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Childhood Adversity: The Relationship with Facial Emotion Recognition and Homelessness

By

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Thesis submitted for the degree of Doctorate in Clinical Psychology

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ABSTRACT

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Chapter 1.

This thesis submission is composed of two chapters. The first is a systematic literature review exploring the role adverse of childhood experiences on facial emotion recognition in adults. This review aimed to deepen the understanding about how past childhood traumatic events may impact on the ability of people to recognise and identify emotional states in others. In total 16 articles were assessed as meeting the eligibility criteria in line with PRISMA guidelines on systematic reviews (Moher, Liberati, Tetzlaff, Altman, & Group, 2009). The articles were subjected to quality assessment and review. A relationship between childhood adversity and a deficit in adult ability to recognise emotion was found by the majority of studies. Results relating to the specificity of effect of different forms of abuse was highly variable. Similarly, the effect of maltreatment on recognition of certain emotions was unclear. Methodological variability and study quality are discussed as potential reasons for the range of results. This body of research is

in its infancy, further ideally prospective research in diverse populations with more consistent methodological approaches is required.

Chapter 2.

The second chapter sought to explore adverse childhood experiences in the homeless population and their relationship to emotion recognition and maladaptive behaviour. Complex trauma has been linked to deficits in social cognition, including emotion recognition in others. Deficits in emotion recognition ability are thought to be implicated in the development and maintenance of maladaptive behaviours and coping styles. These behaviours are often linked to continued or repeat episodes of homelessness and entrenched social exclusion (Maguire, Johnson & Vostanis, 2010).

This study aimed to explore the role of childhood adversity in facial emotion recognition (FER) ability and maladaptive behaviour. A sample of people currently experiencing homelessness (n=82) and a control sample (n=21) from the general population were recruited. Group comparison and correlational study designs were employed. The participants completed questionnaires on childhood adversity and current maladaptive behaviours, alongside a test of FER ability. Early adversity was very common among the homeless sample (98.8% compared to 67% in the general population). The homeless sample had significant impairments in FER ability compared to controls (t (102)=-8.17, p<.001), particularly on anger and sadness. Specific types of adversity were related to impaired FER performance; however, FER ability did not relate to maladaptive behaviour. The link between adversity and FER is explored and the implications of poor FER ability are discussed in terms of intervention and future research. The reasons for the lack of relationship between FER and maladaptive behaviours are discussed in terms of methodological issues

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DECLARATION OF AUTHORSHIP

I, Kate Hodgson, declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research:

Childhood Adversity: The Relationship with Facial Emotion Recognition and Homelessness.

I confirm that:

- This work was done wholly or mainly while in candidature for a research degree at this University;
- Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
- Where I have consulted the published work of others, this is always clearly attributed;
- Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
- I have acknowledged all main sources of help;
- Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
- None of this work has been published before submission.

Signed: ....

Date: .....23/5/2018.....

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Most importantly, I would like to thank all the participants of the study for giving their time to take part. I met some very inspiring people who despite difficult circumstances still wanted to contribute to increasing research in to the area of homelessness. I am grateful as well, to all the hostels who were involved in the research, without whom I would not have been able to recruit so many people.

I would also like to thank Stephanie Smith who conducted her project alongside my own. All the travelling, data entry, waiting around and sometimes difficult conversations with participants would have been so much harder without you.

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Chapter 1. Systematic Review of the Literature

A systematic review of the relationship between past childhood maltreatment and facial emotion recognition in adults

1.1 Introduction

1.1.1 Facial emotion recognition

Facial expressions of emotion are invaluable emotional and social signals. They have a strong evolutionary function in relation to social communication and survival. Facial expressions have immediate implications for behaviour (Jovev, Chanen, Green, Cotton, Proffitt, Colthart & Jackson, 2011). The intentions of others and people's relationships are mediated by the understanding of what emotion a person might be showing. An emotional expression can evoke emotional responding in others and motivate action (Keltner & Kring, 1998). Accurate processing of facial displays of emotion is a key skill that is critical to everyday functioning. The ability to discriminate between emotions is fundamental to appropriate interpersonal communication (Marsh & Blair 2008). Throughout this thesis, Facial emotion recognition (FER) is defined as the ability to infer emotional states in others by reading cues displayed on the face (Comparelli, Corigliano, DeCarolis, Mancinelli & Trovini, 2013).

Deficits in facial emotion recognition have been observed in numerous populations. For example, in schizophrenia (Aas, Kauppi, Brandt, Tesli, Kaufman, Steen, Agartz *et al*., 2017) difficulties with facial emotion recognition have been linked to problems with social interaction, paranoia and hallucinations that are commonly seen in this condition (Turetsky, Kohler, Indersmitten, Bhati, Charbonnier & Gur, 2007). Deficits have also been observed in the prison population and among people with antisocial/conduct disordered traits. In this case FER difficulty has been linked to lack of empathy and acts of violent behaviour towards others (van Goozen, Fairchild, Snoek, & Harold, 2007). Most commonly FER ability has been explored in people diagnosed with Borderline Personality Disorder (BPD). In a systematic review of this literature different patterns have been observed in the BPD population. For example, some studies have found that FER deficits are seen across all emotions, whereas other studies have found that FER

deficits are seen only in certain emotions i.e. fear, happiness, disgust (Domes, Schulze, & Herpertz, 2009). Other studies have found enhanced recognition of some emotions i.e. anger (Domes *et al.*, 2009) in persons with BPD. In addition, others have found that persons with BPD over-recognise certain emotions, such as anger, in neutral faces or rate mild displays of emotion as more intense. This effect has been found to be strongest when participants were experiencing emotional distress (Wagner & Linehan, 1999). In relation to other mental health difficulties more broadly, people with internalizing disorders, such as depression, have been found to exhibit deficits in perception of emotion in others (Stuhrmann, Suslow, & Dannlowski, 2011). Those with externalising difficulties have also been shown to exhibit poorer FER performance, particularly in recognising expressions of fear, sadness and disgust in others (Blair, Colledge, Murray, & Mitchell, 2001). Furthermore, impairments in facial emotion processing occur not only in those with mental health disorders, but have been found to occur in 'healthy' children and adults with a history of childhood maltreatment (Pollak, Cicchetti, Hornung, & Reed, 2000).

1.1.2 The link with childhood trauma

In many of the mental health conditions described above childhood maltreatment and/or adversity early in life is recognised as playing a causal role their development (Cicchetti & Valentino, 2006). Furthermore, it is widely recognised that experience of physical/sexual abuse and neglect in childhood can have serious negative consequences for social and emotional development (Luke & Banerjee, 2013). Throughout this thesis the terms childhood maltreatment and abuse are used interchangeably to mean any experience of physical, emotional and sexual abuse or physical/emotional neglect. The term childhood adversity is used to reflect broader challenging experiences including parental criminality, parental drug use, experience of state care, witnessing of domestic violence as well as abuse/neglect.

Young and Widom (2014) suggest that childhood abuse could affect emotion recognition in a number of different ways. For example, childhood maltreatment has been found to be linked to rejection by peers and to being judged as showing less positive and more negative behaviours (Anthonysamy & Zimmer-Gembeck, 2007). There is a developing evidence base that suggests

children who have experienced maltreatment may interpret interpersonal interactions in different ways to children who have not had these experiences (Luke & Banerjee, 2013). In a systematic review, Luke and Banerjee (2013), explored the relationship between maltreatment and social understanding in children. They identified a strong trend in the literature that linked maltreatment and poor social understanding. The concept of social understanding was defined as a combination of related but distinct skills that are involved in understanding and navigating the social world. This included FER. There are a number of psychological theories that could be used to explain a link between childhood maltreatment and difficulties with FER.

1.1.3 Theoretical understanding

Bandura's (1977) seminal Social Learning Theory might suggest that difficulties in facial emotion recognition may result from simple learning and imitation of behaviour modelled by adults central to the child's life (Bandura, 1977). Therefore, a child who experiences a parent who does not show a consistent and coherent pattern of emotion may not learn to know and imitate emotions in the same ways as a child that has more stable adult influence. However, other theories emphasise the role of the child in constructing their own understanding of the world. Children do this based on transactional relationships between the self and the environment (Vygotsky, 1966). Attachment theory develops this further, suggesting that children growing up with abuse or neglect are at risk for developing impoverished or distorted social understanding specifically due to the type of parenting they have experienced. This parenting fails to provide the requisite skills necessary for typical development (Crittenden & Ainsworth, 1989). In abusive families, inconsistency in parenting can make it difficult for children to interpret or predict their carers actions (Kim & Cicchetti, 2010). A distorted internal working model is likely to develop and be perpetuated into other social relationships. Maltreating families often display inconsistent or frightening emotional signals which may not reflect the child's own expressed emotions leading to difficulties in development of emotional understanding (Pollak, Messner, Kistler, & Cohn, 2009). Children who are maltreated are more likely to be insecurely attached (Kim & Cicchetti, 2010). Research by Howe (1999) suggests that 80% of this population could be categorised as

displaying disorganised attachments. This indicates they may have inaccurate representations of 'typical' relationships. Socialisation to emotions is likely to be less available to these people as they are developing (Luke & Banerjee 2013) meaning they are perhaps more likely to be impaired in FER. Whether this deficit continues into adulthood or whether people can learn the skill of emotion recognition as they age is undetermined.

Pollak (2008) explains how the atypical environment of a maltreating family could bias responses to certain emotional states. This hypothesis suggests that children with adverse experiences have difficulty processing emotions due to the alteration of sensory thresholds in response to early social experiences. For example, due to over exposure to such stimuli at a young age only extremes of emotion may elicit responses. In addition, early experiences may make some stimuli more salient, and developing perceptual systems become more sensitive to these stimuli. Young children have limited information-processing capacity available to them, meaning that attention is likely to be directed at the negatively-valanced emotional cues that are most helpful in predicting caregivers' behaviour (Pollak, Cicchetti, & Klorman, 1998). Sensitivity only to extreme negative emotions could be seen as an adaptive development for children experiencing abuse. However, as they mature these patterns may remain leading to difficulties in social situations.

1.1.4 Neurobiological explanations

Facial emotion recognition and understanding can be understood as a psychobiological process, which is modulated by different brain regions and neurocognitive systems (da Silva Ferreira, Crippa, & de Lima Osório, 2014). The processing of the six core emotions, happiness, sadness, anger, fear, disgust, and surprise; involves several cerebral areas. Imaging studies have shown activation in the amygdala and the prefrontal cortex in particular. People with early damage to prefrontal brain regions are often found to display greater levels of impulsive aggression alongside impairments in recognition of fear, anger and disgust (Fairchild, Van Goozen, Calder, Stollery, & Goodyer, 2009). In addition, amygdala responsiveness to emotional faces has been shown to be heightened in people with experience of sexual abuse and people with

internalizing conditions (van Hoof, van den Bulk, Rombouts, Rinne-Albers, van der Wee, van Ijzendoorn & Vermeiren, 2017). These identified brain areas typically mature as a child develops, leading to a greater refinement of emotional processing over time (Herba, Landau, Russell, Ecker, & Phillips, 2006). The recognition of expressions of emotion involves the interpretation of partial information based on the facial cues displayed. These cues are then used to generate a hypothesis concerning which emotion is being expressed. This is thought to then be categorised and used to predict other's behaviour (Pollak & Sinha, 2002). Recognition of emotion appears to involve neurobiological processes based on neural experiences and learning. FER ability is closely linked to intellectual ability, both skills are linked to neurological development as well as early learning experiences (Shenk, Putnam, & Noll, 2013). However, the distinct roles of innately predetermined ability and acquired experience in FER ability have not been fully explained. (da Silva Ferreira *et al*., 2014).

1.1.5 Adults and FER

Aspects of social understanding in the maltreated population of children have been more comprehensively explored (e.g. Luke & Banerjee, 2013; da Silva Ferreira *et al*., 2014; Smetana & Kelly, 1989). Furthermore, there have been reviews of the literature exploring the link between emotion recognition and Borderline Personality Disorder (Domes *et al*., 2009; Mitchell, Dickens, & Picchioni, 2014). However, there has, as yet, been no systematic review of the literature exploring the link between experience of maltreatment in childhood and emotion recognition in adults. This is an important avenue of exploration because it is known that developmentally, children who are exposed to a wide variety of social situations will develop new responses and adjust their interpretation of emotion accordingly (Pollak *et al*., 1998). Yet conversely, for the maltreated child previously acquired understanding can become rigid as they age (Sidebotham, Heron, & Golding, 2002). The diversity of social situations that this group are exposed to may be restricted for several reasons, such as the family's reduced social circle and the interaction with deviant peers. This may continue through life; meaning emotion recognition deficits may remain into adulthood (Sidebotham *et al*., 2002).

1.1.6 Review aim and questions

The purpose of the present review is to evaluate the evidence for the hypothesis that maltreatment or adversity in childhood is linked to performance in facial emotion recognition. More specifically the review had three key questions:

1. Is there a link between childhood maltreatment/adversity and facial emotion recognition in adults?

2. Are specific emotions more or less likely to be accurately recognised by adults who experienced early adversity/maltreatment?

3. Does type of abuse/adversity impact facial emotion recognition differently?

It is important to note that although these are the questions to be answered by the review, the proposed responsibility for any detrimental effects is not thought to solely lie in the physical acts of abuse or neglect themselves. Developmental effects of maltreatment are recognised as being intertwined in the wider context of the person's relationship with their parents/carers, socio-economic factors and environment (Wolfe & Jaffe, 1991).

1.2 Method

This systematic review was designed and reported according to the PRISMA statement, a 27-item method that is internationally recognized ensuring the highest standard in systematic reviewing (Moher, Liberati, Tetzlaff, Altman, & PRISMA Group, 2009). This review can be said to be in line with most of the PRISMA guidance; however, the review was conducted by one researcher.

1.2.1 Search strategy

Three electronic search databases were used to conduct a systematic search: Medline (through EBSCO), PsychInfo (through EBSCO), and Web of Science. The search took place on 12th January 2018 and no time limitations were applied to ensure a wide range of literature was captured.

1.2.2 Search terms

Table 1.1 outlines the search terms used to identify potential studies. The keywords were chosen to be as sensitive as possible to enable the capture of all relevant literature. The first set of keywords aimed to identify literature on emotion recognition; the second set of keywords focused on childhood trauma and maltreatment; the third set aimed to limit the search to just literature in the adult population. These sets of keywords were entered into the search databases separately and then combined using the Boolean operator AND. Two exclusion criteria were added using the Boolean operator NOT. This was because scoping searches revealed these words were frequently associated with some of the other search terms yet were not relevant (i.e. brain injury and substance use). Only English language articles or papers translated to English were included.

Table 1.1

Specification of Search Parameters

Operator	**Definition**
# 1 Keywords	"emotion recognition" OR "face emotion recognition" OR "facial emotion recognition" OR "emotion recognition dysfunction" OR "face perception" OR "facial expression" OR "facial expression recognition" OR "emotional understanding" OR "facial emotion expression" OR "facial affect" OR "affect perception"
# 2 Keywords	trauma* OR maltreat* OR "sexual abuse" OR "physical abuse" OR neglect* OR "emotional abuse" OR "emotional neglect" OR abuse* OR abusive OR "PTSD" OR "historic abuse" OR history OR "post-traumatic stress" OR rape OR molest* OR advers*
# 3 Keywords	adult* OR adulthood OR "over 16" OR men OR women
# 4 Keywords	substance OR "brain injury"
# 4 Boolean operator	#1 AND #2 AND #3 NOT #4
# 5 Limits language	English language
#6 Limits Date	None
# 7 Limits kind of studies	classical article OR comparative study OR evaluation studies OR journal article OR review NOT thesis
# 8 Limits subjects of studies	(male OR female) AND (humans)
# 9 Boolean operator	#4 AND #5 AND #6 AND #7 AND #8
# 10 Selection	Removal of duplicates and manual exclusion of articles not meeting criteria

1.2.3 Eligibility criteria

The articles retrieved by the searches were assessed in line with the predetermined eligibility criteria (See Table 1.2). Papers were eligible if they were written in English (or were already translated). All forms of study design were eligible as no review of this literature has been conducted before. Studies were included if they had a measure of childhood traumatic experiences which may include childhood maltreatment or adversity. A measure of facial emotion recognition was a requirement but no single test or method of measurement was specified. Participants had to be adults or if children were included then the results must be possible to view by age so only results for adult participants could be extracted. Adulthood was defined as anyone being over the age of 16 years old (WHO, 1992). Both clinical and non-clinical populations were included.

Table 1.2

Eligibility criteria for studies included in the review

Inclusion Criteria	**Exclusion Criteria**
- Written in or translated to English - Participants were adults aged 16 years or over. - Measure of trauma that included childhood maltreatment or adversity. - Measure of facial emotion recognition included. - Relationship between childhood trauma and facial emotion recognition explored by study.	- Translated article unavailable - Unpublished research - Single case studies - Participants exclusively under 16 years of age. - No measure of childhood trauma and/or emotion recognition. - Other forms of trauma i.e. trauma as a consequence of genocide or war. - Participants with traumatic brain injury. - Non-human sample

1.2.4 Data selection

Figure 1. displays the data selection process in line with PRISMA guidelines (Moher *et al.*, 2009). The three searches yielded 821 records, 332 of which were duplicates. The remaining 492 articles were screened by reading the titles and abstracts, 386 articles were removed during this process as they did not meet eligibility criteria. The remaining 106 articles were full-text reviewed. Under further scrutiny 86 papers were removed as they did not closely meet the eligibility criteria. Several articles were found not to have a measure of childhood maltreatment/ abuse/ adversity (n=27). A further group did not meet criteria for having an adult aged sample or sample including adults where results could be extracted for adults alone (n=19). In some of the excluded articles a measure of facial emotion recognition was not present (n=18). In addition, there were many papers that did not include analysis of the relationship between childhood trauma and emotion recognition (n=26). Three additional papers were identified via a citation search of the included articles reference lists. A sample total of 16 articles were found eligible for review.

1.2.5 Quality assessment

The final studies selected for review were assessed for methodological quality using quality assessment tools. The tools selected were from the The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses (Wells, Shea, O'Connell, Peterson, Welch, Losos & Tugwell, 2009) (tool detailed in Appendix 1.1). This selection of tools was created to enable the assessment of case control and cohort studies. A study is judged on three broad perspectives: the selection of the study groups; the comparability of the groups; and the ascertainment of either the exposure or outcome of interest for case-control or cohort studies respectively (Wells *et al.*, 2009). Most of the articles identified for this review were case control studies, however; there were also a few cohort studies. Therefore, it was important to be able to assess different study designs but for the finding to be at least broadly comparable.

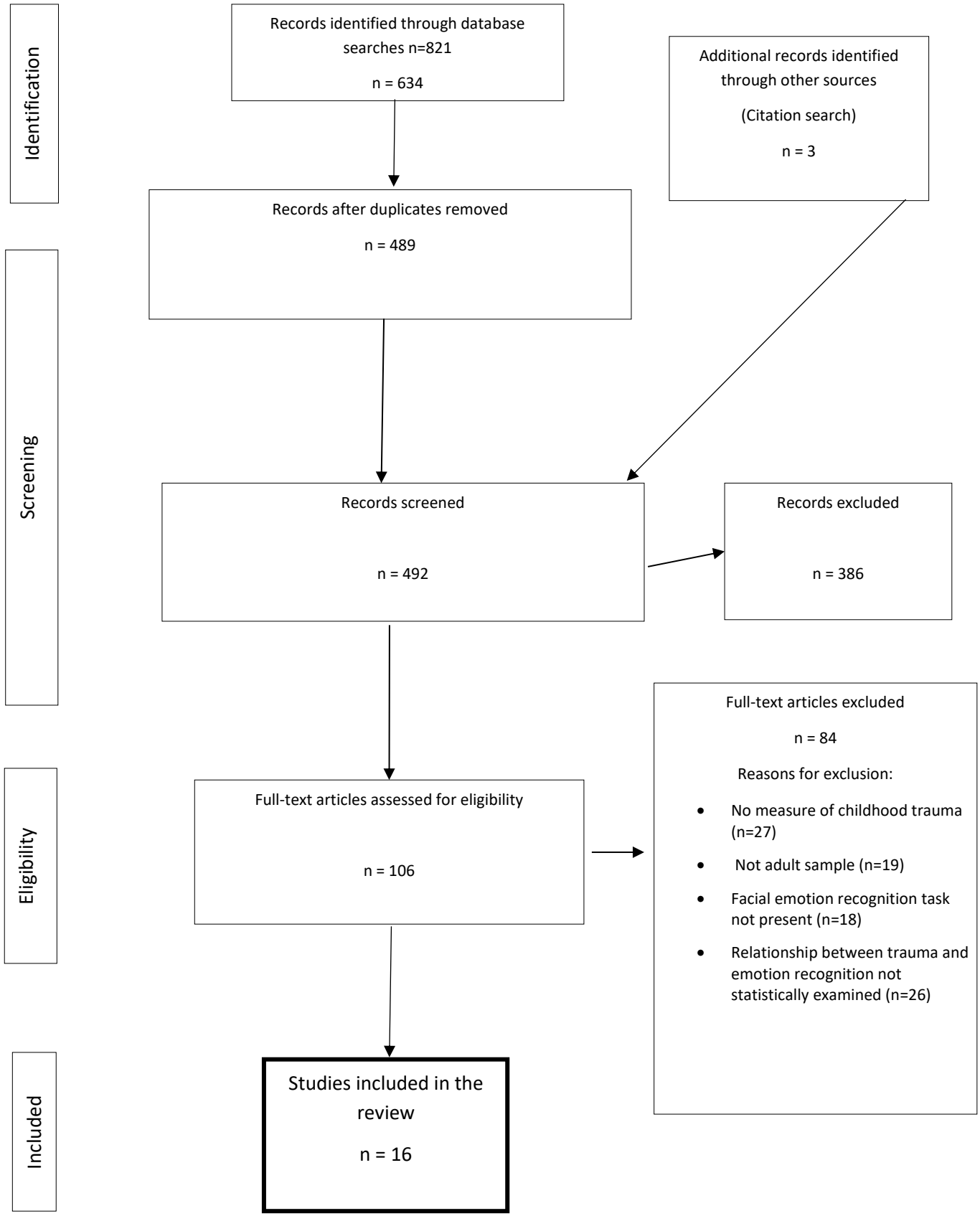
1.2.6 Effect Size

Whilst a meta-analysis of studies in this review was not possible due to the differences in study design, participant groups and range of measures used; where possible effect sizes have

been extracted or calculated using available data. This enables a more detailed analysis of the literature and provides further information about the strength of the effect that childhood adversity has upon facial emotion recognition. Due to differences in statistical methodologies for some studies Cohen's *d* has been reported for other studies the correlation coefficient *r,* or Eta-squared ($\eta 2$) were used. In some cases, there was insufficient information available to calculate effect sizes.

Figure 1.1

Flow diagram of study selection



1.3 Results

1.3.1 Study design

Of the 16 studies identified by the search all were quantitative (Outlined in Table 1.3). Three different methodologies have been used cross-sectional case control study (*n*=10), cross-sectional study (*n*=5) and prospective cohort study (*n*=1).

1.3.2 Sample characteristics

All studies included in the review had participants who were adults (aged 16-99 years old). The sample sizes ranged from 26 – 5559. Other study sample characteristics varied widely, borderline personality disorder was the most commonly observed key characteristic with eight studies using participants diagnosed as having BPD. Other main features of the samples included childhood trauma only (*n*=3), Schizophrenia (*n*=1), Dissociative seizures (*n*=1), Bipolar disorder (*n*=1), Depression (*n*=1), general population (*n*=1), university students (*n*=1). The control groups used in the case control designs varied, including healthy controls with no current mental health condition (*n*=7), no experience of childhood trauma (*n*=1), age matched (*n*=1), age, sex, race matched (*n*=1), age, sex, level of education matched (*n*=1). No control group was included in *n*=4 of the studies reviewed.

The mean age of the participants ranged from 19.24 to 47.5 years. The majority of the participants were female and four studies used solely female samples. In the studies including both males and females, the proportion of males ranged from 10% to 55%. Recruitment for the studies again was varied; four studies recruited from inpatient psychiatric populations, three from outpatients of psychiatric services, one from mother and baby mental health services, three from advertising to the general population, one via online study, one university students gaining course credit and two used pre-existing datasets. The location in which the studies were conducted was mainly in European countries (*n*=9) the remaining studies were conducted in the USA (*n*=5), Australia (*n*=1) and one study recruited from multiple western countries (USA, UK, Australia, New Zealand).

Table 1.3*: Data extraction*

Authors	Design and aims	Sample size and characteristics	Trauma measure	Emotion recognition measure	Key findings (effect size)	Quality Assessment
1. Aas, Kauppi, Brandt, Tesli, Kaufman, Steen, Agartz, Westlye, Andreassen & Melle (2017)	Correlational design. Relevant aim of study was to investigate whether high levels of childhood trauma were related to rating negative faces (anger/fear) more negatively and positive faces (happiness) less positively in patients with psychotic disorders.	*n*=101 patients with schizophrenia spectrum or bipolar spectrum disorders	Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998)	The participants were instructed to assess the facial expressions on a laptop monitor, by rating the images from 1 to 9 based on how negative/positive they were	Participants with high levels of childhood trauma identified negative emotions as more negative (*d* >.42). Schizophrenia spectrum patients rated negative emotion images more negatively than low trauma patients (*d*=.8). They also rated positive emotions as less positive (*d* = .2). No significant associations were found for the bipolar group.	Selection - *** Comparability – Exposure – N/A Outcome - *
2. Veague & Hooley, 2014	Case control correlational design. Aim to assess the role of childhood trauma and BPD in the recognition emotion.	*n*=44 Participants (*n*=15 Borderline (BPD) *n*=15 Control	Childhood Maltreatment Interview Schedule(CMIS; Briere 1992).	Task 1. Participants identified discrete emotional states at different levels of intensity. Two faces (one male and one female) were selected from the	BPD symptoms were associated with lower threshold for recognition of anger in male faces but abuse history was not *(d* = .5)	Selection - * Comparability - * Exposure - * Outcome - N/A

Authors	Design and aims	Sample size and characteristics	Trauma measure	Emotion recognition measure	Key findings (effect size)	Quality Assessment
		n=14 Childhood trauma without BPD)		Ekman and Friesen(1976) series. Task 2. detected the threshold for identifying emotions by asking participants to increase the intensity of emotion shown on a picture until they could decode it.	Abuse history predicted problems with happiness recognition.	
3. Dyck, Habel, Slodczyk, Schlummer, Backes, Scheinder & Reske (2009)	Case control correlational design. Relevant aim: to assess the role of PTSD symptoms in emotion rapid emotion discrimination and recognition in a sample of BPD patients and contols	*n*=38 Participants (*n*=19 BPD patients and *n*=19 healthy controls)	Structured Clinical Interview for DSM-IV Axis-1 disorders (SCID-I; Fydrich *et al.*, 1997) PTSD from childhood assessed. Type of experience not reported.	Fast Discrimination of Negative and Neutral Faces Test (FAN test) Gur *et al*., 2002. (Shows anger fear and neutral.) The Emotion Recognition test (ER) Kohler *et al*., 2014 (shows four emotions anger fear happy and sad).	PTSD symptoms in a group of BPD patients were significantly related to response accuracy in the FAN test. (Insufficient information to compute effect size*)* No other significant relationships including PTSD were identified.	Selection - *** Comparability - * Exposure - * Outcome - N/A
4. Elliot, Campbell, Meville, McCabe, Newman &	Case control correlational design. Relevant aim: to assess the role of childhood	*n*=26 participants (*n*=13 mothers with BPD and	Childhood Trauma Questionnaire (CTQ;	Infant-face stimuli consisted of 30 images of male and female infant faces. 15 images	No significant correlations were found between childhood trauma and infant emotion recognition.	Selection - *** Comparability - Exposure - ** Outcome - N/A

Authors		Design and aims	Sample size and characteristics	Trauma measure	Emotion recognition measure	Key findings (effect size)	Quality Assessment
	Loughland (2014)	trauma on emotion recognition of infants in a group of mothers with BPD and health control mothers	*n*=13 health control mothers)	Bernstein & Fink, 1998)	were of the participant's own infant and 15 were of unknown infants (five happy, five sad, and five neutral images)		
5.	Fertuck, Jekal, Song, Wyman, Morris, Wilson, Brodsky & Stanley (2009)	Case control correlational design. Relevant aim: To assess the role of childhood trauma in the recognition of emotion from the eyes among BPD patients.	*n*=55 participants (*n*=30 BPD patients and *n*=25 healthy controls)	Self report	Reading the Mind in the Eyes Test' (RMET) Baron-Cohen *et al.* (2001)	Experience of abuse in childhood was not significantly associated with RMET total RMET negative emotions or RMET neutral.	Selection - *** Comparability - * Exposure - ** Outcome - N/A
6.	Germine, Dunn, McLaughlin & Smoller (2015)	Cross-sectional correlational design. Relevant aims: To assess the role of specific forms of childhood adversity on emotional discrimination and ability in the	*n*=5559, in total recruited online. *n*=1504, completed the facial emotion discrimination task. *n*=2242, completed the mental state inferencing task.	Adverse Childhood Experiences Scale (ACE; Felitti *et al.*, 1998) Conflict Tactics Scale (CT; Straus 1979) and	Reading the Mind in the Eyes Test' (RMET) Baron-Cohen *et al.*, (2001) used to measure mental state inferencing. Emotion subtest of the Queen Square Face Discrimination Test	Types of adverse experience were grouped using PCA. Parental Maltreatment (Physical, verbal abuse & threats etc) ($\eta 2$=-0.06), Parental maladjustment (domestic violence, criminality divorce	Selection - *** Comparability -** Exposure – N/A Outcome - *

Authors	Design and aims	Sample size and characteristics	Trauma measure	Emotion recognition measure	Key findings (effect size)	Quality Assessment
	RMET (Baron-Cohen *et al*., 2001)		Composite International Diagnostic Interview (CIDI; Kessler & Ustan, 2004)	(QFDT emotion; Garido *et al*., 2009) used to measure facial emotion discrimination.	substance use etc) (η2=-.08)and Sexual abuse/institutional care (η2=.05)were significantly negatively associated with reduced mental state inferencing. Only the specific variables of foster care(*d*=.4), verbal abuse (*d*=.1) and physical abuse with injury (*d*=.2) were significantly negatively associated with emotion discrimination.	
7. Gibb, Scofield and Coles (2009)	Correlational design. Relevant aim: To examine the relations between young adults' reports of childhood abuse and their	*n*=217 undergraduate students	Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998)	Images of facial expressions were taken from a standardized stimulus set (Matsumoto & Ekman, 1988). Emotions were shown at different intensities participants were asked to identify which	Participants reporting past abuse were significantly more likely to endorse faces in the 20% to 40% intensity range as being angry, *r* = .19.	Selection - ** Comparability - Exposure – N/A Outcome - *

Authors	Design and aims	Sample size and characteristics	Trauma measure	Emotion recognition measure	Key findings (effect size)	Quality Assessment
	interpretation biases for facial displays of emotion			emotion they were seeing (happy, sad, angry)		
8. Lieslehto *et al*., 2017	Correlational design. Relevant aim: to assess the role of childhood trauma on recognition of facial emotions.	*n*=104 young adults.	Trauma and Distress Scale (TADS) questionnaire (Patterson *et al.*, 2002).	Measure developed for the study showing faces with different emotions at different intensities	There was a negative correlation between TADS scores and the recognition of fearful facial expression (insufficient information available to calculate effect size)	Selection - Comparability - Exposure – N/A Outcome -
9. Lowyck, Lutyen, Vanwalleghe m, Vermote, Mayes &Crowley (2016)	Case control correlational design. Relevant aim: To explore the role of trauma in emotion recognition among BPD patients.	*n*=44 (*n*=22 BPD patients and *n*=22 healthy controls)	Childhood Trauma Questionnaire (CTQ; Bernstein & Fink,1998)	The dynamically changing face recognition task was developed using FaceMorph six basic emotions (fear, sadness, disgust, happiness, anger, and surprise) were morphed by 2% steps of intensity from 0% to 100% intensity Participants press a stop button as soon as they recognized an emotion. They were then asked	Total childhood trauma was negatively related to the number of correct responses to the emotions (*r*=-.69). There was no effect of type of trauma on recognition accuracy.	Selection - ** Comparability - * Exposure - *** Outcome - N/A

Authors	Design and aims	Sample size and characteristics	Trauma measure	Emotion recognition measure	Key findings (effect size)	Quality Assessment
				to make a forced choice between the six emotions		
10. Nicol, Pope, & Hall, 2014	Case control correlational design. Aim: To investigate the relationship between borderline personality disorder (BPD) and child hood adversity using photographs of emotional faces	*n*=43 (*n*=22 BPD outpatients, *n*=21 healthy controls)	Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998)	The Ekman 60 Faces test (Young *et al*., 2010), in which one of six emotions was identified from each photograph.	Poorer performance on the Ekman test was associated with higher CTQ scores (*r*=-.48). Specifically, physical abuse (*r*=-.49) and emotional abuse (*r*=-.48) were associated with poorer performance. Disgust was the only specific emotion that correlated with CTQ score (*r*=-.47)	Selection - * Comparability - Exposure - *** Outcome - N/A
11. Pick, Mellers, & Goldstein, 2016	Case control correlational design. Relevant aim: To explore the relationship between trauma and emotion recognition in people with	*n*=83 (*n*=40 patients with dissociative seizures; *n*=43 controls)	The Traumatic Experiences Checklist (TEC; Nijenhuis *et al.,* 1999)	Face stimuli were taken from Ekman & Freisen (1976) Pictures of facial affect series and were presented on computer. Participants had to choose which emotion was shown and rate its intensity.	TEC scores were negatively correlated with accuracy for identifying neutral faces (*r*=-.49) in people with dissociative seizures. No other relationships with TEC score were identified.	Selection - * Comparability - * Exposure - ** Outcome - N/A

Authors	Design and aims	Sample size and characteristics	Trauma measure	Emotion recognition measure	Key findings (effect size)	Quality Assessment
	dissociative seizures.					
12. Preißler, Dziobek, Ritter, Heekeren & Roepke (2010)	Case control correlational design Relevant aims: To explore the relationships between trauma experience and social cognition in persons with BPD using two different tests.	*n*=102 (*n*=64 BPD patients; *n*=38 healthy controls)	The Post-traumatic Stress Diagnostic Scale (PDS; Foa, 1995) does not distinguish childhood vs adult trauma.	Reading the Mind in the Eyes Test' (RMET; Baron-Cohen *et al.,* 2001) was used as a simple measure of emotion recognition. The Movie For the Assessment of Social Cognition (MASC; Dziobek *et al*., 2006) was used to assess social cognition more dynamically emotion recognition was one element of this.	Participants with BPD and PTSD were found to show deficits on the emotion recognition element of the MASC (*d*=.45) but not on the RMET. The authors conclude that BPD patients with trauma show particular difficulty with more complex social cognition tasks.	Selection - **** Comparability - Exposure - ** Outcome - N/A
13. Russo, Mahon, Shanahan, Solon, Ramjas, Turpin & Burdick (2015)	Cross-sectional correlational design. Relevant aim: To explore the relationship between childhood abuse and emotion recognition in people with Bipolar Disorder.	*n*=75 patients with Bipolar Disorder (BP) currently affectively stable	Childhood Trauma Questionnaire (CTQ; Bernstein & Fink,1998)	The Emotion Recognition Task (ERT) taken from the Cambridge Neuro-psychological Test Automated Battery (CANTAB; Robbinsetal.,1994) is a computer-generated paradigm for the	Patients with BP performed worse on the ERT only when childhood trauma was considered. Emotional neglect had a negative effect overall (*d*=.67). Physical abuse (*d*=.62), emotional (*d*=.76) neglect and physical	Selection - *** Comparability - ** Exposure – N/A Outcome - *

Authors	Design and aims	Sample size and characteristics	Trauma measure	Emotion recognition measure	Key findings (effect size)	Quality Assessment
				recognition of six basic facial emotional expressions.	neglect (*d*=.49) were all also related to poorer performance in recognising anger.	
14. Suzuki, Poon, Kumari & Cleare (2015)	Cross-sectional case control design. Aim: to examine interactive effects of childhood maltreatment and depression on both speed and accuracy of facial emotion recognition	*n*=76 (*n*=36 patients with depression; *n*=40 healthy controls)	Childhood Trauma Questionnaire (CTQ; Bernstein & Fink, 1998)	A computerized facial emotion recognition task. The task consisted of 100 pictures expressing happy, sad, neutral, fearful, and angry emotions. Stimuli were selected from gradually morphed Ekman faces (Ekman & Friesen, 1976)	Three-way interaction between childhood maltreatment, depression, and emotion type on emotional processing (*d*=.41), specifically on errors in identifying emotion. Post hoc analyses of this revealed healthy abused individuals had more errors on fearful faces than angry faces. Emotional abuse correlated positively with both the accuracy and the speed of fear recognition, while Physical abuse correlated	Selection - *** Comparability - * Exposure - ** Outcome - N/A

Authors	Design and aims	Sample size and characteristics	Trauma measure	Emotion recognition measure	Key findings (effect size)	Quality Assessment
					the speed of anger recognition, in abused healthy individuals.	
15. Wagner & Linehan (1999)	Cross-sectional case control design. Aim: To compare facial emotion recognition ability in a group of women with BPD compared to women with a history of trauma without BPD.	(*n*=62) *n*=21 women with BPD and sexual abuse; *n*=21 women with history of childhood sexual abuse; *n*=20 health controls with no abuse history.	Childhood Maltreatment Interview Schedule (Briere, 1992)	Japanese and Caucasian facial expressions of emotion (Ekman & Matsumoto, 1992)	The BPD group were more accurate in recognising fear than the abused group and controls (*d*=.59;*d*=.55). The abuse group showed more accuracy in recognition of happy faces than BPD and control (*d*=.77; *d*=.57). BPD and abuse groups scores lower on recognition of neutral faces (*d*=.61;*d*=.64).	Selection - **** Comparability - * Exposure - ** Outcome - N/A
16. Young & Widom (2014)	Prospective cohort design. To assess whether children with documented cases of abuse were impaired in emotion processing when followed up	*n*=547 (abuse/neglect *n*=295; control *n*=253)	Court substantiated cased of childhood physical/sexual abuse and neglect.	International Affective Picture System. (IAPS; Lang, Bradley, & Cuthbert, 2005)	Childhood abuse negatively predicted overall recognition accuracy (η2= −.11). Neglect alone also negatively predicted accuracy (η2=-0.1) however	Selection - **** Comparability - ** Exposure – N/A Outcome - ***

Authors	Design and aims	Sample size and characteristics	Trauma measure	Emotion recognition measure	Key findings (effect size)	Quality Assessment
	into adulthood and compared to non-abused matched controls.				physical and sexual abuse did not. Abuse and neglect predicted positive emotion recognition and neutral recognition(η2=-.13; η2=-.13) but not negative emotion recognition. Sexual abuse predicted poorer performance on positive emotion recognition (η2=-.13).	

1.3.3 Measures

Table 1.3 details the measures used in each study.

Childhood trauma/adversity: Childhood trauma is measured using twelve different measures some of which are well validated (*n*=10) others were based on un-validated self-report questions (*n*=1). Some measures did not distinguish between experience of childhood and adult experiences of trauma (*n*=2). One study relied on court records of childhood abuse taken when the participants were children. The most used measure was the Childhood Trauma Questionnaire (Berstien & Fink, 1998) (*n*=7). The CTQ is a measure with strong psychometric properties (Scher, Stein, Asmundson, McCreary, & Forde, 2001). Other well validated measures included the Adverse Childhood Experiences Scale (ACE) (Felitti *et al*., 1998) (*n*=1) and the Childhood Maltreatment Interview Schedule (CMIS) (Briere, 1992) (*n*=1). Other measures explored trauma across the lifespan such as the Trauma and Distress Scale (TADS)(Patterson, 2002) (*n*=1) and the Traumatic Experiences Checklist (Nijenhuis, Hart, & Kruger, 2002). Some of the studies used measures of Post-Traumatic Stress Disorder symptomology to assess trauma. For example, the Post-Traumatic Stress Diagnostic Scale (PDS) (Foa, Cashman, Jaycox, & Perry, 1997) (*n*=1); the PTSD section of the Structured Clinical Interview for DSM-IV Axis 1 disorders (SCID-1) (Fydrich, 1997) (*n*=1); the Composite International Diagnostic Interview (CIDI) (Kessler & Ustün, 2004) (*n*=1). All but one study used a form of retrospective self-report measure of traumatic experiences in early life. Young & Widom (2014) used court substantiated cases of childhood physical/sexual abuse and neglect processed by from 1967-1971 in family or criminal courts in a Midwestern area of the United States. With the exception of Young & Widom (2014), all the other studies administered the measure of trauma at the same time point as the other measures used in the study. All but one study explored child maltreatment using measure assessing only physical, emotional, sexual abuse and neglect. The other study explored adversity more broadly including divorce, criminality, domestic abuse and parental drug/alcohol use misuse in addition to maltreatment.

Facial Emotion Recognition: Measurement of facial emotion recognition was varied as there are few validated measures of this skill. Many of the studies used more than one measure of emotion recognition to measure different aspects of this ability, such as speed and recognition of different intensities. In total nineteen measures of FER were used. Most commonly (n=8) the studies used a form of computer based task using the Ekman and Friesen (1976) Pictures of Facial Affect (POFA) series of images. These images were used in three different ways by the studies 1. To get participants to identify the emotions presents (n=8); 2. To rate the intensity of emotions presented (n=1); 3. To increase the intensity of emotion presented to a level where it could be detected (n=1). The emotions that were assessed using this measure were Happiness, Sadness, Anger, Fear, Disgust and Surprise. Although some studies (n=4) only used a subset of these emotions i.e. Happiness, Sadness, Fear and Anger or only the 'negative emotions'; Anger, Fear, Disgust and Sadness. The Ekman and Friesen POFA series is very well a validated set of images that has been used to reliably predict emotion recognition and has been adapted to be used across cultures (Ekman & Friesen, 1976, 2003).

The Reading the Mind in the Eyes Test (RMET) (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001) was the second most used method of testing FER ability (n=3). This test uses images of emotion expressed only through the eyes and requires participants to identify that emotion using multiple choice options.

Other measures that assessed simple emotion recognition included the Emotion Recognition Test (ERT) (Kohler *et al*., 2014) (n=2); The Queen Square Face Discrimination Test (QFDT) (Germine & Hooker, 2011) (n=1); The emotion recognition task from the Cambridge Neuropsychological Test Automated Battery (CANTAB) (Robbins *et al*., 1994); the International Affective Picture System (IAPS) (Lang, Bradley & Cuthbert, 2005) (n=1). One study use the Fast Discrimination of Negative and Neutral Faces test (FAN) (Gur *et al*., 2002). This test assessed speed of discrimination.

One study (Preissler, Dziobek, Ritter, Heekeren, & Roepke, 2010) used the Movie For the Assessment of Social Cognition (MASC) (Dziobek *et al*., 2006). The task requires participants to

watch a film and answer questions on social cognition at certain points. One element of this assessment included emotion recognition. Finally, Elliot, Campbell, Mcville, McCabe, Newman and Loughland (2014) used an idiosyncratic measure developed to specifically assess mothers' ability to identify emotion in their own and other infants.

1.3.4 Quality assessment

The final articles that were selected for systematic review were assessed using the Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies in meta-analyses (Wells *et al.,* 2009). This measure has two assessment tools one for case control studies and one for cohort studies. The tools rate studies on the areas of Participant Selection, Comparability and Exposure/Outcome. It is possible to achieve up to four stars for Selection, two stars for Comparability and four stars for Exposure/Outcome. The case control quality tool assesses exposure; meaning how participants are assessed on the dependent variable, response rate for the two groups and checking if measurement was the same for the two groups. The cohort study quality tool assesses outcome, meaning it explores how outcome was assessed, follow up period and dropout rates for those exposed to trauma and those not exposed. The results of the quality assessment can be found in Table 1.3 and detail of the quality assessment process can be found in Appendix 1.2.

Two studies scored the maximum number of stars for selection. One of these was a case control design and the other a cohort study (Preissler *et al*., 2010; Young & Widom, 2014) . Both had strongly representative samples that were independently validated as having childhood trauma. The controls or non-exposed individuals were matched to the exposed sample/cohort. Structured interviews or secure records were used to assess exposure to maltreatment. Controls were checked to ensure no history of trauma and in the case of Young and Widom (2014) the dependent variable was demonstrated to occur subsequent to the childhood trauma.

Three studies were identified as scoring the maximum number of stars for comparability (Germine, Dunn, McLaughlin, & Smoller, 2015; Russo *et al*., 2015; Young & Widom, 2014). These studies controlled for the key possible confounding variable (IQ) and at least one other

possible confounder (e.g.sex, age, education, mental health status). No study achieved maximum stars for exposure/outcome. This was because no study used secure records for assessment of the outcome variable. All but one study was cross-sectional in design, therefore, assessments were all completed at the same time. No studies except Young and Widom (2014) used blind assessors due to their cross-sectional design and the use of self-report measures. One study achieved no stars at all, indicating a high level of variability in the quality of studies identified for review. Table 1.4 provides the mean scores on the three areas. The mean number of stars shows that, on average, the studies reviewed were of low to medium quality with only a few exceptions. It is important to note that the NOS measure (Wells *et al.*, 2009) was not designed specifically for cross-sectional studies.

Table 1.4.

Mean Scores on the NOS quality measure

Newcastle Ottowa Scale Subscale	**Maximum number of stars available**	**Mean number of stars in review studies**
Selection	4	2.44
Comparability	2	0.81
Exposure	4	2.88
Outcome	4	1.17

1.3.5 The relationship between childhood trauma and FER.

In relation to the main review question, 'Is there a link between experience of childhood maltreatment and emotion recognition in adults?', the studies reviewed indicated that there was. Fourteen studies found significant relationships between measures of childhood maltreatment and performance on facial emotion recognition tasks. More specifically all fourteen studies showed that childhood maltreatment was negatively related to performance on FER tasks. Two studies

found no relationship between childhood trauma and FER ability (Elliot *et al*., 2014; Fertuck *et al*., 2016).

1.3.6 Type of emotion

Several studies explored the link between maltreatment and specific emotions (*n*=10). Abuse history was linked to worse identification of fearful (*n*=3), disgusted (*n*=1) and angry (*n*=1) faces compared to controls or non-exposed individuals. In addition, abuse was linked to poorer performance on positive emotion recognition (*n*=1). Some studies identified increased FER performance for specific emotions (*n*=4). Abuse history was linked to increased accuracy in recognition of anger (*n*=2), fear (*n*=1), happiness (*n*=1) and recognition of positive emotion (*n*=1). When misidentification information and/or the use of neutral faces was included in a study (*n*=4), abuse history was linked to identification of neutral faces as angry (*n*=2). Childhood trauma was related to misidentification of neutral faces (*n*=3). No relationship between maltreatment and speed of emotion recognition was identified, although, only two studies explored this.

1.3.7 Type of abuse

The impact of specific types of maltreatment was explored in five studies the results were quite varied. One study found that neglect alone negatively predicted FER accuracy but physical and sexual abuse did not. Physical abuse (*n*=2), emotional abuse (*n*=1) and neglect (*n*=2) negatively predicted emotion recognition. Sexual abuse predicted poorer positive emotion recognition (*n*=1). In another study adverse experiences were grouped. Parental maltreatment including physical and verbal abuse; parental maladjustment including domestic violence, criminality, divorce and substance use; sexual abuse and institutional care were all negatively associated with mental state inferencing. Specifically, foster care, verbal abuse and physical abuse were associated with poor FER. Emotional and physical neglect were related to poorer recognition of anger (*n*=1) but the opposite was found in another article (*n*=1).

1.3.8 Effect sizes

Effect sizes, where available or where it was possible to calculate them, are reported in Table 1.3. Due to the range of specific findings in relation to maltreatment and FER skill, it is difficult to group effects in a meaningful way. Differences in statistical analyses have meant that not all effect sizes are comparable. However, in relation to the main review question regarding the link between maltreatment/adversity and FER ability, the effect size was available for nine studies. The effect sizes were reported using a range of different methods. The majority of the reported effect sizes fall within the small to medium range. Many of the studies did not report all findings in relation to child maltreatment and FER ability. Non-significant results appeared to often be omitted.

1.3.9 The effect of mental health

Although the aim of this review was not to assess the role of mental health on FER ability, most of the studies reviewed here focused on a specific population of people with a particular mental health difficulty (n=12). In several cases, the assessment of childhood trauma and its link to FER was not the main aim of the study (n=8). This meant that of results relating to this were often not prioritised and non-significant results not reported. A separate review would need to be carried out to assess the role of specific mental health conditions on FER. However, the range of mental health conditions explored in these studies is large. These conditions could have a range of different effects on the individual and their ability to recognise emotion.

1.3.10 Summary of findings

In summary, the sixteen articles assessed by this systematic review identified a negative relationship between childhood adversity and facial emotion recognition, only two studies found no evidence of a relationship. Where it was possible to identify effect size a small to medium effect size was observed in most cases. The review identified a range of specific emotions that were particularly likely to be linked to childhood maltreatment including fear, anger and disgust. However, some studies found that maltreatment was linked to improved recognition of certain emotions such as anger, fear and happiness. Specific forms of maltreatment/adversity were linked

to poorer emotion recognition for example physical abuse, foster care experience, neglect and sexual abuse. Certain forms of maltreatment were also associated with improved performance in recognition of specific emotions such as physical abuse and anger. The results exploring specific emotions and forms of abuse were varied. Neutral faces were misidentified as displaying emotion in some studies, most commonly anger. The quality of the studies reviewed was similarly varied. A wide range of measures of child maltreatment/adversity were used, the Childhood Trauma Questionnaire (CTQ) was most common. In addition, the measures of facial emotion recognition ability were similarly varied. However, most studies used the Ekman and Friesen (1976) Pictures of Facial Affect (POFA) series which were then used in several different ways to create computer based programmes that assess aspects of FER ability.

1.4 Discussion

1.4.1 Main findings

This review focused the role of childhood experience of maltreatment and/or adversity on facial emotion recognition ability in adults. Specifically, it aimed to explore whether there was a relationship between the two variables (adversity and FER ability). If a relationship was identified the review aimed to assess what could it reveal about the impact of childhood adversity on a key skill for social interaction (Jovev *et al*., 2012). In addition, the review aimed to explore differential effects of different forms of maltreatment/adversity and the impact on recognition of certain emotions. A broad literature review following PRISMA guidelines (Moher *et al.,* 2009) identified only sixteen quantitative papers on this subject. These studies were reviewed and subjected to quality assessment (NOS; Wells *et al.,* 2009).

1.4.2 The relationship between adversity and FER ability

A pattern of results emerged from the review indicating a relationship between experience of childhood maltreatment/adversity and poorer facial emotion recognition ability in adults. The vast majority of the studies included in the review found a negative association between the two variables. Many of the studies used a case control design to compare the performance of those who had experienced abuse or adversity to controls who had not. In these studies, the majority

revealed a difference in FER ability with controls performing better than the maltreated groups. This main effect of early traumatic experience remained when, in the case of some studies, important confounding variables such as IQ, gender and age were included. The findings of this review appear to be broadly consistent with reviews conducted on this topic that focus on children. Luke and Banerjee (2013) and da Silva Ferreira *et al.*, (2014) both found that the majority of studies they examined show children with experience of maltreatment performed less well on FER tasks than controls. The findings of this review indicate that deficits in FER observed in childhood related to maltreatment appear to remain into adulthood. However, the number of studies using consistent methods was small.

1.4.3 Critical Review of literature

Although this review identified a main overall effect of adversity on FER ability; the inconsistency of the methodologies and overall lack of high quality research means that firm conclusions are difficult to draw. Many of the studies had small samples or were focused primarily on participant characteristics other than childhood adversity. Only two studies found no effect of adversity which perhaps indicates presences of publication biases (Easterbrook, Gopalan, Berlin, & Matthews, 1991). Furthermore, the results relating to the specificity of effects of differing forms of abuse reveal inconsistent results. Only a minority of articles reported findings in relation to type of abuse, the majority approached child maltreatment as a single construct. The findings were very variable with some of the studies finding recognition of specific emotions was impaired when certain types of abuse had been experienced. Whereas, others found strengths in recognition of certain emotions, such as anger were related to some forms of abuse. It is important that different types of maltreatment are explored because although different types of maltreatment are often co-occurring and interrelated; each type of abuse has been related to different outcomes in development and adjustment (Lee & Hoaken, 2007).

1.4.4 Measurement of FER ability

The results revealed that previous research studies have utilised a wide range of procedures in order to measure FER ability. There is no one standard method to investigate this

ability. Therefore, this wide variability in procedures impedes more precise comparisons and robust results. Many of the studies took the emotion recognition materials from the Ekman & Friesen, (1976) Pictures Of Facial Affect series. However, these materials were then employed in multiple ways and outcomes scored in using a variety of methods. Therefore, despite similarities, overall results were not strictly statistically comparable. In addition, some of the studies did not measure simple emotion recognition alone but measured more complex abilities such as speed of recognition, ability to recognise different intensities of emotion and thresholds of emotion recognition. The second most common method of FER ability was the 'Reading the Mind in the Eyes Test' (RMET; Baron-Cohen *et al*., 2001). This is a well validated measure, however, it only tests ability to read emotion from the eyes alone as such does not capture ability to read other facial emotion cues. Other measures that were employed offer interesting insights, such as the use of 'The Movie For the Assessment of Social Cognition' (Dziobek *et al*., 2006) which was used by Preißler *et al.,* (2010). This measure includes assessment of moving faces in dynamic situations. The greater complexity of this task found deficits in ability among participants with BPD and trauma, whereas, the simpler RMET did not. Despite these varied measures of FER ability and the difficulties that it creates for comparison; a broad picture of poorer facial emotion recognition in maltreated samples was observed.

1.4.5 Measures of adversity

The measures used to assess childhood maltreatment/adversity were mostly well validated with strong internal consistency. However, there were difficulties with some of methods used to assess childhood maltreatment for example one study used un-validated self-report questions. Another used a measure of PTSD that required participants to meet criteria for the condition rather than assessing experience of maltreatment. All but one study measured child abuse and neglect only, other adverse experiences in childhood were not explored. Key events in childhood were captured alongside abuse and neglect by Gemine *et al.,* (2015) using the Adverse Childhood Experiences Scale (ACE; Felitti *et al.,* 1998). This measure offered more nuanced exploration of childhood experiences including events such as parental substance use, mental health and

criminality. These experiences were related to poorer FER performance indicating the importance of investigating the impact of childhood events other than abuse.

1.4.6 Theoretical underpinning

The studies included in the review offer a range of theories on the environmental, learning and neurobiological aspects of the results. As mentioned in the introduction, there is a strong evidence base detailing the harm that major stressors during childhood can cause to the development of important brain areas (Cicchetti, 1989; Lee & Hoaken, 2007). Chronic stressors are known to activate the limbic system and the prefrontal cortex. Connections within these systems may be strengthened at the expense of other significant neural links. For example, those that are responsible for emotion regulation (da Silva Ferreira *et al*., 2014; Lee & Hoaken, 2007). Neurobiological changes seen in those who have experienced adversity in early life, are likely to be associated with brain areas that process and recognise facial emotions such as the amygdala and prefrontal cortex (Herba *et al*., 2006). From an environment and learning perspective it is the dysfunctional family environment that maltreated individuals experience that may influence ability to recognise emotions (Pollak *et al*., 2009). This hypothesis supports that idea that people who have experienced abuse where expression of some emotions, such as anger, were common have actually enhanced recognition of this emotion (da Silva Ferreira *et al*., 2014). People become hypervigilant towards expressions of emotion that may have been important for their survival and wellbeing when they were developing (Pollak *et al*., 1998). Furthermore, it offers explanation as to why these emotions may be over identified, as was seen in some of the studies reviewed here. Gibb *et al.*, (2009); Suzuki *et al.*, (2015); Veague, (2004) and Wagner & Linehan, (1999) all reported biases for recognition of fear or anger. However, again results were highly variable other studies found no impact of emotion type or abuse type on recognition. Some studies found greater accuracy for positive emotions (e.g. Wagner & Linehan, 1999; Young & Widom, 2014). Further investigation into the interaction between type of emotion and type of abuse is required to illuminate specificity of effects.

1.4.7 Participants and confounding variables

The review identified that most of the participants studied were women. This is likely to be because the most common participant group studied was people with Borderline Personality Disorder. BPD is known to be more likely diagnosed in women, although prevalence in men may be just as high (Grant *et al*., 2008). This creates difficulties for the applicability of findings to men. It is known that women and girls tend to perform better in emotion recognition and emotional processing tasks. This is thought to be related to a number of factors including cultural and neurobiological explanations (da Silva Ferreira *et al*., 2014; Hoffmann, Kessler, Eppel, Rukavina, & Traue, 2010; Luke & Banerjee, 2013). This may mean that the impact of childhood maltreatment observed in the studies is less pronounced than it may have been had more men been included. Only a minority of studies controlled for sex when analysing the results.

Important confounding variables were often overlooked in most of the studies, for example, intelligence. Intelligence is known to strongly correlate with FER ability (Shenk *et al*., 2013). Controlling for intelligence in the form of an IQ score or other estimate of intellectual ability is important in studies exploring FER ability. Differences between groups could be explained by IQ rather than by any other variable. Although many of the studies used control groups who were matched on some key demographic factors, most did not include IQ. Five studies controlled for IQ or cognition, all of these studies still found significant negative associations between maltreatment and FER ability. These findings support studies that have linked fluid and crystalized intellectual ability and FER ability. Both skills thought to be shaped by neurological development and previous learning experiences (Shenk *et al*., 2013).

Some of the observed sex differences in the study samples may have been explained by the lack of studies exploring the role of child maltreatment on FER in samples of persons with antisocial traits. Antisocial personality disorder traits are less commonly identified in women. However, rates of reported childhood maltreatment are high among men and women in this group (higher in women) (Alegria, Blanco, Petry, Skodol, Liu, Grant & Hasin, 2013). Although there is a strong body of literature that investigates FER in these populations (e.g. Bowen, Morgan,

Moore, & Goozen, 2014; Fairchild *et al*., 2009; van Goozen *et al*., 2007) no study to date appears to have looked at the role of adversity in childhood. This is interesting due to the recognised high level of adversity and maltreatment observed in these populations (Alegria *et al*., 2013; Bernstein, Stein, & Handelsman, 1998; Shi, Bureau, Easterbrooks, Zhao, & Lyons, 2012).

1.4.8 Study location

All the studies were conducted in Western countries, this has implications for the applicability of findings in other cultures and in less developed countries. The improved economic and psychosocial conditions often seen in developed countries may have influenced experiences of adversity. Cultural homogeneity between the countries where studies were conducted may have impacted on the amount of emotion people were exposed to and therefore impacted on learning opportunities. Further study of different cultures and economic areas is required to improve the potential for universally applicable results.

1.4 9 Quality

All the studies were assessed for quality in line with recommendations for systematic reviewing. The quality assessment enabled the review to identify studies with strong methodologies and reporting and weigh the evidence from strong articles accordingly. There were some studies with strong designs however the majority had issues with one or more element. The use of cross-sectional designs was the primary difficulty for most studies. It is difficult for studies assessing childhood events to use a design the separates the past events from the variable of interest. Most studies relied on retrospective reports which could be subject to reporting errors. However, research has shown that retrospective reports are unlikely to be false positives; only details of specific events are highly likely to be inaccurate (Hardt & Rutter, 2004). Only one study used a different approach (Young & Widom, 2014) by using a large sample of people who had documented cases of childhood maltreatment then were followed up over time. The detrimental effect of abuse one FER ability was still observed in this study indicating strengthening the evidence for a relationship.

Most of the studies used a case control design which was a strength. However, in some cases control groups were not matched on key variables or the control group had experienced trauma and were being compared to a group of clinical interest such as people with BPD. The difficulties in some of the control groups meant that confounding variables were often not controlled for which impacted on quality ratings. However, it is important to note that the NOS measures of quality were not designed specifically for cross-sectional studies.

1.4.10 Implications and recommendations for clinical practice.

The review provides a strong indication that experience of maltreatment/adversity in childhood can go on to affect the skill of emotion recognition in adulthood. Emotion recognition is an everyday skill that enables people to navigate their social world. Misidentification of emotion could lead to difficulties with social interaction and problems such as isolation, aggressive/anti-social behaviour and maladaptive coping strategies (Marsh & Blair, 2008; Minzenberg, Poole, & Vinogradov, 2006; Simon, Rosen, Grossman, & Pratowski, 1995). People who are unable to accurately identify what others may be feeling are likely to struggle to succeed in any area of life involving relationships. Work, family life and social life could all potentially be affected. This may mean on top of the other impacts of childhood adversity (i.e. insecure/disorganised attachments, traumatic memories and mental health difficulties), people who find FER difficult are more likely to be impaired in ways that leave them at vulnerable and at further social disadvantage. An impairment in recognition of emotion may additionally be linked to poor emotion regulation. If a person over or underestimates the emotion a person is showing or completely misidentifies it then their emotional response is likely to be incongruous to the situation (i.e. an over or under reaction) (Minzenberg *et al*., 2006). This may make social interaction more difficult for example if a person thinks that another person is showing anger when they are not this could lead to a physical or verbal altercation.

With this in mind, it is important that people who have had experiences of abuse, neglect or other early adversity are not assumed to have a level of emotional understanding that others may have. Service providers working with individuals who have these experiences should be

aware that emotions may be misinterpreted leading to difficulties in social interaction. Therapists working in this area may find it helpful to check levels of emotional literacy and include teaching on emotions if necessary. A programme has been developed for increasing emotional recognition in children (Hubble, Bowen, Moore, & Goozen, 2015) which was shown to have a positive effect. However, this was achieved with young people with conduct disorder symptoms and was shown to reduce offending it is unsure if this may be helpful in other populations. A history of maltreatment is a transdiagnostic concept and deficits in FER ability may result in different outcomes for people with different conditions. For example, in schizophrenia it is linked to experiences of paranoia (Aas *et al*., 2017) and in BPD it is linked to self-harm and volatile relationships (Domes *et al*., 2009). Therefore, it would be important to tailor any intervention towards specific groups/individuals and their needs.

1.4.11 Conclusion and implications for future research

This review has explored the impact of childhood maltreatment and adversity on the ability to recognise facial displays of emotion. It has identified a likely relationship between experience of childhood maltreatment and adversity and poorer facial emotion recognition. The review found a wide range of results exploring the effect of specific forms of abuse and specific emotions. The variety of measures used to assess FER ability and childhood maltreatment made synthesis of findings difficult. Methodological diversity and quality of study design impacted on the reliability and representativeness of results. Future research should perhaps primarily focus on development of a common measure of FER ability. This would enable thorough exploration of findings using meta-analysis. Additional studies are needed that a) control for variables that are known to influence FER ability b) include large samples ideally using prospective designs c) assess for specific effects of type of abuse. Further research could explore the impact of deficits in FER on behaviour among people who have experience maltreatment. Specifically focusing on coping, maladaptive behaviour and social interaction.

Chapter 2: Empirical Research Paper

Childhood adversity the relationship with Facial Emotion Recognition and maladaptive behaviour among homeless adults

2.1 Introduction

2.1.1 Homelessness

People experiencing homelessness represent one of the most socially excluded, vulnerable and hard to reach populations in society (Hodgson, Shelton, & van den Bree, 2015). In the UK, the prevalence of homelessness has increased in recent years. In 2017, 78,930 households were identified as living in temporary accommodation a 4% increase on 2016 figures (Homeless Link, 2017). The number of people who sleep rough has also increased each year since 2010, with most recent figures estimating 4,751 people were sleeping rough on any one night(Homeless Link, 2018).

The causes of homelessness and the issues which maintain it are often complex, stemming from a combination of individual and societal factors. People who are homeless have frequently experienced adversity in childhood (Hodgson, Shelton, & van den Bree, 2015; Craig & Hodson, 1998; Marpsat, Firdion & Meron 2000). Several studies have identified high rates of abuse and neglect in the homeless population (Hodgson *et al*., 2015), while others have identified high levels of other forms of early adversity, including poor parental mental health, antipathy and drug use (Craig and Hodson, 1998). The experience of complex trauma can lead to behaviour, coping mechanisms and mental distress that may be more commonly labelled as a personality disorder or as other mental health conditions (McManus & Thompson, 2008; Maguire, Johnson, Vostanis, Keats & Remmington 2010).

Traumatic experiences often occur as a result of becoming homeless. For example, homeless people are significantly more likely to experience violence and abuse(McManus & Thompson, 2008). This experience of trauma can often compound and further exacerbate the trauma from adverse child experiences (McMannus & Thompson, 2008; Marpsat *et al*., 2000).

Whilst there are several macro societal and environmental factors implicated in repeat and chronic homelessness, people with individual vulnerabilities, such as complex histories and maladaptive coping strategies, are at greater risk of becoming stuck in the 'revolving door' of homelessness as maladaptive behaviour patterns can result in repeated tenancy loss (Chamberlain & Johnson, 2013; Kertesz, Horton, Friedmann, Saitz, & Samet, 2003).

The experience of adversity is recognised as having a significant impact on future mental health and maladaptive behaviour of people experiencing homelessness (Hodgson, Shelton & van den Bree, 2015). The enduring effect of childhood maltreatment is well recognised: people who have been maltreated are at greater risk of developing both internalising and externalising difficulties (Kim & Cicchetti, 2010). The early relationships children have with their caregivers are pivotal for development of emotional understanding (Cicchetti & Toth, 2015). Children who have experienced adversity have likely experienced dysfunctional relationships with their early caregivers, leading to deficits in skills that develop as a result of attunement and secure attachment (Cicchetti & Toth, 2015; Pollak 2000). This includes, amongst other skills, the ability to recognise and understand emotions in both themselves and others (Fairchild, Van Goozen, Calder, Stollery, & Goodyer, 2009). One way children are thought to learn about both their own and others emotions is through affect mirroring with their caregiver (DeOliveira, Bailey, Moran, & Pederson, 2004; Pfeifer, Iacoboni, Mazziotta, & Dapretto, 2008) Abusive parents may produce inconsistent or frightening emotional expressions which may not reflect the child's own expressed emotion and result in impaired emotional understanding (Fonagy, Gergely, Target, & Jurist, 2002). Neglectful parents are also unlikely to mirror a child's affect and additionally may themselves demonstrate inappropriate or inhibited displays of emotion, meaning children of neglectful parents may not learn emotional expressions or alternate perspectives (Luke & Banerjee, 2013). Another theory suggests that children who experience abuse may learn to become hypervigilant or habituated towards expressions of emotion. Hypervigilance for emotions important for wellbeing and survival, such as anger and fear, may lead to over identification of

these states. Whereas, habituation could occur when extremes of emotion are the norm (Pollak, Cicchetti, Hornung, & Reed, 2000).

2.1.2 Facial Emotion Recognition

Facial emotion recognition is a fundamental skill for social interaction and communication (Marsh & Blair, 2008). An emotional facial expression is thought to elicit both an emotional response in others, and a behavioural response associated with that emotion (Jovev *et al*., 2012;Kring & Sloan, 2007). Being able to accurately identify the emotions of others therefore helps people to decide on an appropriate behavioural response. Blair (2001) suggests that accurate processing of people's displays of sadness or fear inhibits antisocial behavioural responses, whereas if a person is unable to detect distress signals, conveyed through emotional expressions, then they may display harmful or antisocial behaviours. Misinterpretation and over interpretation of emotional responses have also been linked to interpersonal difficulties (Wagner and Linehan, 1999). For example, if a person over interprets anger expressions, they may be more likely to act in an angry or fearful way (Jovev *et al*., 2012).

Difficulties recognising emotions have been found in a range of different populations. Young people with conduct problems and people who have committed criminal offences often have deficits in the ability to recognise negative emotions in others (Bowen & Dixon, 2010; Fairchild *et al*., 2009; Hoaken, Allaby, & Earle, 2007). Furthermore, people who have autism also show deficits in recognising emotions, alongside difficulties in social interaction and communication (Black *et al*., 2017; Castelli, 2005). Borderline Personality Disorder (BPD), a condition characterised by difficulties in interpersonal relationships and emotion regulation, usually in response to complex trauma, has also been linked with deficits in recognising emotions (Domes, Schulze, & Herpertz, 2009). Findings relating to emotion recognition in this population have found mixed results. In some studies, when people with BPD are in an emotionally dysregulated state, they have been shown to have poorer FER ability. However, when not experiencing heightened emotion, people diagnosed with BPD can be hyper-sensitive to recognising emotion (Schulze, Domes, Köppen, & Herpertz, 2013). The literature suggests that

certain emotions may be impacted differently. For example, in a study of women with BPD, participants were shown to over identify anger (Veague & Hooley, 2014; Wagner & Linehan, 1999). Whereas, recognition of happy faces was impaired in the people with BPD (Wagner & Linehan, 1999). Furthermore, (Lynch, Rosenthal, Kosson, Cheavens, Lejuez & Blair, 2006) found that people with BPD were more likely to rate negative emotions as more intense.

As discussed in Chapter 1, in the case of people diagnosed with BPD and in those who have experienced childhood trauma; research indicates a link between early traumatic experiences and difficulties with emotion recognition, including FER (Germine & Hooker, 2011; Luke & Banerjee, 2013; Young & Widom, 2014). Pollak, Messner, Kistler, & Cohn, (2009) outline a hypothesis suggesting that maltreated children have altered sensory thresholds for understanding emotion due to early socialisation experiences. Adverse experiences in early life may make specific stimuli more salient and the developing perceptual systems of the child become sensitive to these stimuli. For example, being hyper aware of anger and consequently misattributing other emotions as angry (Luke & Banerjee, 2013). The amygdala and pre-frontal cortex are recognised as being important brain areas for FER ability. Research suggests that activity in these areas is increased when observing emotional faces. (Pollak, Cicchetti, Klorman, & Brumaghim, 1997a) identified that maltreated children had increased Event Related Potentials in response to being shown even mild displays of emotion compared to controls.

2.1.3 FER and maladaptive behaviours

People who experience homelessness often experience difficulties with maladaptive behaviour and interpersonal situations, for example, use of drugs and alcohol, aggression and self-harm, which can lead to continued or repeat episodes of homelessness (Johnson & Chamberlain 2008a). There is growing evidence to suggest that people who have experienced early maltreatment may comprehend social situations – and the emotions associated with them – in different ways to people who have not had such experience (Pollak *et al*., 2009). This alteration in perception may result in different behavioural responses and coping mechanisms among the maltreated population. Luke & Banerjee (2013) suggest a potential mediational role for social

understanding, including facial emotion recognition, in the relationship between childhood adversity and maladaptive behaviour.

2.1.4 Aim and hypotheses

FER ability has never been explored in the homeless population before, given the links to early adversity and the known behaviours that lead to continued homelessness described above, this study aimed to explore the role of FER ability in this population. The study investigates childhood adversity, facial emotion recognition ability and maladaptive behaviour among a sample of homeless adults. The role of facial emotion recognition in the relationship between adverse childhood experiences and maladaptive behaviours was explored. Specifically, the study aims to explore following hypotheses:

a) In comparison to controls from the general population, a homeless sample will have significantly poorer facial emotion recognition ability.

b) There will be a significant and predictive relationship between experiences of childhood adversity and FER ability as well as maladaptive behaviours.

c) There will be a significant and predictive relationship between FER ability and maladaptive behaviour.

d) The relationship between adversity in childhood and maladaptive behaviour in people with experience of homelessness will be mediated by ability to recognise facial emotions.

2.2 Method

All elements of the research reported here were scrutinised and approved by the Southampton University Research Ethics Committee. Details of the ethics application can be seen in the appendix (Appendix 2.1)

2.2.1 Design

A mixed design was used to assess the different hypotheses. A group comparison design was used to compare facial emotion recognition ability in people experiencing homelessness to

age and gender matched controls from the general population. A cross-sectional study design was used to explore the relationship between retrospectively collected data on adversity in childhood and FER ability in the sample of people who were experiencing homelessness. In addition, this design enabled exploration of the relationships between adversity, FER and maladaptive behaviours. A mediation analysis would enable exploration of the potential role for FER in linking adversity in childhood to maladaptive behaviours in adulthood.

In order to enable a mediation analysis, the sample size required was large. As was mentioned in the Chapter 1. most studies exploring the link between adversity and FER have found small to medium effect sizes. Bootstrapping procedures are recommended in this scenario; this method enables greater power to be achieved and therefore effects are more likely to be observed (Preacher & Hayes, 2004). Fritz & MacKinnon, (2007) recommend that for mediation involving bias corrected bootstrapping procedures a minimum of seventy-one participants is required given an expected medium effect size for both α and β paths. To calculate the sample size required for the control group G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) was used. With a medium to large effect size, with 95% power using an independent groups *t*-test, with alpha at .05 the required sample size was twenty-two participants in the control group and eighty-six in the homeless sample. Power estimates were based on previous studies from Chapter 1 where clinical or samples with experience of trauma were compared to healthy/general population controls.

2.2.2 Participants

Participants in the homeless sample were recruited using an opportunity sampling method from homeless hostels in the South East of England. Male and female adults (aged 16 years or above) who were considered homeless were eligible. Current homelessness was defined as a person without permanent accommodation including those residing in homeless hostels, shelters, rough sleepers and any other form of temporary accommodation (Housing Act, 1996). Participants were excluded if they were unable to understand spoken and/or written English, if

they were unable to recall childhood events or if they were under the influence of an intoxicating substance to the extent that would impair their participation.

Participants were recruited in a number of ways to enable the collection of a large and varied sample that would be representative of the adult homeless population. Posters and flyers were distributed to hostels that agreed to take part in the research. Participants were offered £6 vouchers in return for their time. Hostel staff collected names of those interested in taking part prior to the researchers arriving. The researchers promoted the study within the hostel on arrival and asked residents if they would like to participate as opportunities arose. Ninety-one people were initially recruited from a potential pool of approximately 200 residents from six hostels. Subsequently participants were removed from the study for several reasons; intoxicated (n=1); unable to complete the FER task on medical grounds (n=2); reported or were observed not completing the FER task correctly (n=2); questionnaire measures not fully complete or incorrect (n=4). Eighty-two participants were included in the final analyses. See Table 2.1 for sample characteristics. The final sample were 58.5% male with an average age of 34.95 years (*SD*, 11.92; Range 17, 54 years). The average age that the sample first became homeless was 27.39 years old (*SD*, 11.88) and the average length of current homelessness was 24.35 months (*SD*, 32.60). Overall the average number of times homeless was 2.29 time (*SD*, 1.59). The majority of the sample were residing in hostel/temporary accommodation (93.9%).

A small age and gender-matched group from the general population, consisting of 22 people, was collected following the recruitment of the homeless sample. These participants were recruited through flyers and by use of a snowballing sampling technique. Age and gender were matched in proportion with the homeless sample. The general population group were recruited solely to compare findings on the Facial Emotion Recognition Task in the homeless sample to a sample of people from the general population. See Table 2.1 for control sample characteristics.

Table 2.1

Sample characteristics of homeless and control groups.

Demographic variable	**Homeless Sample** ***n*=82**	**Control (*n*=-22)**
Gender n (%)		
- Male	48 (58.5)	13 (59.1)
- Female	34 (41.5)	9 (40.9)
Race		
- White n (%)	71 (86.6)	20 (90.92)
Age $\bar{x}$ (SD)	34.95 (11.92)	34.00 (13.80)
Years of Full-Time Education M (SD)	11.60 (2.75)	-
Educational support at school n (%)	23 (28.0)	-
Qualifications n (%)		
- None	22 (26.8)	0(0)
- Entry Level NVQ or similar	8 (9.8)	0(0)
- GCSE or equivalent	29 (35.4)	3 (13.6)
- A Level or equivalent	16 (19.5)	5 (22.7)
- Diploma or equivalent	6 (7.3)	7 (31.8)
- Degree or post-graduate qualification	1 (1.2)	7 (31.8)
Age first homeless $\bar{x}$ (SD)	27.39 (11.88)	-
Number of times homeless $\bar{x}$ (SD)	2.29 (1.59)	-
Length of current homelessness months $\bar{x}$(SD)	24.35 (32.60)	-
Current Accommodation (%)		
- Hostel/Temporary Accommodation	77 (93.9)	0(0)
- Streets	3 (3.7)	0(0)
- Overcrowded Housing	1 (1.2)	0(0)
- Sofa Surfing	1 (1.2)	0(0)
- Own house/rented	0 (0)	22 (100)

2.2.4 Measures

Demographic Questionnaire: All participants completed a short demographic questionnaire. This questionnaire included basic questions on sex, age and level of education that were completed by the homeless sample and controls. Further questions regarding the experience of homelessness were completed by the homeless sample only. This included questions such as; length of homelessness, age they were first homeless and number of times homeless. (Appendix 2.2)

ACE: The Adverse Childhood Experiences (ACE) (Feliti & Anda 2010) questionnaire is an internationally recognised dichotomous ten item measure. This measure was completed by the homeless sample only, to assess the presence of early life adversity. The ACE assesses experiences of abuse and adversity experienced before the age of eighteen. A total score is calculated by adding all the 'yes' responses. The questions relating to abuse include items on physical, emotional and sexual abuse as well as items on physical and emotional neglect. Household dysfunction questions include witnessing domestic violence, parental substance misuse, parental separation/divorce, household member imprisoned and household mental health/suicidality (Appendix 2.3).

The ACE has strong test re-test reliability (r=.956, p<.01) (Thomson & Jaque, 2017). Internal consistency scores are not appropriate for this measure. The ACE has been used in multiple studies exploring different populations making it possible to compare findings from the homeless sample in this study to other populations.

Facial Emotion Recognition: Facial Emotion Recognition was assessed using a short computerised test (Bowen, Morgan, Moore & van Goozen, 2013). Both the homeless and control sample completed this measure. The Facial Emotion Recognition (FER) task was made using the application Medialab (Jarvis, 2016) and consisted of a series of 150 slides displaying facial expressions drawn from Ekman and Friesen's (1975) facial affect battery. Ekman and Friesen's series of images are the most widely used stimuli for assessing facial emotion recognition. As detailed in Chapter 1 previous research has identified the reliability and validity of these images,

although studies have used the images in different ways. In this study six target faces were used (three female and three male). Each face displayed one neutral expression and six emotional expressions (happiness, sadness, fear, anger, disgust and surprise). Each emotional expression has been morphed with the neutral expression to display each emotion at 25%, 50%, 75% and 100% intensity. The hair and backgrounds to the images were removed leaving only the facial features. The faces were displayed on a computer screen with the accompanying question 'what emotion is this face showing?' alongside seven numbered options (the emotions described above plus neutral). An overall percentage correct score is calculated. Percentage scores for each specific emotion and level of intensity displayed are also generated.

Composite Measure of Problem Behaviours: The Composite Measure of Problem Behaviours (CMPB) (Kingston, Clarke, Ritchie, & Remington, 2011) is a 46-item measure that provides an overall score on common problematic behaviours seen in a range of populations. In addition, the measure provides a scores for ten specific behaviours including; self-harm, restrictive eating, binge eating, excessive alcohol use, drug use, nicotine use, excessive exercise, aggression, sexual promiscuity and excessive internet/computer game use. Participants were required to rate themselves on a six-point scale for each question ranging from 'very like me' to 'very unlike me'. An example item is 'It is like me to go out with friends who are drinking but opt to stay sober' (Appendix 2.4).

The CMPB has good construct validity when correlated with measures identifying similar problem behaviours (Kingston *et al*., 2011). The measure also shows good internal consistency (α =.87) and test-retest reliability at 2 weeks, 2-4 months and 8-14 months (Kingston *et al*., 2011).

It was thought that not all problem behaviours would be common among the homeless sample. However, the measure could provide an overall idea of the level of problematic behaviour that may be linked to prolonged homelessness as well as to specific behaviours that may result as a consequence of childhood adversity and poor FER ability.

IQ: Intelligence is a key correlate of FER ability, therefore, it was important to include a measure of IQ; the effect of intelligence then could be controlled for in the analyses. A brief measure of adult intelligence the Wechsler Test of Adult Reading (WTAR) (Holdnack, 2001) was used. The WTAR is a 50-item test requiring participants to read a list of words aloud whilst an examiner scores pronunciation. The score given on the WTAR provides an estimate of predicted IQ. It was decided that this would be sufficient for the purpose of the study as the study was not primarily interested in IQ. The WTAR has some flaws in that it does not have strong predictive power for people at the very low or very high ends of the IQ scale. The WTAR has benefits in terms of the speed of administration and good predictive ability of IQ in the low to high average range, furthermore, the WTAR is a good predictor of IQ in the presence of alcohol/drug misuse, mental health problems and brain injury (Holdnack, 2001).

2.2.5 Procedure

Prior to completing the study participants were given a detailed information sheet and verbal explanation of the study including the types of questions that would be asked. If they understood and agreed to take part then they completed the consent form. Homeless participants who took part were included in two studies a researcher from each study was present at all recruitment and participation stages. Both researchers were final year Trainee Clinical Psychologists.

First, homeless participants completed the demographic questionnaire and a one item distress rating scale. This was used to ensure that participants were not overly distressed by taking part, if distress was caused the researchers took steps to manage this and directed the person to appropriate services. Questionnaires and the computerised FER task were completed in a random order to avoid any effects of order or fatigue. The ACE was the one exception to this, this measure was always completed in the middle. Some of the questions in the ACE measure could be distressing. The researchers did not want to leave participants feeling distressed at the end of the study or to deter them from continuing by completing it at the start. Participants filled out questionnaires and completed the computer task by themselves unless they were identified as

struggling with understanding/reading the questions or with operating the computer. In this situation, one of the researchers would sit with the person and assist them with their participation. The WTAR measure was completed by a trained researcher with each participant. The participant had to read a list of words while the researcher scored them on pronunciation.

Upon completion of the measures, the homeless participants were given a short mood repair task and were asked to re-rate themselves on the distress measure. If an increase in distress was observed the researchers would ensure the person was safe and ok to leave. If this was not the case researcher would discuss techniques to manage distress and provide information about services available. If necessary they would alert hostel staff. A qualified Clinical Psychologist was made available to the participants should they or the hostel staff require further support. A detailed debrief form and information on local mental health support services were provided before the participants left. In total for both studies participation lasted approximately one hour.

Control participants who consented to take part completed the demographic questionnaire and the FER computer task only. They were provided with an information sheet prior to taking part and a debrief at the end.

Personally identifiable information from the consent forms was kept separately from the study information. This was linked using a code in case a participant decided they wanted to withdraw from the study.

2.2.6 Data preparation analysis

Questionnaires were scored according to the manual for each measure. Sum totals and/or mean scores were calculated, subscale scores were then computed. Analyses were conducted using Statistical Packages for Social Sciences V24 (SPSS; IBM, 2016). All data were cleaned and checked for missing data. Once the participants mentioned above were removed there were no instances of missing data.

Preliminary statistics and tests were then conducted to explore whether the data met the required assumptions for the analysis. All the required variables met criteria for normality, as

checked by creation of histograms and distribution curves. Scores were converted to z-scores to assess for skewness and kurtosis. Kolmogorov-Smirnov tests were also used to confirm these findings meaning parametric analyses were indicated (Field, 2015). No significant outliers were identified and assumptions of independence were met for the case-control element of the analyses. The control sample participants were collected completely separately to the homeless sample. The internal consistency of the CMPB questionnaire was computed (α = .86) indicating a good level of reliability (Kline, 1999). In addition, the subscales of this measure were checked for reliability; drug use (α =.90) excessive alcohol (α =.85) self-harm (α =.77) restrictive eating (α =.43) binge eating (α =.26) sexual promiscuity (α =.73) excessive exercise (α =.71) aggression (α =.69) excessive internet/game use (α =.68) nicotine use (α =.70). This analysis revealed that most of the subscales had a high level of reliability, however the restrictive and binge eating subscales showed lower reliability. This may show that these subscales are not relevant in the study population or that questions may have been misinterpreted. Following these findings, the total score and subscales were used in the final analyses with the exception of the binge eating and restrictive eating subscales.

2.2.7 Data Analysis

Several different analyses were planned for the data once collected. Firstly, demographic information, prevalence of childhood adverse experiences and scores on the FER and CMPB were calculated. Next, a *t*-test was completed to compare the performance of controls and homeless participants on the FER task. Following this, correlations between the variables of interest were completed including between subscale items. Multiple regression analyses with bootstrapping were then to employed to assess the magnitude of the effect of adversity on FER ability. Intelligence was controlled in analyses involving the FER task because of its known link to IQ (Shenk *et al*.,2013). A mediation analyses with Bootstrapping was planned to explore the mechanism of effect linking childhood adversity FER and maladaptive behaviour.

2.3 Results

2.3.1 Participants

Ninety-one people with experience of homelessness took part in the research, nine participants were excluded due to missing data or incorrectly completed measures. The eighty-two remaining participants with experience of homelessness were included in the full analysis. Twenty-two age and gender matched control participants from the general population were included in the between groups analyses.

2.3.2 Descriptive statistics on childhood adversity, FER, IQ and maladaptive behaviour

The results of the ACE questionnaire reveal a high prevalence of abuse experiences among the homeless sample, 98.8% had experienced at least one form of adversity (ACE score 1-3=28.05%; 4-6 = 42.68%; 6-10 = 28.05%) The prevalence of physical abuse under the age of 18 years old was 67.1% and the presence of sexual abuse was 29.3%. Other early life adversity is similarly high in the this sample, for example, living with a substance user (57.3%) and having a household member go to prison (34.1%) see Table 2.2.

Table 2.2

Childhood adversity in homeless sample

Childhood adversity scale	**Homeless sample**
	***n*=82**
	$\bar{x}$ (SD)
ACE total score $\bar{x}$(SD)	5.07 (2.53)
Abuse variables	2.51 (1.47)
Household dysfunction variables	2.59 (1.60)
Childhood abuse variables	**n (%)**
ACE Emotional abuse	59(72.0)
ACE Physical abuse	55(67.1)
ACE Sexual abuse	24(29.3)
ACE Emotional Neglect	46(56.1)
ACE Physical Neglect	29(35.4)
Childhood adversity variables	**n (%)**
ACE Parents divorced/separated	55(67.1)
ACE Violence towards mother	32(39.0)
ACE Living with a substance user	47(57.3)
ACE Parental mental illness/suicidality	44(53.7)
ACE Household member went to prison	28(34.1)

2.3.3 FER ability and comparison with controls

Ability to recognise facial displays of emotion was measured using the FER task. Results on this task reveal a pattern of impaired emotion recognition among the homeless sample. The homeless sample were compared to the age and gender matched control sample, from the general population, the homeless sample were found to be significantly poorer at recognising all emotions ($t(102)=-8.17$, $df = 102$, $p<.001$) there was a large effect size ($d=1.74$). There was a significant deficit among the homeless population in terms of recognition of all emotions however sadness and anger showed the largest effect sizes ($d=1.47$; $d=1.37$) indicating they were least well recognised compared to controls. In addition, there were very large effect sizes for the difference between homeless and control groups on faces presented at all different intensities (25% $d=1.2$; 50% $d=1.67$; 75% $d=1.62$; 100% $d=1.35$). The smallest effect sizes were for recognition of happiness, surprise and neutral ($d=.72$; $d=.95$; $d=.41$). Table 2.3 displays the findings from the FER task for both the homeless and control samples as well as the results of *t*-tests comparing the findings.

Table 2.3

FER ability in homeless and control samples

FER accuracy	**Homeless sample** ***n*=82** **% correct(SD)**	**Control** ***n*=21** **% correct (SD)**	***t*-value**	**Effect size** ***d***
FER total	48.98(12.17)	69.09(9.67)	-8.17**	1.74
FER Happy	72.46(18.98)	85.04(10.58)	-4.08**	.72
FER Sad	39.58(17.47)	63.64(11.94)	-7.53**	1.47
FER Fear	37.50(18.84)	58.52(12.37)	-6.89**	1.20
FER Anger	45.88(16.80)	69.51(19.56)	-5.18**	1.37
FER Disgust	35.67(19.68)	59.66(19.85)	-5.04**	1.23
FER Surprise	58.33(17.85)	73.86(10.30)	-5.26**	.95
FER Neutral	75.20 (29.88)	86.36(12.21)	-2.65**	.41
FER 25% intensity	17.28(9.17)	29.48(13.69)	-3.95**	1.2
FER 50% intensity	47.42(14.73)	71.71(14.36)	-7.01**	1.67
FER 75% intensity	61.08(16.60)	85.98(10.55)	-8.58**	1.62
FER 100% intensity	67.04(16.53)	87.32(7.68)	-8.27**	1.35

**significant at the 0.05 level ** significant at the 0.01 level*

2.3.4 Problem Behaviours

Table 2.4 provides the results of the CMPB questionnaire measure of problem behaviours. The results indicate that the homeless sample have a number of areas of problem behaviour. Scores were highest in the areas of illicit drug use, alcohol use, aggression and nicotine.

Table 2.4

Composite measure of problem behaviour in homeless sample.

CMPB variables	**Homeless Sample** ***n*=82** $\bar{x}$**(SD)**
CMPB composite score	3.16 (0.55)
Illicit drug use	3.57(1.60)
Excessive alcohol use	3.45 (1.58)
Deliberate Self-harm	2.67(1.41)
Restrictive eating	2.57 (0.91)
Binge eating	3.01 (0.91)
Sexual promiscuity	2.34(1.46)
Excessive exercise	3.03(1.23)
Aggression	3.20(1.19)
Excessive Internet use	2.95(1.13)
Nicotine use	4.29(1.07)

2.3.5 Trauma and FER

The overall scores on the ACE and FER task were not associated (r=-0.41, p>.05) however there were associations between specific forms of trauma and performance on the FER task Table 2.5 provides the correlations between ACE and FER variables. Significant negative associations were found between a household member going to prison and FER total, anger and 25% intensity accuracy (r=-.25, p<.05, r=-.233, p<.05 r=-.221, p<.05); domestic violence and FER happiness accuracy (r=-.218, p<.05), parental divorce/separation and FER sadness, anger and 25% intensity accuracy (r=-.321, p<.001; r=-322, p<.001; r=-.347, p<.001), sexual abuse and FER neutral accuracy (r=-.245, p<.05). Emotional abuse and FER sadness and fear accuracy were positively associated (r=.218, p<.05, r=.225, p<.05). Intelligence was associated with total

FER accuracy (r=.475, p<.001). In addition, the IQ score correlated with all the different specific FER emotions and different intensities apart from emotions presented at 25% intensity.

Where associations were found for elements of FER performance multiple regression analyses were completed to allow for exploration of the magnitude of effect that specific forms of early life adversity had on current FER abilities. IQ scores were controlled for in this analysis as this was a strong correlate of FER abilities. Gender did not need to be controlled for as it did not correlate with any of the variables of interest. Table 2.6 shows the results of the regression analyses. Six predictive relationships between childhood adversity and FER ability remained when estimated IQ was controlled for. Experience of violence towards mother and recognition of happiness (Adjusted R^2 =.10 , F=3.75 , df=1,79 , p<.05) parents separating and recognition of anger, sadness and accuracy at 25% strength of emotion (Adjusted R^2 =.12 , F=8.71, df=1, 79, p<.001) (Adjusted R^2 =.18 , F=8.81 , df= 1,79 , p<.001) (Adjusted R^2 =.12 , F=10.51 , df=1,79, p<.001); sexual abuse and recognition of neutral faces (Adjusted R^2 =.16 , F=6.02, df=1,79 , p<.001); family member sent to prison and recognition of emotion at 25% intensity (Adjusted R^2 =.03 , F=.40 , df=1,79 , p<.05). All other relationships identified in correlations were not significant predictors when estimated IQ was controlled for.

Table 2.5: *Correlations between ACE and FER variables*

	ACE total	Physical abuse	Emotional abuse	Physical Neglect	Emotional Neglect	Sexual abuse	Parents divorced	Parent Prison	Domestic violence	Parent substance use	Parent mental health
FER Total	-.041	-.004	.110	.022	-.017	.026	-.167	-.249*	-.092	.085	.082
FER Happy	-.190	-.180	-.144	-.092	.049	-.026	-.146	-.142	-.218*	.009	-.082
FER Sad	.022	.090	.218*	.150	.088	.064	-.321**	-.173	-.084	.068	.088
FER Fear	-.013	.036	.225*	.033	.080	-.094	-.143	-.210	-.092	.050	.019
FER Anger	-.094	.054	.043	-.040	-.016	.011	-.322**	-.233*	-.052	.070	.009
FER Disgust	.103	.001	.063	.085	-.046	.157	.178	-.042	-.010	.077	.090
FER Surprise	.035	.037	.057	-.006	-.196	.094	-.043	-.181	.082	.093	.190
FER Neutral	-.095	-.090	.012	-.098	-.077	-.245*	.143	-.178	-.005	-.029	.075
FER 25%	-.169	-.136	.001	.013	-.002	.083	-.347**	-.221*	-.200	-.033	-.085
FER 50%	.041	.108	.173	.111	.022	.103	-.187	-.210	-.101	.120	.069
FER 75%	-.002	.020	.090	.044	-.018	.055	-.128	-.180	-.070	.119	.080
FER 100%	-.031	-.026	.087	-.048	-.047	-.032	-.063	-.232*	.007	.070	.153

*Note: * p<0.05, **p<0.001*

Table 2.6: *Linear model of predictors of FER ability with 95% bias corrected and accelerated confidence intervals. Confidence intervals and standard errors based on 1000 bootstrap samples.*

	FER total			**FER Happiness**			**FER anger**			**FER sadness**			**FER Fear**			**Fear Neutral**			**FER 25%**		
Regression blocks	b (CI)	SE B	β	b (CI)	SE B	β	b (CI)	SE B	β	b (CI)	SE B	β	b (CI)	SE B	β	b (CI)	SE B	β	b (CI)	SE B	β
1. IQ	**.45*** (.22, .66)	.11	.44		N/A		.25 (-.05,.54)	.15	.17		N/A			N/A			N/A		.05 (.12, -.21)	.08	.07
2. Prison	-3.82 (-9.0, 1.01)	2.50	-.15				-6.83 (-14.99, 1.17)	4.01	-.19										**-3.95*** **(**-7.75, -.70)	2.15	-.21
1. IQ		N/A		**.43*** (.07, .78)	18.44	.27		N/A			N/A			N/A			N/A			N/A	
2. Violence to mother				**-7.91*** (-16.06, -.09)	4.12	-.21															
1. IQ		N/A			N/A		**.28*** (.02, .52)	13.08	.20	**.45**** (.11,.73)	14.59	.31		N/A			N/A		.07 (-.07, .21)	6.75	.09
2. Parental separation							**-10.95**** (-18.59, -4.11)	3.62	-.31	**-11.08**** **(**-17.69, -3.76)	3.63	-.30							**-6.62**** (-10.94, -2.26)	2.22	-.34
1. IQ		N/A			N/A			N/A			N/A			N/A		**.85**** (.311, 1.46)	29.11	.34		N/A	
2. Sexual abuse																**-16.62*** (-31.28, -2.21)	7.44	-.25			
1. IQ		N/A			N/A		N/A			**.43*** (11, .75)	.16	.30	.33 (-.01, .67)	15.39	.21		N/A			N/A	
2. Emotional abuse										5.99 (-1.91, 13.89)	4.03	.16	7.49 (-2.07, 16.66)	4.74	.18						

*Note: Estimated IQ score was always entered in the first block. * p<.05 ** p<.001. R^2 change*

Table 2.8: *Correlations between childhood adversity and maladaptive behaviour*.

	ACE total	Physical abuse	Emotional abuse	Physical Neglect	Emotional Neglect	Sexual abuse	Parents Separated	Parent Prison	Domestic violence	Parent substance use	Parent mental health
CMPB total	.108	.187	.119	.291**	-.066	.048	-.157	.073	-.006	.227*	-.040
CMPB Drug use	.053	.090	.072	.066	-.056	.160	-.095	-.026	.002	.157	-.048
CMPB Alcohol use	-.009	.034	-.058	.095	-.296**	-.029	-.121	.034	-.027	.289**	.030
CMPB self-harm	.113	.042	-.042	.339**	.145	.071	-.018	.152	-.033	.072	.024
CMPB restrictive eating	.121	.172	.051	.254*	.027	-.162	-.086	.176	.141	.061	.080
CMPB binging	-.186	-.122	-.167	-.127	-.070	-.042	-.193	-.050	-.168	.017	-.076
CMPB sexual promiscuity	.102	.092	.040	.191	-.060	.115	.025	-.015	.016	.184	-.003
CMPB excessive exercise	.056	.094	.144	-.002	-.077	-.012	-.016	.057	.077	-.022	-.020
CMPB aggression	-.065	.118	.030	.043	.029	-.085	-.091	-.050	-.060	-.048	-.119
CMPB internet overuse	.193	.328**	.319**	.222*	.205	.041	-.015	-.048	.015	-.014	.018
CMPB smoking	.041	-.072	.073	.196	-.002	.027	-.067	.103	-.026	.153	-.076

*Note: *p<.05, **p<.001*

2.3.6 Adversity and Maladaptive Behaviour

The overall scores on the ACE and CMPB questionnaire similarly did not correlate, however; there were correlations between specific types of adversity and subscale scores on the CMPB. The total CMPB score was correlated with physical neglect and parental substance use (r= .291, <.001; r=.227, p<.05); alcohol misuse was correlated with emotional neglect and parental substance use (r=-.297,p<.001; r=.289, p<.001); self-harm was correlated with physical neglect (r=.339, p<.001); excessive internet and game use was correlated with physical abuse, emotional abuse and physical neglect (r=.328, p<.001; r=.319, p<.001; r=.222, p<.05) Table 2.8 presents the correlations.

2.3.7 FER and Maladaptive Behaviour

The overall scores on the FER and CMPB measures did not correlate. Analysis of the relationship between recognition of specific emotions and maladaptive behaviours did not reveal any significant correlation apart from a relationship between recognition of disgust and self-harm behaviour (r=-.230, p<.05) and between recognition of sadness and binge eating (r=-.234 p<0.5) (Appendix 2.5)

2.3.8 Mediation

It was hypothesised that facial emotion recognition may mediate the relationship between childhood adversity and maladaptive behaviours, but the current findings did not allow for exploration of this theory. As no overall correlational relationship was found between adversity and maladaptive behaviour, and there were only a few specific effects of adversity on FER and FER on maladaptive behaviours; a mediation analysis was not possible. The possible reasons for this are discussed in more detail in the next section.

2.4 Discussion

This study aimed to investigate the role of childhood adversity in facial emotion recognition ability and maladaptive behaviours among adults currently experiencing homeless. This is the first study to explore FER skill in this population. FER ability is recognised as an important ability involved in social interaction and relationships. The skill is thought to develop in

line with early relationships that children experience with their caregivers (Pollak *et al*., 2009). Traumatic and adverse experiences in childhood, common among the homeless population, are thought to disrupt this process. The behaviours that are often linked to maintenance of homelessness were then explored in relation to childhood adversity and FER ability.

2.4.1 Main findings

2.4.2 Prevalence of childhood adversity

Adverse childhood experiences were extremely common among the homeless sample 98.8% had experienced at least one form of adversity, with 70.7% experiencing four or more adverse childhood events. Emotional, physical and sexual abuse, as well as neglect, were very common, as were other forms of household dysfunction including having a parent in prison, witnessing domestic violence and parental mental illness and/or substance misuse. These findings highlight the vulnerability of this group. Early adversity is linked to numerous forms of disadvantage, including difficulties in social interaction and relationships (Ciccetti & Valentino, 2006; Pollak, 2008).

2.4.3 Hypothesis a) In comparison to controls from the general population, a homeless sample will have significantly poorer facial emotion recognition ability.

The results showed a highly significant difference in FER performance between the homeless and control samples, with a large effect size. Poorer FER ability by the homeless sample was found across all emotions and intensities, and confirmed the above hypothesis. This novel finding is in line with findings from similar populations, including people with BPD (Dyck *et al*., 2009) and those with experience of trauma (Young & Widom, 2014). The largest effect sizes were found in recognition of sadness, anger, disgust and fear. These could all be identified as 'negative' emotions (Domes, Schulze, & Herpertz, 2009; Young & Widom, 2014). Misinterpretation of these 'negative' emotional states is liable to lead to difficulties in relationships and interactions with others. This was shown by Blair *et al.*, (2001) where a deficit in recognition of fear and sadness was linked to aggressive and/or violent behaviours.

Furthermore, Wagner and Linehan (1999) found that over identification of male anger related to relationship difficulties.

2.4.4 Hypothesis b) There will be a significant and predictive relationship between experiences of childhood adversity and FER ability, as well as maladaptive behaviours.

Several significant and predictive relationships were identified between types of childhood adversity and FER abilities. Many of these relationships remained after controlling for IQ, a strong correlate of FER ability. One of the strongest relationships was found between sexual abuse and recognition of neutral faces. Neutral faces were not misidentified often by the rest of the homeless sample or by controls. However, those who experienced sexual abuse were found to be attributing emotion to neutral faces. This may be due to impaired learning about emotion in childhood. Affective mirroring by parents and caregivers is thought to be one of the ways children learn about their own and others emotions (DeOliveira *et al*., 2004). When a child is sexually abused, it is often by a care-giver or relative and they frequently do not tell anyone about the abuse (NSPCC, n.d.). This means that they are likely to experience invalidation or misunderstanding of their emotions from caregivers, along with confused representations of other's emotions (i.e. their abuser). Another explanation relates to maltreated children becoming hyper-alert to possible expressions of emotion. Pollak, Cicchetti, Klorman, & Brumaghim (1997b) identified increased brain Event Related Potentials when maltreated children were presented with emotional faces at low intensities compared to controls. Hypervigilance for expressions of emotion could be seen as adaptive skill for children who are experiencing abuse as it may enable them to anticipate, and therefore protect against, hostile or predatory behaviour. (Pollak *et al*., 2009). Over identification of emotion in neutral faces seen in this study could be seen as part of a hypervigilance for emotions. The findings of the current study indicate that the impact of sexual abuse on hypervigilance for emotion may remain into adulthood.

The other significant and predictive relationships were between 'household dysfunction' variables and FER ability. Being a witness to domestic violence towards their mother was predictive of poorer happiness recognition. Experience of parents separating or divorcing was

predictive of poorer anger and sadness recognition. These findings may be explained by reduced emotional availability of parents, leading to less emotional mirroring and therefore reduced opportunity for children to learn about emotions (DeOliveira *et al*., 2004). The findings could additionally relate to habituation to displays of negative emotion. This may be seen when domestic violence or anger and sadness in the home are seen as normal and do not elicit responses (Katz, Hessler, & Annest, 2007). This is supported by the finding that parental separation and experience of a parent going to prison were predictive of poor recognition at 25% intensity. The unavailability, both physically and emotionally, of parents in these situations is likely to lead to reduced learning about the subtleties of emotion and increased demands on the remaining parent to cope. This may mean that displays of high emotion become normalised.

The second part of this hypothesis suggests that there will be a relationship between adversity and maladaptive behaviours. This hypothesis was only partially confirmed. Some correlations were identified between ACE and CMPB variables. Only experiences of parental substance misuse and neglect were associated with increased total problem behaviour among the homeless sample. The total ACE score was not associated with problem behaviours. The reasons for this are likely related to the measures used. The measure of problem behaviour included a range of possible behaviours, not all of which were relevant for the homeless population. Furthermore, the ACE indicates presence or absence of types of abuse but does not provide a scale regarding the severity of abuse. This may mean the differences in the extent of people's experiences were missed.

2.4.5 Hypothesis c) There will be a significant and predictive relationship between FER ability and maladaptive behaviour.

This hypothesis was not confirmed: no significant relationship between FER ability and overall scores on the CMPB was identified. The possible reasons for the absence of association between these variables are likely to be similar to those discussed above i.e. the applicability of the measure of problem behaviours. In addition, FER ability may be more closely related to social understanding and relationships, rather than to other forms of maladaptive behaviour (Young &

Widom, 2014). A measure that considers social difficulties may have been more appropriate. Although the CMPB includes a measure of difficulties with aggression, other behaviours, such as use of alcohol, self-harm and smoking, may not be closely related enough to a deficit in the skills measures by the FER task.

2.4.6 Hypothesis d) The relationship between adversity in childhood and maladaptive behaviour in people with experience of homelessness will be mediated by ability to recognise facial emotions.

As a result of the findings discussed above, a mediation analysis was not indicated. Therefore, this hypothesis could not be explored. A relationship between childhood adversity and FER ability was identified for some specific types of adversity and emotions. Similarly, specific forms of adversity predicted some problem behaviours. FER ability predicted only two specific problem behaviours. The mediation path could not be assessed.

2.4.7 Implications

Primarily this study intended to explore the relationship between childhood adversity and facial emotion recognition and its implications for maladaptive behaviour among a homeless sample. Although the study was unable to draw conclusions regarding the impact of FER ability on behaviours that may maintain homelessness, several other clinically relevant implications can be identified.

The current study identified extremely high levels of complex childhood adversity including maltreatment and experience of household dysfunction among the homeless sample. 70.7% of the sample had experienced four or more types of childhood adversity. This is an important result which supports findings of previous research (Hodgson, Shelton, van den Bree, & Los, 2013). Many people who are homeless are unlikely to be accessing services for mental health difficulties (Folsom *et al*., 2005). The services provided to homeless people, whilst being aware of the trauma they may have encountered, are not always designed to support people who have had these experiences (Haigh, Harrison, Johnson, Paget, & Williams, 2012). The findings of

this study support the initiative to increase the availability of Psychologically Informed Environments (PIEs) for people who are homeless in the UK. A hostel that follows the PIE model takes into account the level of trauma among this population and plans the environment around this (Haigh *et al*., 2012). Outside of homelessness services, awareness among health and mental health professionals about the rates of trauma in this group is needed. The implications for treatment and adaptations that may need to be made should be considered.

The findings on facial emotion recognition indicate a huge deficit in emotional understanding among the homeless population. The homeless sample were impaired in recognising all emotions compared to controls. This has implications for support and mental health treatment provided to this population. An element of emotional education may be beneficial. There is some evidence for this being effective among offenders: Hubble, Bowen, Moore and Goozen, (2015) found that using a computerised facial affect training programme improved recognition of emotion and reduced severity of re-offending 6 months later, compared to controls. Some forms of mental health treatment include elements of emotional education and affect recognition. For example, Dialectical Behaviour Therapy (DBT; Linehan, 1993, 2014) designed for the treatment of Borderline Personality Disorder. The types of behaviour and complex trauma histories of homeless people indicate that DBT may be a useful way of addressing the mental health needs of this population. However, other models of treatment could include emotional literacy and affective training in order to make it more effective for people who are homeless.

2.4.8 Strengths and Limitations

The study should be understood in the context of its strengths and limitations. This is the first study to explore the role of FER ability in the homeless population. It adds to a growing body of research exploring the difficulties faced by those who are homeless and has implications for treatment and support provided to this group. Furthermore, as people who are homeless are a diverse group, the findings may be applicable to a wide range of people with similar presentations. The recruitment technique and subsequent sample size allow for generalizability to

the wider homeless population. The study took an ethical approach to recruitment, ensuring participants were reimbursed for their time, as well taking wellbeing into account through the choice of measures. Participants could talk any issues raised through with the researchers and support was available from a Clinical Psychologist if necessary. A range of hostel sites were accessed, including those for young people. The data therefore represents a wide range of the homeless population.

The design of the study was another area of strength. The case-control element of the study enabled comparison of the FER scores to age and gender matched controls from the general population. This was important because the measure of FER ability had never been used with homeless people before. This computerised task enabled objective measurement of FER skill. Another area of strength was the use of the ACE measure of childhood adversity. This measure is very well validated and has been used internationally but has not been widely used in homeless samples. The measure is simple to complete and minimises distress for the participants, whilst providing a reliable measure of adversity prior to age 18.

Limitations include the use of self-report measures. This introduces the risk of bias in the form of social desirability and demand characteristics. In addition, the ACE measure relies upon memory of the participants for events that occurred when they were children. A longitudinal study would avoid the issue of using retrospective self-reported data. However, this was not feasible given the variables the study focused on. Another potential area of bias was that participants self-selected into the study. It may be the case that individuals with greater levels of need, such as those who were least socially engaged or who had most problem behaviours, chose not to participate, affecting the validity of the results for all homeless persons.

As mentioned above, the measure of problem behaviours (CMPB) used may not have targeted enough relevant behaviours to allow a relationship with adversity and FER to be identified. Furthermore, a measure of difficulties in social interaction or relationships may have accessed more relevant concepts, enabling a mediation analysis to be completed. Similarly, the ACE measure had some deficiencies regarding the detail it provided on adverse experiences.

Another measure such as the Child Abuse and Trauma Scale (CATS; Sanders & Becker-Lausen, 1995) may have provided a more intricate level of data that graded childhood experiences and may have been more powerful in analyses.

2.4.9 Conclusions and Future Directions

This is the first study to explore the link between childhood adversity and Facial Emotion Recognition in a homeless sample. Very high levels of childhood adversity, including maltreatment and household dysfunction, were identified. Facial Emotion Recognition ability was significantly impaired in the homeless sample compare to controls with a very large effect size. The study found significant predictive relationships between experiences of adversity and recognition of facial emotions, for example, experience of sexual abuse and impaired identification of neutral faces. The findings indicate the importance of childhood experiences for social and emotional development that remain into adulthood. People experiencing homelessness have very often experienced multiple and complex adversity in early life. The current study suggests these experiences may be implicated in difficulties with emotional understanding. Such difficulties may lead to behaviours that maintain homeless status. However, it was not possible to assess the presence of a mediating role for FER ability in the relationship between adversity and maladaptive behaviours. The results indicate that there are implications for including affective training or emotional education in support or mental health treatment provided for this population.

The embryonic nature of the research means this area requires further investigation. Alternative measures of problem behaviour or difficulties with social interaction may enable the identification of a mediational role of FER ability. Future research is also required to explore the possible impact of training on emotions among this population. Training could potentially reduce situations leading to continued or repeat homelessness. It would be of further benefit to explore other areas of social cognitive functioning such as theory of mind or metacognitive awareness. This would facilitate a comprehensive understanding of the impact of childhood adversity on a range of skills essential for effective social interaction. Furthermore, it would enable society to

adapt and provide appropriate services that would be tailored towards developing skills and building social resilience among this group who are often excluded.

"We think sometimes that poverty is only being hungry, naked and homeless. The poverty of being unwanted, unloved and uncared for is the greatest poverty. We must start in our own homes to remedy this kind of poverty." Mother Teresa

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Appendix

Appendix 1.1

Quality Assessment Tool

NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE

CASE CONTROL STUDIES

Note: A study can be awarded a maximum of one star for each numbered item within the Selection and Exposure categories. A maximum of two stars can be given for Comparability.

Selection

1) Is the case definition adequate?

a) yes, with independent validation *

b) yes, eg record linkage or based on self reports

c) no description

2) Representativeness of the cases

a) consecutive or obviously representative series of cases *

b) potential for selection biases or not stated

3) Selection of Controls

a) community controls *

b) hospital controls

c) no description

4) Definition of Controls

a) no history of disease (endpoint) *

b) no description of source

Comparability

1) Comparability of cases and controls on the basis of the design or analysis

a) study controls for _____ (Select the most important factor.) *

b) study controls for any additional factor * (This criteria could be modified to indicate specific control for a second important factor.)

Exposure

1) Ascertainment of exposure

a) secure record (eg surgical records) *

b) structured interview where blind to case/control status *

c) interview not blinded to case/control status

d) written self report or medical record only

e) no description

2) Same method of ascertainment for cases and controls

a) yes *

b) no

3) Non-Response rate

a) same rate for both groups *

b) non respondents described

c) rate different and no designation

NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE

COHORT STUDIES

Note: A study can be awarded a maximum of one star for each numbered item within the Selection and Outcome categories. A maximum of two stars can be given for Comparability

Selection

1) Representativeness of the exposed cohort

a) truly representative of the average _____ (describe) in the community *

b) somewhat representative of the average _____ in the community *

c) selected group of users eg nurses, volunteers

d) no description of the derivation of the cohort

2) Selection of the non exposed cohort

a) drawn from the same community as the exposed cohort *

b) drawn from a different source

c) no description of the derivation of the non exposed cohort

3) Ascertainment of exposure

a) secure record (eg surgical records) *

b) structured interview *

c) written self report

d) no description

4) Demonstration that outcome of interest was not present at start of study

a) yes *

b) no

Comparability

1) Comparability of cohorts on the basis of the design or analysis

a) study controls for _____ (select the most important factor)

b) study controls for any additional factor (This criteria could be modified to indicate specific control for a second important factor.)

Outcome

1) Assessment of outcome

a) independent blind assessment *

b) record linkage *

c) self report

d) no description

2) Was follow-up long enough for outcomes to occur

a) yes (select an adequate follow up period for outcome of interest) *

b) no

3) Adequacy of follow up of cohorts

a) complete follow up - all subjects accounted for *

b) subjects lost to follow up unlikely to introduce bias - small number lost - > ____ % (select an adequate %) follow up, or description provided of those lost) *

c) follow up rate < ____% (select an adequate %) and no description of those lost

d) not stated

Appendix 1.2

Quality Assessment

Authors	Study Design	Selection †	Comparability ¥	Exposure ʊ	Outcome ł
1. Aas, Kauppi, Brandt, Tesli, Kaufman, Steen, Agartz, Westlye, Andreassen & Melle (2017)	Cross-sectional cohort	1.b) somewhat representative of the average schizophrenic patient * 2.a) drawn from same community sample as exposed cohort * 3.b) structured interview * 4. b) no	1. Study did not control for important factors	N/A	1. a) independent blind assessment * 2. b)no – cross-sectional 3. N/A
2. Barnett-Veague & Hooley (2014)	Cross-sectional case control	1. yes based on self reports 2. not stated 3. community controls * 4. no description	1.a) study controls for BPD history *	1. c) interview not blinded to case/control status. 2. a) same method of ascertainment for cases and controls 3. a) same rate for both groups *	N/A
3. Dyck, Habel, Slodczyk, Schlummer, Backes, Scheinder & Reske (2009)	Cross-sectional case control	1. a) yes with independent validation * 2. sample too small. 3. a) community controls * 4. a) no history of disease *	1. a) study controls for IQ. *	1. c) blind to case/control status*	N/A

4.	Elliot, Campbell, Meville, McCabe, Newman & Loughland (2014)	Cross-sectional case control	1. a) yes with independent validation* 2. b) potential for selection bias 3. Community controls * 4. no history of disease*	1. a) no factors controlled for	1. b) structured assessment blind to case/control * 2. a) yes* 3. a) same for both groups*	N/A
5.	Fertuck, Jekal, Song, Wyman, Morris, Wilson, Brodsky & Stanley (2009)	Cross-sectional case control	1. a) Yes with independent validation* 2. b) not stated 3. a) community controls * 4. a) no history of trauma *	1. b) study controls for gender and depression *	1. b) structured assessment blind to case/control * 2. a) yes* 3. a) same for both groups*	
6.	Germine, Dunn, McLaughlin & Smoller (2015)	Cross-sectional cohort	1. a) truly representative of the general population* 2. a) drawn from same community * 3. b) structured interview * 4. no cross-sectional	1. a) study controls IQ * b) study controls for other areas of social cognition. *	N/A	1.a) independent blind assessment* 2. N/A 3. N/A
7.	Gibb, Scofield and Coles (2009)	Cross-sectional cohort	1. c) selected group of users (university students) 2. a) drawn from same community as exposed cohort * 3. b) Structured interview *	1. no key factors controlled for	N/A	1. a) independent blind assessment * 2. b) no cross-sectional 3. no cross-sectional

			4. b) no cross-sectional			
8.	Lieslehto, Kiviniemi, Maki, Koivukangas, Nordstrom, Miettunen, Barnett,Jones, Murray, Moilanen, Paus & Veijola (2017)	Cross-sectional cohort	1. d) no description 2. c) no description 3. c) self-report 4. b) no cross-sectional	1. no key factors controlled for		1. c) self report 2. b) no cross-sectional 3. no cross-sectional.
9.	Lowyck, Lutyen, Vanwalleghem, Vermote, Mayes &Crowley (2015)	Cross-sectional case control	1. b) self reports 2. a) representative sample* 3. a) community controls * 4. b) unknown trauma history at recruitment	1. b) controls for depression and other psychiatric diagnoses. *	1. b) blind to case/control status * 2. a) yes * 3. a) same rate for both groups *	N/A
10.	Nicol, Pope & Hall (2014)	Cross-sectional case control	1. b) self report 2. b) not stated 3. a) community controls * 4. no description of trauma history.	1. no key factors controlled for	1. a) structured assessment blind to case/control status. * 2. a) yes* 3. a) same rate for both groups*	N/A
11.	Pick, Mellers & Goldstein (2016)	Cross-sectional case control	1. b) self report 2. a) representative sample * 3. a) community controls	1. b) depression / anxiety controlled for *	1. b) structured assessment blind to case/control status 2. a) yes* 3. a) yes*	N/A

			4. a) no description of trauma history			
12.	Preißler, Dziobek, Ritter, Heekeren & Roepke (2010)	Cross-sectional case control	1. a) yes with independent validation* 2. a) representative sample * 3. Community controls * 4. a) no history of trauma *	1. no key factors controlled for.	1. b) structured assessment blind to case control status * 2. a) yes * 3. a) same for both groups *	
13.	Russo, Mahon, Shanahan, Solon, Ramjas, Turpin & Burdick (2015)	Cross-sectional cohort	1. a) somewhat representative of people with bipolar * 2. a) from same community as exposed cohort * 3. b) structured interview * 4. b) no cross-sectional.	1. a) study controls for cognition * b) study controls for age and illness duration*	1. a) structured blind assessment* 2. b) no cross-sectional 3. no cross-sectional.	
14.	Suzuki, Poon, Kumari & Cleare (2015)	Cross-sectional case control	1. b) yes self report 2. a) representative sample * 3. community controls * 4. no history of abuse *	1. b) study controls for depression status *	1. a) Structured assessment blind to case/control status* 2. a) yes* 3. a) same rate for both groups *	N/A
15.	Wagner & Linehan (1999)	Cross-sectional case control	1. b) self report 2. a) representative sample* 3. a) community controls *	1. a) study controls for IQ *	1. b) structured assessment blind to case/control status * 2. yes *	N/A

		4. a) no history of abuse or BPD *		3. a) same for both groups *	
16. Young & Wisdom (2014)	Prospective cohort study	1. a) truly representative of abused people* 2. controls drawn from same community * 3. a) secure court records* 4. a) yes *	1. a) study controls for IQ * b) study controls for age, sex and socioeconomic status. *		1. Independent assessment blind to exposure status.* 2. Yes follow up from childhood to adulthood * 3. Subjects lost to follow up (<40%) unlikely to introduce bias due to sample size. *

†Selection 1. Representativeness of exposed cohort; 2. Selection of non-exposed cohort; 3.Ascertainment of exposure; 4. Demonstration that outcome of interest was not present at start. (maximum 4 stars) Selection for case control studies 1. Is the case definition adequate?; 2. Representativeness of the cases; 3.Selection of controls; 4. Definition of controls. (maximum 4 stars) ¥ Comparability of cohorts on the basis of the design or analysis. (maximum 2) star) ʊ Exposure 1. Ascertainment of exposure; 2. Same method of ascertainment for cases and controls; 3. Non-response rate. (maximum 3 stars). ł Outcome 1. Assessment of outcome; 2. Was follow up long enough for outcomes to occur; 3. Adequacy of follow up cohorts. (maximum 3 stars)

Appendix 2.1

Ethics application

ETHICS Form Psychology

Please use the tick boxes provided to indicate when the following items have been completed

If appropriate, have you discussed this application with your Supervisor/Grant-holder ☒

If applicable, attached copies of your consent documents ☒

If applicable, attached copies of any letters to participants ☒

Attached a copy of your debriefing statement ☒

If applicable, have you attached a copy of the questionnaire/s you intend to use? ☒

Attached a copy of your risk assessment ☒

If applicable, attached a copy of your eFolio advert and other forms of recruitment ☐

DEPARTMENT OF PSYCHOLOGY

OUTLINE OF PROPOSED RESEARCH TO BE SUBMITTED FOR

ETHICAL COMMITTEE APPROVAL

PLEASE NOTE: You will need to discuss this form with your Supervisor or Grant-holder. In particular, you should ask him/her for any School guidelines relating to this area of research which you must read and understand. You should also read and understand the Ethical Principles for Conducting Research with Human Participants published by the British Psychological Society.

You must not begin your study until School of Psychology ethical and Research Governance Office approval have been obtained. Failure to comply with this policy could constitute a disciplinary breach.

1. Name(s): Dr Kate Hodgson and Miss Stephanie Smith

2. Supervisor: Dr Nick Maguire

3. How may you be contacted (e-mail and/or phone number)? Kh1g15@soton.ac.uk and Sas1v13@soton.ac.uk

4. Into which category does your research fall?

Undergraduate Student Research ☐

Postgraduate Student Research ☒

Staff Research ☐

5. Title of Project:

The impact of childhood experiences on people experiencing homelessness

6. Briefly describe the rationale for carrying out this project and its specific aims and hypotheses

This project with incorporate two DClinPsyc thesis projects, both of which are concerned with the impact of childhood experiences on the lives of people experiencing homelessness. Miss Stephanie Smith will be exploring the relationship between childhood adversity, attachment and impulsivity, whilst Dr Kate Hodgson will be exploring

the relationship between childhood adversity, facial emotion recognition, emotion regulation and maladaptive behaviours.

Rationale

Homelessness continues to be a growing problem in the UK, with recent figures showing 68,560 households in temporary accommodation and 3,569 individuals sleeping rough in England on any given night (Homeless Link, 2016). Whilst this population is seen as highly heterogeneous (Victor, 1997), an interplay between common factors on both a macro (i.e., poverty, lack of affordable housing, lack of employment) and micro level (i.e., personal vulnerabilities) are recognised in the development and maintenance of homelessness (Morrell-Bellai, Goering, & Boydell, 2000).

On a micro level, it is well documented that childhood adversity, including sexual, physical, emotional abuse and neglect is disproportionately high within homeless populations and comparable to other clinical groups (i.e., approximately twice that of the general public; Patterson, Moniruzzaman & Somers, 2014; Maguire, Keats & Sambrook, 2006). Furthermore, childhood adversity has consistently been linked to subsequent mental health problems and certain maladaptive behaviour; both of which are prevalent within the homeless population (Goldstein, Luther & Haas, 2012).

Childhood trauma, attachment and impulsivity (Stephanie Smith's thesis project)

Research exploring the underlying mechanisms linking childhood adversity and maladaptive behaviours (and the mental health difficulties associated with them) have identified impulsivity as a potential mediating variable (Cicchetti, Rogosch & Thibodeau, 2012), with impulsivity being independently linked to both abuse (e.g., Daray *et al*., 2016) and maladaptive behaviours, including substance abuse and sexual risk behaviours (Perry & Carroll, 2008). Furthermore, within the homeless population, impulsivity difficulties have also been reported as a key factor in the problematic behaviours which lead to homelessness (Maddock, Hevey, & Eidenmueller, 2016) and as a mediating variable between childhood trauma and maladaptive behaviours (Dowling, 2014). However, the precise manner by which childhood adversity contributes to impulsive -like traits and subsequent maladaptive behaviours has yet to be studied in detail.

Attachment theory offers a useful framework for understanding this relationship; with insecure attachment styles (i.e., associated with inconsistent or unresponsive care-giving) commonly being associated with childhood abuse or neglect (Brassard, Darveau, Peloquin, Lussier, & Shaver, 2014), psychopathology and maladaptive behaviours in

adults (Mikulincer & Shaver, 2012), and unsurprisingly the homeless population (Dowling, 2014).

In light of attachment's role in an individual's capacity to regulate behaviour and affect (Levy, 2005), preliminary associations between impulsivity difficulties and insecure attachment have also been established (Levy, Clarkin, Yeomans, Scott, Wasserman & Kernberg, 2006). However, it is thought that these difficulties may differ between specific insecure attachment styles, i.e. insecure anxious attachment, characterised by fears of separation and abandonment (Ainsworth, Blehar, Water & Wall, 1978), is thought to be associated with high levels of impulsivity (Mikulincer & Shaver, 2007), due to the individual defaulting to a hyper-activating strategy to cope in stress-related situations (e.g. hypersensitive proximity seeking behaviours; Mikulincer & Shaver, 2007). Whereas, insecure avoidant attachment, characterised by discomfort with intimacy and dependency (Ainsworth *et al*., 1978), is thought to be associated with extremely low levels of impulsivity (i.e., 'over controlled'; Fossati *et al*., 2005); which is considered equally as maladaptive (Letzring, Block & Funder, 2005). In stress-related situations, these individuals instead default to de-activating strategies such as inhibition of emotional expressivity and withdrawal (Fossati *et al*., 2005).

Despite a strong theoretical basis, there is a lack of empirical support for the relationship between attachment and impulsivity, particularly within populations typified by high levels of childhood adversity and behavioural difficulties. Furthermore, attachment research has largely focused on the three primary attachment styles, i.e., secure, insecure- anxious and insecure-avoidant (Ainsworth *et al*., 1978). However, disorganised attachment, labelled a third insecure category and characterised by a lack of coherent attachment strategy (Hocking, Simons, & Surette, 2016), has been highly correlated to externalising behaviours (e.g., aggression; Lecompte & Moss, 2014) and childhood maltreatment (Schimmenti & Bifulco, 2015). Consequently, whilst limited research currently exists, this attachment style may be particularly salient within the homeless population.

Therefore this project aims to further investigate levels of insecure attachment (including disorganised attachment) within the proposed sample population and explore its influence on the factors implicated in the development and maintenance of homelessness, namely childhood adversity and impulsivity. More specifically this study will test the following hypotheses:

a) There will be significant associations between childhood adversity, insecure attachment (i.e. disorganised, anxious and avoidant) and impulsivity.
b) The relationship between childhood adversity and impulsivity will be partially mediated by insecure attachment styles. Anxious attachment will partially mediate the relationship between childhood adversity and high levels of impulsivity. Whereas avoidant attachment will partially mediate the relationship between childhood adversity and low levels of impulsivity.

Childhood adversity, facial emotion recognition, emotion regulation and maladaptive behaviour (Kate Hodgson's thesis project)

Homelessness represents one of the most extreme forms of social exclusion (Hodgson, Shelton, van den Bree, & Los, 2013). People who are homelessness have often experienced adversity in childhood (Hodgson *et al*., 2015).These experiences in early life are often then compounded by further traumatic experiences that may occur as a result of becoming homeless (McMannus & Thompson, 2008; Marpsat *et al*., 2000). Whilst there are a number of macro societal and environmental factors implicated in repeat and chronic homelessness; people with complex histories and maladaptive coping strategies are at greater risk of becoming stuck in the 'revolving door' of homelessness. The behaviour they display can result in repeated tenancy loss (Johnson & Chamberlain 2008a; (Kertesz *et al*., 2003)

People who experience homelessness are likely to have experienced adversity in childhood and throughout their lives (McMannus & Thompson, 2008). This is recognised as having a significant impact future mental health and future behaviour in this group (Hodgson, Shelton & van den Bree, 2015). The dysfunctional experiences of relationships that children who have experienced adversity may have, are likely to lead to deficits in skills that develop as a result of care and secure relationships with caregivers (Cassidy, 1994; Schore & Schore, 2008;Kessler, Davis & Kendler, 1997;). For example, ability to understand, read and regulate emotions in the self and others (Elhert, 2013; Fairchild, Van Goozen, Calder, Stollery, & Goodyer, 2009).

Facial emotion recognition is a skill important for social interaction. It has been shown that young people with conduct problems and people who have committed criminal offences often have deficits in the ability to recognise negative emotions in others (E. Bowen & Dixon, 2010; Fairchild *et al*., 2009; Hoaken, Allaby, & Earle, 2007). Furthermore, people who have autism also show deficits in recognising emotions (Castelli, 2005). People with Borderline Personality Disorder (BPD) also show deficits in

recognising emotions when they are in an emotionally dysregulated state. However, when not experiencing heightened emotion people diagnosed with BPD can be hyper-sensitive to recognising emotion (Schulze, Domes, Köppen, & Herpertz, 2013).

Emotion regulation has also been shown to be impaired in people who use maladaptive coping strategies and behaviours. This is thought to perhaps be a way of managing strong emotions (Gratz & Roemer, 2004; Jakupcak, Lisak & Roemer, 2002; Bushman, Baumeister & Phillips, 2002). People with difficulties in emotion regulation and emotion recognition often have difficulties in social interaction and coping in social situations. Facial emotion recognition and emotion regulation are skills that are thought at least in part to develop as a result of parent/child interaction (Fairchild, Snoek, & Harold, 2007; Gratz & Roemer, 2004). Indicating the importance of child-caregiver interactions. Adversity in childhood has been shown to disrupt this development (Cassidy, Parke, Butkovsky & Braungart, 1992).

Some maladaptive behaviours may occur partly as a result of inability to read emotional situations accurately or to regulate one's own emotions (Bowen, Morgan, Moore & van Goozen, 2014; Gratz & Roemer, 2004). Maladaptive behaviours have been defined as behaviours interfere with everyday functioning, that are potentially damaging to self or others and are socially defined as a problem that often elicits a social control response (Kingston, 2009). Maladaptive behaviours seen in the homeless population are varied but can often involve use of substances, involvement in un-healthy relationships, impulsivity and criminality. These behaviours often result in the perpetuation of homelessness meaning people lose tenancies or are unable to access support to help them move out of homelessness (Philippot, Lecocq, Sempoux, Nachtergael, & Galand, 2007; Taylor, Stuttaford, Broad, & Vostanis, 2006; Tyler, Melander, & Noel, 2009).

This project aims to investigate the role of facial emotion recognition and emotion regulation in the relationship between adverse childhood experiences and maladaptive behaviours seen in a sample of people currently experiencing homelessness. Specifically, the study will aim to explore following hypotheses:

a) There will be a significant positive relationship between experiences of childhood adversity and maladaptive behaviours.
b) The relationship between adversity in childhood and maladaptive behaviour in homeless people will be partially mediated by ability to recognise facial emotions and/or the ability to regulate own emotions.

7. What intervention/procedure will be used? (Briefly describe the design. Explain what participants will experience, including duration of any task/test).

This study will use a cross-sectional correlation and mediation design

Interested participants will be seen by the researcher(s) and given a verbal overview of the study alongside written information and consent forms, including clear explanations around confidentiality, anonymity, risk and right to withdraw. Participants will then be asked to give written consent, given time to ask any questions and an initial measure of distress to complete. Participants will then be given a questionnaire pack and depending on personal preferences asked to complete this independently, with some help or in an interview format (i.e. each question read aloud) in a separate room. Whilst the questionnaires within the pack will be randomised (e.g. to reduce response bias) the ACE will be placed towards the middle of the pack due to the potentially distressing nature of the questions. In addition participants will all complete a computerised facial emotion recognition task, at some point whilst completing the questionnaire pack. Participants will be provided with a mood-repair task at the end of the questionnaire pack followed a second measure of distress. Participants will then be given both a verbal and written debrief. Participation will last approximately between 30 minutes and one hour and a £6 food voucher as compensation for their time.

8. What measurement procedures will be used? Please attach copies of any questionnaires to be used.

- Adverse Childhood Experiences Questionnaire (ACE; Dube, Felitti, Dong, Chapman, Giles & Anda, 2003; Felitti *et al*., 1998).
- The Experiences in Close Relationships – Revised (ECR-R; Fraley, Waller, & Brennan, 2000).
- Adult Disorganised Attachment Scale (ADA; Paetzold, Rholes & Kohn, 2015).
- The Barratt Impulsiveness Scale (BIS-11; Patton, Stanford & Barratt, 1995).
- Facial Emotion Recognition will be assessed using a short computerised test (Bowen, Morgan, Moore & van Goozen 2013). The Facial Emotion Recognition (FER) task was made using the application Medialab (Jarvis, 2014) and consisted of a series of 150 slides displaying facial expressions drawn from Ekman and Friesen's (1975) facial affect battery.
- Composite Measure of Problem Behaviours (Kingston, Clarke, Ritchie & Remington, 2011)
- Difficulties in emotion regulation scale (DERS) (Gratz & Roemer, 2004)
- Wechsler Test of Adult Reading (WTAR) (Holdnack, 2001)
- A demographic questionnaire of participant characteristics

- A visual analogue scale of subjective distress.
- Mood repair task rating the participant's perception of how humorous a cartoon/joke is.

9. Who are the participants?

Participants will be an opportunity sample recruited from homeless hostels in and around Southampton. Both male and female adults (aged 16 years and above) who are considered homeless (i.e. anyone without permanent accommodation, including homeless hostels, shelters, rough sleepers and any other form of temporary accommodation) will be considered eligible to participate. Participants will only be excluded if they are unable to understand spoken English (for written English difficulties the option to have questionnaires read to them will be offered), they demonstrate an inability to recall childhood experiences, and/or they present as under the influence of drugs/alcohol to an extent that would impair their ability to participate.

A control group of up to thirty adults aged 16 years or above will also be recruited for the purpose of comparison on the skill of emotion recognition. The control group will complete the Facial Emotion Recognition task (FER) (Bowen, Morgan, Moore & van Goozen 2013) using the application Medialab (Jarvis, 2014). They will also complete the WTAR Wechsler Test of Adult Reading (WTAR) (Holdnack, 2001) as well as the demographic questionnaire of participant characteristics. The control group will not complete any of the other measures.

10. How many participants will you recruit?

In order to conduct a study with sufficient power the minimum target number of participants for the present study is 79 (Fritz and Mackinnon, 2007), therefore we aim to recruit between 79 and 90 participants from the homeless population. 30 adults who are not homeless will also be recruited as a control group for comparison on the Facial Emotion Recognition task.

11. How will they be identified, approached and recruited?

Service managers of prospective homeless hostels will be initially approached to discuss the planned research and gain consent to approach service users. On agreement, each service will then be provided with posters and information sheets (including the planned data collection dates/times) in order to advertise the study to residents and staff.

It is proposed that a ‘drop-in’ format to data collection will be adopted at the hostels in order to maximise recruitment.

Control participants will be recruited as a sample from the general population. The control sample will be age matched to the homeless sample so will be collected following completion of the recruitment of the homeless sample. They will be 16 years old plus and have no experience of homelessness (Current or past). Participants will be approached within the university through handing out of information about the study (information sheet) and posters. A snowball sampling technique will follow this allowing identification of further participants of certain age groups to match the homeless sample.

12. How will you obtain the consent of participants?

(Please attach a copy of the consent form if obtaining written consent)

Participants will be given a verbal overview of the study alongside written information and consent forms, including clear explanations around confidentiality, anonymity, risk and right to withdraw. Participants will then be asked to give written consent and given time to ask any questions.

13. Is there any reason to believe participants may not be able to give full informed consent?

Yes ☐ **No** ☒

If yes, what steps do you propose to take to safeguard their interests?

14. If participants are under the responsibility of others (such as parents/carers, teachers or medical staff) have you obtained permission to approach the participants to take part in the study?

Yes ☐ **No** ☐ **N/A** ☒

15. Detail any possible discomfort, inconvenience or other adverse effects the participants may experience, including after the study, and how this will be dealt with.

Due to the nature of some of the questionnaires and the potential vulnerability of the participants, strategies will be implemented to reduce possible distress. Beyond the implementation of a mood repair task and a thorough information giving/debrief process, the researcher(s) will remain vigilant to any signs of distress throughout the data collection and will ask participants to complete visual analogue scales of distress pre and post to check for increased levels of distress. With any concerns being followed up by the researcher(s) and/or hostel staff. Furthermore, a

Clinical Psychologist supervising the study and experienced with working with the homeless will be available for consultation/support if necessary, with their contact details being provided on debrief forms.

Whilst we recognise some of the measures may induce a level of distress in the participants, we feel that the procedures mentioned above including the mood repair task will sufficiently mitigate any distress caused. Due to the lack of research about this vulnerable group we believe the risk of any distress is justified by the importance of exploring the needs of homeless individuals. By understanding more about this population services will be able to develop new ways of providing appropriate support in the future.

The control sample are not expected to experience distress as they will only be completing the FER task and the WTAR. Neither of which contain any potentially distressing elements. If any distress was elicited during the interview and FER task then it would be stopped and support offered by the researchers in the same way as for the homeless sample.

16. How will it be made clear to participants that they may withdraw consent to participate at any time without penalty?

The participant's right to withdraw is included in the consent form and debrief. Furthermore, this will be given verbally both at the beginning and end of the study.

17. Will the procedure involve deception of any sort?

Yes ☐ **No** ☒

If yes, what is your justification?

18. How do you propose to debrief participants and/or provide them with information about the findings of the study? *(Please attach a copy of your debriefing statement)*

Participants will be given both a verbal and written debrief after completing the study. In addition, the findings of the study will be fed back to the hostels where participants were recruited and contact details will also be provided should participants want further information.

19. How will information obtained from or about participants be protected?

Participant's identity will be protected using a linked anonymous procedure. A participant's consent form will be linked to their questionnaire pack using an anonymous

code. Completed questionnaires will be transported in a locked briefcase and stored in a locked filing cabinet once returned to the university. Throughout the project, uploaded data will be securely stored on a password-protected computer and this will be the same throughout the analysis process. If data is taken out of the university setting particularly during the write-up phase of this project a password protected memory stick will be used to transfer this information onto another password-protected computer. It is important to note that any information taken out of this setting will be anonymised and will not contain any patient identifiable information. This data will be retained in the university after the end of this project for 3 years and any information removed from this setting will be destroyed after the write-up of the project is completed.

20. Experimental apparatus employed must be approved for safety by a member of the School of Psychology technical team. Has this approval been given?

Yes ☒ **No** ☐

21. Do you intend to make a submission through the NRES? ***(certain projects may need NRES approval, please check with your supervisor)***

Yes ☐ **No** ☒

22. Does this research involve work with children?

Yes ☐ **No** ☒

If yes, has a DBS check been carried out?

Yes ☐ **No** ☐

23. Outline any other information you feel may be relevant to this submission.

Appendix 2.2

Demographic questionnaire

UNIVERSITY OF Southampton

Demographic Data

- ☐ Male
- ☐ Female

- Age: _____

- How many years of full time education (including school, college, university) .....

- Did you ever require additional support with your learning at school? Yes/No (please delete as appropriate)

  If yes please provide details:
  .....
  .....
  .....
  .....
  .....
  .....
  .....

- What qualifications do you have? Please provide details:
  .....
  .....
  .....
  .....
  .....
  .....
  .....

- Ethnicity: (Please tick one box)

White	Black	Asian	Mixed
☐ British	☐ African	☐ Bangladeshi	☐ White + Black African
☐ Irish	☐ Caribbean	☐ Pakistani	☐ White + Black Caribbean
☐ Other	☐ Other	☐ Indian	☐ White + Asian
		☐ Chinese	☐ Black + Asian
		☐ Other	☐ Other

- What is your current circumstances with regards to accommodation? (Please tick one box)

☐ sleeping on the streets ☐ staying in a squat ☐ staying in a shelter
☐ in derelict buildings ☐ Staying on friends sofa's ☐ Staying in homeless hostel
☐ other outdoor …… ☐ Overcrowded housing ☐ Other ……

- When was the first time you became homeless? Approximate date

  _____

- How old were you when you first became homeless? Approximate age

  _____

- Roughly how many different times have you been homeless? Approximately

  _____ times.

- Roughly how long have you been homeless this time? Approx. _____years _____ months.

Appendix 2.3

Adverse Childhood Experiences Scale

While you were growing up, during your first 18 years of life:		
1. Did a parent or other adult in the household **often** … Swear at you, insult you, put you down, or humiliate you? **or** Act in a way that made you afraid that you might be physically hurt?	YES	NO
2. Did a parent or other adult in the household **often** … Push, grab, slap, or throw something at you? **or** **Ever** hit you so hard that you had marks or were injured?	YES	NO
3. Did an adult or person at least 5 years older than you **ever**… Touch or fondle you or have you touch their body in a sexual way? **Or** Attempt to or actually have any type of sexual intercourse with you?	YES	NO
4. Did you **often** feel that … No one in your family loved you or thought you were important or special? **or** Your family didn't look out for each other, feel close to each other, or support each other?	YES	NO
5. Did you **often** feel that … You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? **or** Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?	YES	NO
6. Were your parents **ever** separated or divorced?	YES	NO
7. Was your mother or stepmother: **Often** pushed, grabbed, slapped, or had something thrown at her? **or** **Sometimes or often** kicked, bitten, hit with a fist, or hit with something hard? **or** **Ever** repeatedly hit over at least a few minutes or threatened with a gun or knife?	YES	NO
8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?	YES	NO
9. Was a household member depressed or mentally ill or did a household member attempt suicide?	YES	NO
10. Did a household member go to prison?	YES	NO

Appendix 2.4

Composite Measure of Problem Behaviours

Maladaptive behaviours Questionnaire

This questionnaire is designed to ask you about a range of behaviours that you may, or may not, engage in. It includes 46 statements and you are required to rate the extent to which each statement characterises you, using the scale below

1	2	3	4	5	6
Very unlike me	Quite unlike me	A little unlike me	A little like me	Quite like me	Very like me

For example, if you read a statement and think "it's very unlike me to do X" you would write a "1" next to the statement. If you think "that's only very slightly like me" write '4', or if you think "it's very like me to do that", write '6'.

Before completing the questionnaire, please take note of the following points: Where questions refer to internet use, this means non-work related use such as chat rooms, surfing the net etc. Where questions refer to sexual behaviours, this includes both foreplay and all forms of sexual intercourse. Where questions refer to drugs, this means the use of illegal drugs. This would include, for example, Cannabis, Cocaine, Ecstasy etc. Where questions refer to smoking, this means tobacco.

Please read each statement carefully and answer as honestly as possible. All answers are anonymous. Please do not leave any answers blank.

		1. very unlike me	2. Quite unlike me	3. A little unlike me	4. A little like me	5. Quite like me	6. Very like me
1	**It's like me to say no to drugs** (this includes cannabis)	1	2	3	4	5	6
2	**It's like me to be pre-**occupied by thoughts about smoking when smoking is prohibited	1	2	3	4	5	6
3	**It's like me to sometimes consume more than 6** alcoholic drinks in one evening	1	2	3	4	5	6
4	**It's like me to ignore dietary details (e.g., calorie** content) when choosing something to eat	1	2	3	4	5	6
5	**It's like me to exercise even when I am feeling**	1	2	3	4	5	6

	tired and/or unwell	
6	**It's like me to sometimes intentionally prevent** scars or wounds from healing	1 2 3 4 5 6
7	**It's like me to smoke tobacco**	1 2 3 4 5 6
8	**It's like me to** surf the net/play computer games before doing something else that needs doing	1 2 3 4 5 6
9	**It's like me to generally have no** interest in taking drugs (this includes cannabis)	1 2 3 4 5 6
10	**It's like me to sometimes engage in sexual** activities with someone I have only just met	1 2 3 4 5 6
		1. very unlike me / **2. Quite unlike me** / **3. A little unlike me** / **4. A little like me** / **5. Quite like me** / **6. Very like me**
11	**It's like me to find that my work performance or** productivity suffers because of my internet/video game use	1 2 3 4 5 6
12	**It's like me to never resort to violence**	1 2 3 4 5 6
13	**It's like me to sometimes actively seek out drugs** for personal use (this includes cannabis).	1 2 3 4 5 6
14	**It's like me to feel irritation/frustration if I am in a** non-smoking environment.	1 2 3 4 5 6
15	**It's like me to sometimes scratch or bite myself to** the point of scarring or bleeding	1 2 3 4 5 6
16	**It's like me to sometimes feel pre-**occupied with the internet/computer games	1 2 3 4 5 6
17	**It's like me to skip doing exercise for no good** reason	1 2 3 4 5 6
18	**It's like me to drink a lot more alcohol than I** initially intended	1 2 3 4 5 6
19	**It's like me to have a long list of things that I dare** not eat.	1 2 3 4 5 6

20	It's like me to feel excitement and/or tension in anticipation of getting drunk	1 2 3 4 5 6
21	It's like me to be content if I am prevented from exercising for a week	1 2 3 4 5 6
22	It's like me to always stop eating when I feel full	1 2 3 4 5 6
23	It's like me to prefer being in places where smoking is prohibited	1 2 3 4 5 6
24	It's like me to control my temper	1 2 3 4 5 6
25	It's like me to deliberately take small helpings as a means of controlling my weight	1 2 3 4 5 6
26	It's like me to exercise more than three times a week	1 2 3 4 5 6
27	It's like me to sometimes eat to the point of physical discomfort	1 2 3 4 5 6
28	It's like me to sometimes feel tension and/or excitement in anticipation of doing exercise	1 2 3 4 5 6
29	It's like me to sometimes cause myself direct bodily harm by, for example, cutting or burning myself	1 2 3 4 5 6
30	It's like me to only eat when I am hungry	1 2 3 4 5 6
		1. very unlike me / **2. Quite unlike me** / **3. A little unlike** / **4. A little like me** / **5. Quite like me** / **6. Very like me**
31	It's like me to unsuccessfully try to cut back my use of the internet/computer games	1 2 3 4 5 6
32	It's like me to be excited by the opportunity of taking drugs (this includes cannabis)	1 2 3 4 5 6
33	It's like me to sometimes get so angry that I break something	1 2 3 4 5 6
34	It's like me to sometimes have more than one sexual partner	1 2 3 4 5 6
35	It's like me to sometimes engage in sexual actives	1 2 3 4 5 6

	with someone when really I shouldn't	
36	It's like me to easily limit my use of the internet or video games	1 2 3 4 5 6
37	It's like me to feel the urge to have a cigarette.	1 2 3 4 5 6
38	It's like me to sometimes feel that I need to take drugs (this includes cannabis)	1 2 3 4 5 6
39	It's like me to go out with friends who are drinking, but opt to stay sober	1 2 3 4 5 6
40	It's like me to sometimes think that I might have a drugs problem (this includes cannabis).	1 2 3 4 5 6
41	It's like me to avoid eating when I am hungry	1 2 3 4 5 6
42	It's like me to find it difficult to stop eating after certain foods	1 2 3 4 5 6
43	It's like me to be aggressive when sufficiently provoked	1 2 3 4 5 6
44	It's like me to feel the urge to intentionally harm myself	1 2 3 4 5 6
45	It's like me to sometimes feel that I need an alcoholic drink	1 2 3 4 5 6
46	It's like me to sometimes claim I have already eaten when this is not true	1 2 3 4 5 6

Kingston, J. L., Clarke, S., Ritchie, T., & Remington, B. (2011). Developing and validating the "composite measure of problem behaviors". *Journal of Clinical Psychology, 67*, 736-751.

Appendix 2.5: *Correlation between maladaptive behaviours and facial emotion recognition*

	FER Total	FER Happy	FER Sad	FER Fear	FER Anger	FER Disgust	FER Surprise	FER Neutral	FER 25%	FER 50%	FER 75%	FER 100%
CMPB total	-.032	-.086	.047	.016	.109	-0.189	.013	-.038	-.017	0.018	.036	-.123
CMPB Drug use	.025	.025	.064	-.109	.007	-.023	.094	.140	-.064	.034	.065	-.017
CMPB Alcohol use	.046	-.077	-.025	.114	.203	-.006	-.013	.030	.058	.056	.046	.007
CMPB self-harm	-.047	.049	.059	-.148	.083	-.230*	.007	.035	-.026	-.026	-.003	-.099
CMPB restrictive eating	-.071	-.201	.104	.036	.029	-.085	-.090	-.171	.073	-.045	-.023	-.138
CMPB binging	-.193	.026	-.234*	-.140	-.106	-.178	-.154	-.060	-.036	-.159	-.198	-.218*
CMPB sexual promiscuity	-.038	-.076	.008	-.090	.064	-.011	-.005	-.092	-.076	.023	-.017	-.042
CMPB excessive exercise	-.056	-.114	.019	.230*	-.134	-.081	-.077	-.203	.077	-.010	-.049	-.103
CMPB aggression	-.002	-.050	-.035	.082	.177	-.188	.012	.050	-.093	-.030	.066	-.014
CMPB internet overuse	-.065	-.072	.065	-.101	-.071	-.155	.120	-.102	-.074	.042	-.046	-.106
CMPB smoking	-.145	.079	.088	.167	.182	.033	.046	.044	.070	.091	.207	.092

Note: *p<.05, **p<.001

Appendix 2.6

Recruitment Poster

Would you like to take part in a research study?

And receive a £6 Love 2 Shop Voucher

To find out more please take a flyer or speak to a member of staff

We are Trainee Clinical Psychologists looking at the impact of childhood experiences on people with experience of homelessness. We are hoping that our research will help develop understanding of some of the difficulties that homeless people face, and contribute to improving the services available to homeless people.

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Appendix 2.7

Participant information sheet

Participant Information Sheet

Study Title: The impact of childhood experiences on people experiencing homelessness

Researcher: Dr Kate Hodgson and Miss Stephanie Smith

ERGO number: 26424

You are being asked if you would agree to take part in an evaluation that is entirely separate from the support you are currently receiving. Before you decide if you wish to participate, it is important that you understand why the research is being carried out and what it will involve. Please read this information carefully before deciding to take part in this research. It is up to you to decide whether or not to take part. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

This research project incorporates two Doctorate in Clinical Psychology thesis projects, both of which exploring the impact of childhood experiences on the lives of people experiencing homelessness. Stephanie Smith will be exploring the relationship between difficult childhood experiences, relationships with others and impulsivity, whilst Kate Hodgson will be exploring the relationship between difficult childhood experiences, facial emotion recognition and unhelpful behaviours.

Why have I been asked to participate?

We are approaching you to take part in this research because you have been identified as a service user of a homeless hostel or of supported accommodation for homeless people.

What will happen to me if I take part?

You will be asked to complete set of questionnaires and a short computer task looking at faces. In total this should take no longer than 1 hour. The questionnaires will ask you about your childhood experiences, your relationships, impulsivity and emotional control.

The data that we collect will only be accessed by those working on the project, and will be stored securely for a period of 10 years, after which it will be securely destroyed. Your data will be stored anonymously and will be kept on a password protected computer All data use is strictly within the terms of the Data Protection Act (DPA, 1998).

Are there any benefits in my taking part?

You will receive a £6 voucher in return for your time if you decide to take part. By taking part in this research you will help us to better understand homelessness and the difficulties that can come with this. This information may be helpful for services and for supporting individuals experiencing homelessness in future.

Are there any risks involved?

It's possible that you might find completion of the questionnaires a little upsetting. The questionnaires will ask you questions about your childhood, including questions about experiences of abuse or neglect for example *'Did an parent or other adult often push, grab, slap or throw something at you?'*

Some questions will also ask you about your past/current drug/alcohol use and your past/current accommodation situation. If you do feel distressed after taking part, the researchers administering the questionnaires will provide you with a few points of contact who you can turn to for support, or to discuss your feelings in greater detail. These points of contact and support are included on the debriefing form which the researchers will give to you at the end of the questionnaires. The researchers are also able to answer any questions you have about the research or you can contact Nick Maguire at the University of Southampton, for more detail, by telephone: 02380597760, or email: nick.maguire@soton.ac.uk .

Will my participation be confidential?

All information that is collected about you during the course of the evaluation will be kept strictly confidential. All collected information that is connected to you will have your name and address removed so that you cannot be recognised from it. We will, instead, identify you using a randomly generated number. There will be an encrypted file stored on a password protected computer that will link your name and address to your identifying number. We need to do this in case you decide you do not want to be part of the study at a later date, in which case we can then remove your data. No one apart from those directly involved in the project will be able to access this information. It might be important to look at the data in years to come, so we will keep it for 10 years and then it will be destroyed. All data use is strictly within the terms of the Data Protection Act (DPA, 1998).

If you disclose a significant risk to yourself or others, then it becomes our duty of care to report this as part of safeguarding adults and vulnerable people. We will discuss this with you first, and support you to report this to your hostel manager and/or your key worker who will then advise you on what action is required, in line with their safeguarding procedures.

What should I do if I want to take part?

If you would like to take part, then you will next need to sign the consent form and inform the researchers that you are happy to take part. If you are reading this information

outside of a participation session, then you can let staff at the hostel know you are interested and then can pass on your details to the researchers.

What happens if I change my mind?

You have the right to withdraw yourself from the study as well as your data. Your legal rights, and routine care will not be affected by you making this decision.

What will happen to the results of the research?

This research will be written up as an academic research paper and submitted for publication in a peer reviewed journal. It will also be submitted as part of the researcher's doctoral thesis. If you would like to receive a copy of the results please let the researchers know. The anonymised results will be provided to hostel staff as well.

The data for the project will be stored for 10 years in line with Southampton University Policy.

Where can I get more information?

If you would like more information about the study, or wish to obtain a report on your individual data set, then please contact Dr Nick Maguire:

School of Psychology, University of Southampton, Highfield, Southampton, SO171BJ

Tel: 02380597760

Email: nick.maguire@soton.ac.uk

What happens if something goes wrong?

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO171BJ. Phone: +44 (02380593856), email fshs-rso@soton.ac.uk or the Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

The University has insurance in place to cover its legal liabilities in respect of this study.

Thank you.

Appendix 2.8

Consent form

CONSENT FORM (Version 1.1, 09/06/17)

Study title: The impact of early childhood experiences on people experiencing homelessness.

Researcher name: Kate Hodgson and Stephanie Smith
ERGO number: 26424

Please initial the box(es) if you agree with the statement(s):

I have read and understood the information sheet (09/06/17, Version 1.1) and have had the opportunity to ask questions about the study.	
I agree to take part in this research project and agree for my data to be used for the purpose of this study.	
I understand my participation is voluntary and I may withdraw at any stage for any reason without my rights being affected.	
I understand that my data will be kept anonymous and stored accordingly, However if I report anything to the researchers that suggests that I am at significant risk to myself or others, it is their duty to pass this on to my key worker or a suitable member of staff. I understand that they will speak to me regarding this first, and I may be advised to, or the researcher may have to disclose this to a member of staff on my behalf.	

Data Protection
I understand that information collected about me during my participation in this study will be stored on a password protected computer and that this information will only be used for the purpose of ethically approved research studies.

Name of participant (print name)……

Signature of participant……

Date……
……..

Appendix 2.9

Debrief form

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The impact of early childhood experiences on people experiencing homelessness.
ERGO number: 26424

Debriefing Statement *(written or verbal)*
(Version 1.1, 09/06/17)

Thank you for taking part in this study today and providing us with lots of useful information.

The aim of this research was to investigate the impact of early childhood experiences on the lives of people experiencing homelessness. We were particularly interested in the impact of early childhood experiences on possible factors linked to people becoming and staying homeless. These factors included a person's close relationships, their ability to identify emotions, their ability to control impulses and emotions, and their coping strategies.

It is expected that we will find a relationship between certain childhood experiences and each of these different factors. Your data will help our understanding around how people become and stay homeless. In the future, it is also hoped that your data will help other people who are homeless, or help people avoid becoming homeless altogether.

Once again results of this study will not include your name or any other identifying characteristics. The research did not use any deception. You may have a copy of this summary if you wish and also a summary of the findings of this research once it is completed. If you wish to withdraw from this study at any point please contact the researchers below who will remove your data.

If you have any further questions please contact Kate Hodgson (kh1g15@soton.ac.uk), Stephanie Smith (sas1v13@soton.ac.uk), or Dr Nick Maguire (Nick.Maguire@soton.ac.uk or via telephone at 023 8059 7760).

Thank you for your participation in this research.

Signature _____ Date _____

Name

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: +44 (0)23 8059 3856, email fshs-rso@soton.ac.uk

Due to the nature of some of the questionnaires, you might notice some strong feelings, emotions or thoughts as a result. These are normal experiences. However, if you feel participating has raised any issues/concerns, please let the researchers know. In addition you may find it helpful to talk to staff at the hostel, your doctor, or maybe a friend. Alternatively, we recommend you contact one of the following services:

Mind

Mind provides advice and support to anyone experiencing a mental health problem.

Website: www.mind.org.uk
The local mind service, Solent Mind can be contacted at:

Telephone: 0238 202 7810
Email: info@solentmind.org.uk

Website: www.solentmind.org.uk

Solent Mind

15-16, the Avenue

Southampton

Hants

PTSD Action

This organisation offers advice and other services for anyone who may be affected by post-traumatic stress.
Website: www.ptsdaction.co.uk

Helpline: 01706 591 946 (from 09.00 – 21.00 hours, seven days a week)

The National Association for People Abused in Childhood (napac)

This organisation supports adults who have been affected by abuse. It provides advice and can refer people to local counselling, support and help groups.
Website: www.napac.org.uk
Helpline: 0808 801 0331

Samaritans

The Samaritans run a 24-hour helpline providing emotional support to anyone in distress or who may be struggling to cope.

Appendix 2.10

Mood repair task

How funny are these jokes on a scale of 1-10?

1. What did the pirate say on his 80th birthday?

    a. Aye matey

2. What day does the egg fear the most?

    a. Friday

3. What does a nosey pepper do?

    a. Gets jalapeno business

4. Q: How do you make an Octopus laugh?

    a. With ten-tickles

5. What happens to a frog's car when it breaks down?

    a. It gets toad away.

6. How does a train eat?

    a. It goes chew chew chew

7. What do you call a guy with a rubber toe?

    a. Roberto

8. What's the difference between a dirty bus stop and a lobster with breast implants?

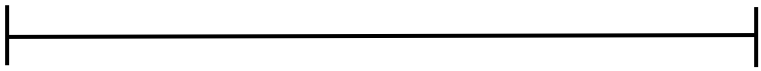
    a. One is a crusty bus station and one is a busty crustacean

Appendix 2.11

Visual analogue scale (measure of distress)

Visual Analogue Scale of Subjective Distress

Please mark on the line below how distressed (upset/angry/worried) you are feeling right now.



Not distressed at all

Very distressed

Appendix 2.12 *Ethics Approval Confirmation*

Approved by Research Integrity and Governance team - ERGO II 32204

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ERGO II – Ethics and Research Governance Online https://www.ergo2.soton.ac.uk

Submission ID: 32204
Submission Title: The impact of early childhood experiences on people experiencing homelessness. (Amendment 3)
Submitter Name: Kate Hodgson

The Research Integrity and Governance team have reviewed and approved your submission.

You can begin your research unless you are still awaiting specific Health and Safety approval (e.g. for a Genetic or Biological Materials Risk Assessment) or external ethics review (e.g. NRES/HRA/MHRA etc).

The following comments have been made:

-

TId: 23012_Email_to_submitter___Approval_from_RIG Id: 16483 kh1g15@soton.ac.uk coordinator