correct?

.....

.....

Appendix 18
Cued-free recall questionnaire used in Experiment 3a

AGE

GENDER

This questionnaire consists of 2 parts. Please read instructions carefully and give a response for all questions.

Non-Directive Instruction

I am interested in what you can tell me about the video you have just watched. However, I want to make sure that what you tell me is as accurate as it can be. So, what I am asking you to do is to answer the following questions as truthfully as you can. If you really don't know the answer, do not guess, and do not be afraid to write on the questionnaire 'I do not know.' If you cannot answer the question, I want you to tell me if this was because (a) you did not know the answer or (b) you would know the answer if I gave you some clues.

The following is an example:

Question: Was the film about children in a playground?

No.

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

1. From where did the hero and the woman jump at the beginning of the film?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

2. How many men (riding bicycles and on foot) chased the hero and the woman?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

3. Where was the church located?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

4. How many of the chasers had weapons?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

5. How many men on bicycles chased the hero and the woman?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

6. Where did the woman hide half way through the film?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

7. What did the hero tell the woman before she slapped him?

..... ()
 State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

8. What was hanging over the streets in the market place?

..... ()
 State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

9. What did the man on the ladder say to the chasers?

..... ()
 State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

10. What did the man on the ladder have in his hand?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

11. What did the hero take from the police Captain?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

12. How many of the Captain's policemen were present?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

13. What did the Captain's policemen wave at the hero?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

14. Who blew their whistles at the hero?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

15. What was in the bowl on the ground that the hero flicked at the men who were chasing him?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

16. At the end of the film what was spilt on the street?

..... ()

How confident are you that your answer is correct? (**Circle one phrase**)

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

17. How long did the chase last?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

18. What was the colour of the hero's shirt?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

19. What was the colour of the hero's trousers?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

20. What colour was the bicycle the hero was riding?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

21. What fell off the bicycle the hero was riding?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

22. What was the colour of the woman's hat?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

23. What was the colour of the woman's skirt?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

24. What was the colour of the woman's blouse?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

25. What were the chasers wearing?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

26. What colour was the pair of handcuffs?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

27.What was the colour of the policemen's uniform?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

28. What was the colour of the policemen's socks?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

29. What was the colour of the policemen's hats?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

30. What was the colour of the policemen's bicycles?

..... ()

Thank you for completing Part One of the test. Seal this questionnaire in Envelope Number 1, and then open the second envelope with questionnaire. After completing the second questionnaire, please seal it in the envelope provided.

Appendix 19

AREC REMEMBER QUES. PART 2: RES. CODE

Recognition Questionnaire used in Experiment 3b and 3c

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

Non-Directive Instruction:

In this section, you will be asked questions about the video, but this time you will be provided with alternative answers and you just have to **tick the one** which you think is correct.

I am interested in what you can tell me about the video you have just watched. However, I want to make sure that what you tell me is as accurate as it can be. So, what I am asking you to do is to answer the following questions as truthfully as you can. If you really don't know the answer, do not guess, and do not be afraid to write on the questionnaire 'I do not know.'

The following is an example:

Question: What was the film about?

- A. A wildlife documentary
- B. Children in a playground
- C. A chase**
- D. Road safety

1. From where did the hero and the woman jump at the beginning of the film?

- (a). A flight of stairs
- (b). A bridge
- (c). Tree top
- (d). Roof top

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

2. How many men (riding bicycles and on foot) chased the hero and the woman?

- (a). Three
- (b). Four
- (c). Five
- (d). Six

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

3. Where was the church located?

- (a). Near to the bridge
- (b). In the market
- (c). In the narrow streets
- (d). In the park

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

4. How many of the chasers had weapons?

- (a). One
- (b). Two
- (c). Three
- (d). Four

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

5. How many men on bicycles chased the hero and the woman?

- (a). Two
- (b). Three
- (c). Four
- (d). Five

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

9. What did the man on the ladder say to the chasers?

- (a). You are in trouble!
- (b). This is no place for a race!
- (c). Go that way!
- (d). Have you see a girl? ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

10. What did the man on the ladder have in his hand?

- (a). Some fruit
- (b). A fabric banner
- (c). A bucket
- (d). Some wood ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

11. What did the hero take from the police Captain?

- (a). Handcuffs
- (b). A gun
- (c). A truncheon
- (d). A bicycle ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

12. How many of the Captain's policemen were present?

- (a). One
- (b). Two
- (c). Three
- (d). More than four ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**
Very confident **Not confident**

5 4 3 2 1

13. What did the Captain's policemen wave at the hero?

- (a). Truncheons
- (b). Hats
- (c). Guns
- (d). Handcuffs ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident **Not confident**

5 4 3 2 1

14. Who blew their whistles at the hero?

- (a). The chasers
- (b). The market sellers
- (c). Residents in the streets
- (d). Policemen ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident **Not confident**

5 4 3 2 1

15. What was in the bowl on the ground that the hero flicked at the men who were chasing him?

- (a). Dust
- (b). Fruits
- (c). Oil
- (d). Water ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident **Not confident**

5 4 3 2 1

16. At the end of the film what was spilt on the street?

- (a). Vegetables
- (b). Clothes
- (c). Hats
- (d). Chairs

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

17. How long did the chase last?

- (a). 1 minute
- (b). 4 minutes
- (c). 6 minutes
- (d). 8 minutes

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

18.What was the colour of the hero's shirt?

- (a). Black
- (b). White
- (c). Brown
- (d). Blue

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

19. What was the colour of the hero's trousers?

- (a). Beige
- (b). White
- (c). Blue
- (d). Red

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

20. What colour was the bicycle the hero was riding?

- (a). Red
 - (b). Black
 - (c). Silver
 - (d). Blue
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

21. What fell off the bicycle the hero was riding?

- (a). The bell
 - (b). The wheel
 - (c). The seat
 - (d). A bag of fruit
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

22. What was the colour of the woman's hat?

- (a). Brown
 - (b). Blue
 - (c). Silver
 - (d). Red
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

23. What was the colour of the woman's skirt?

- (a). Red
 - (b). Brown
 - (c). Black
 - (d). Blue
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

24. What was the colour of the woman's blouse?

- (a). White
 - (b). Brown
 - (c). Blue
 - (d). Black
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

25. What were the chasers wearing?

- (a). Suits
 - (b). Tee shirts and shorts
 - (c). Tee shirts and jeans
 - (d). Uniforms
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

26. What colour was the pair of handcuffs?

- (a). Silver
 - (b). Gold
 - (c). Blue
 - (d). Black
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

27.What was the colour of the policemen's uniform?

- (a). White
- (b). Green
- (c). Red
- (d). Blue

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

28. What was the colour of the policemen's socks?

- (a). Brown
- (b). Blue
- (c). Black
- (d). White

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

29 What was the colour of the policemen's hats?

- (a). Brown
- (b). White
- (c). Blue
- (d). Black

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

30. What was the colour of the policemen's bicycles?

- (a). Silver
- (b). Red
- (c). Blue
- (d). White

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

Thank you very much for completing this questionnaire.

Appendix 20
Cued-free recall questionnaire used in Experiment 3a

AGE

GENDER

This questionnaire consists of 2 parts. Please read instructions carefully and give a response for all questions.

Remember Instruction

I am interested in what you can tell me about the video you have just watched. However, I want to make sure that what you tell me is as accurate as it can be. So, what I am asking you to do is to answer the following questions **ONLY** if you can truthfully say that you **REMEMBER SEEING** and **HEARING** the detail or details in question. If you think that you know the answer, but don't actually **REMEMBER SEEING** or **HEARING** the details, then please **DO NOT** answer the question but do indicate whether you might recognize the correct answer from a list of alternatives. If you didn't see the details and really don't know the answer, then don't be afraid to indicate that you do not know the answer." Please don't guess and try to be as accurate as possible. If you cannot answer the question, I want you to tell me if this was because (a) you did not know the answer or (b) you would know the answer if I gave you some clues.

The following is an example:

Question: Was the film about children in a playground?

No.

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

1. From where did the hero and the woman jump at the beginning of the film?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

2. How many men (riding bicycles and on foot) chased the hero and the woman?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

3. Where was the church located?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

4. How many of the chasers had weapons?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

5. How many men on bicycles chased the hero and the woman?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

6. Where did the woman hide half way through the film?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

7. What did the hero tell the woman before she slapped him?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

8. What was hanging over the streets in the market place?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

9. What did the man on the ladder say to the chasers?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

10. What did the man on the ladder have in his hand?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

11. What did the hero take from the police Captain?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

12. How many of the Captain's policemen were present?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

13. What did the Captain's policemen wave at the hero?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

14. Who blew their whistles at the hero?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

15. What was in the bowl on the ground that the hero flicked at the men who were chasing him?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

16. At the end of the film what was spilt on the street?

..... ()

How confident are you that your answer is correct? **(Circle one phrase)**

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

17. How long did the chase last?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

A. Did not know the answer.

B. Did not know the answer but would recognise it if you saw it.

18.What was the colour of the hero's shirt?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

19. What was the colour of the hero's trousers?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

20. What colour was the bicycle the hero was riding?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

21. What fell off the bicycle the hero was riding?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

22. What was the colour of the woman's hat?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

23. What was the colour of the woman's skirt?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

24. What was the colour of the woman's blouse?

..... ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

25. What were the chasers wearing?

..... ()
 State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

26. What colour was the pair of handcuffs?

..... ()
 State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

27. What was the colour of the policemen's uniform?

..... ()
 State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

28. What was the colour of the policemen's socks?

..... ()
 State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

29. What was the colour of the policemen's hats?

..... ()
 State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

30. What was the colour of the policemen's bicycles?

..... ()
 .

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

If you did **NOT** give an answer please indicate whether this is because you:

- A. Did not know the answer.
- B. Did not know the answer but would recognise it if you saw it.

Thank you for completing Part One of the test. Seal this questionnaire in Envelope Number 1, and then open the second envelope with questionnaire. After completing the second questionnaire, please seal it in the envelope provided.

Appendix 21

AREC REMEMBER QUES. PART 2: RES. CODE

Recognition Questionnaire used in Experiment 3b and 3c

UNIVERSITY OF SOUTHAMPTON

DEPARTMENT OF PSYCHOLOGY

Remember Instruction

In this section, you will be asked questions about the video, but this time you will be provided with alternative answers and you just have to **tick the one** which you think is correct.

I am interested in what you can tell me about the video you have just watched. However, I want to make sure that what you tell me is as accurate as it can be. So, what I am asking you to do is to answer the following questions **ONLY** if you can truthfully say that you **REMEMBER SEEING** and **HEARING** the detail or details in question. If you think that you know the answer, but don't actually **REMEMBER SEEING** or **HEARING** the details, then please **DO NOT** answer the question but do indicate whether you might recognize the correct answer from a list of alternatives. If you didn't see the details and really don't know the answer, then don't be afraid to indicate that you do not know the answer by writing 'I do not know'. Please don't guess and try to be as accurate as possible.

The following is an example

Question: What was the film about?

- A. A wildlife documentary
- B. Children in a playground
- C. A chase**
- D. Road safety

1. From where did the hero and the woman jump at the beginning of the film?

- (a). A flight of stairs
- (b). A bridge
- (c). Tree top
- (d). Roof top

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

2. How many men (riding bicycles and on foot) chased the hero and the woman?

- (a). Three
- (b). Four
- (c). Five
- (d). Six

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

3. Where was the church located?

- (a). Near to the bridge
- (b). In the market
- (c). In the narrow streets
- (d). In the park

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

4. How many of the chasers had weapons?

- (a). One
- (b). Two
- (c). Three
- (d). Four

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

5. How many men on bicycles chased the hero and the woman?

- (a). Two
- (b). Three
- (c). Four
- (d). Five

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

6. Where did the woman hide half way through the film?

- (a). In a house
- (b). In a market stall
- (c). Under a bridge
- (d). In a church ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

7. What did the hero tell the woman before she slapped him?

- (a). Jump!
- (b). Can't you do anything!
- (c). Take all your clothes off!
- (d). I will give you to the mobsters! ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

8. What was hanging over the streets in the market place?

- (a). Baskets
- (b). Flower pots
- (c). Vegetables
- (d). Fabric banners ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

9. What did the man on the ladder say to the chasers?

- (a). You are in trouble!
- (b). This is no place for a race!
- (c). Go that way!
- (d). Have you see a girl? ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**
Very confident **Not confident**

5 4 3 2 1

10. What did the man on the ladder have in his hand?

- (a). Some fruit
- (b). A fabric banner
- (c). A bucket
- (d). Some wood ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident **Not confident**

5 4 3 2 1

11. What did the hero take from the police Captain?

- (a). Handcuffs
- (b). A gun
- (c). A truncheon
- (d). A bicycle ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident **Not confident**

5 4 3 2 1

12. How many of the Captain's policemen were present?

- (a). One
- (b). Two
- (c). Three
- (d). More than four ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

13. What did the Captain's policemen wave at the hero?

- (a). Truncheons
- (b). Hats
- (c). Guns
- (d). Handcuffs ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

14. Who blew their whistles at the hero?

- (a). The chasers
- (b). The market sellers
- (c). Residents in the streets
- (d). Policemen ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

15. What was in the bowl on the ground that the hero flicked at the men who were chasing him?

- (a). Dust
- (b). Fruits
- (c). Oil
- (d). Water ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

16. At the end of the film what was spilt on the street?

- (a). Vegetables
- (b). Clothes
- (c). Hats
- (d). Chairs

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

17. How long did the chase last?

- (a). 1 minute
- (b). 4 minutes
- (c). 6 minutes
- (d). 8 minutes

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

18. What was the colour of the hero's shirt?

- (a). Black
- (b). White
- (c). Brown
- (d). Blue

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

19. What was the colour of the hero's trousers?

- (a). Beige
- (b). White
- (c). Blue
- (d). Red

()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

20. What colour was the bicycle the hero was riding?

- (a). Red
 - (b). Black
 - (c). Silver
 - (d). Blue
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

21. What fell off the bicycle the hero was riding?

- (a). The bell
 - (b). The wheel
 - (c). The seat
 - (d). A bag of fruit
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

22. What was the colour of the woman's hat?

- (a). Brown
 - (b). Blue
 - (c). Silver
 - (d). Red
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

23. What was the colour of the woman's skirt?

- (a). Red
 - (b). Brown
 - (c). Black
 - (d). Blue
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

24. What was the colour of the woman's blouse?

- (a). White
 - (b). Brown
 - (c). Blue
 - (d). Black
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

25. What were the chasers wearing?

- (a). Suits
 - (b). Tee shirts and shorts
 - (c). Tee shirts and jeans
 - (d). Uniforms
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

26. What colour was the pair of handcuffs?

- (a). Silver
 - (b). Gold
 - (c). Blue
 - (d). Black
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

27. What was the colour of the policemen's uniform?

- (a). White
 - (b). Green
 - (c). Red
 - (d). Blue
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

28. What was the colour of the policemen's socks?

- (a). Brown
 - (b). Blue
 - (c). Black
 - (d). White
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

29 What was the colour of the policemen's hats?

- (a). Brown
 - (b). White
 - (c). Blue
 - (d). Black
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5 4 3 2 1

30. What was the colour of the policemen's bicycles?

- (a). Silver
 - (b). Red
 - (c). Blue
 - (d). White
- ()

State how confident you are that your answer is correct by circling **ONE** of the **numbers..**

Very confident

Not confident

5

4

3

2

1

Thank you very much for completing this questionnaire.

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