UNIVERSITY OF SOUTHAMPTON

Children Talking About Computers: A Discourse Analysis Perspective on Gender Issues in Information Technology

Jayne Andrea Artis
MA Hons (Edinburgh)

Thesis submitted for the degree of Master of Philosophy
The Department of Psychology

October, 2000

UNIVERSITY OF SOUTHAMPTON

ABSTRACT

FACULTY OF SOCIAL SCIENCES

PSYCHOLOGY

Master of Philosophy

CHILDREN TALKING ABOUT COMPUTERS: A DISCOURSE ANALYSIS PERSPECTIVE ON GENDER ISSUES IN INFORMATION TECHNOLOGY

by Jayne Andrea Artis

This thesis is concerned with gender differences in children's responses to information technology. From primary school onwards girls participate less in computing activities than boys. For researchers attempting to understand these differences one important focus of interest has been children's attitudes towards computers. The vast majority of studies in this area have employed a questionnaire based methodology. However, while this research suggests that there are small but persistent differences in girls and boys attitudes towards computers, it goes little way to helping us understand these differences. This thesis adopted a discursive perspective to address the question of gender differences in response to IT. The analysis is based on a small set of in depth interviews in which 13-14 year olds were asked about their experiences with computers in school and at home. The aim of the analysis was to make explicit some of the rhetorical strategies available to the children for reasoning about their experiences with information technology, and to explore how (if at all) gender mediated these understandings. Although the small number of participants in this study make it difficult to draw any firm conclusions, the analysis suggests that girls and boys responses to computers may be differentiated, not in terms of their overall attitude towards computers, but in terms of their enthusiasm for and participation in different computing activities. The analysis also explored how the children themselves negotiated the significance and meaning of gender in the context of computer technology. The participants drew on the idea that boys were far more frequent and enthusiastic computer game players than girls, and characterised girls and boys preferences for computer games as polarised along traditional gender lines. However, there was strong resistance to the idea that there were any comparable differences in girls and boys interactions with computers in school. Overall, the analysis suggests that the significance of gender varies across different contexts of computer use. Future research should focus on the way gender mediates children's responses to different kinds of computing activities. Such research should differentiate, not only between the use of computers for games and the use of computers for school, but also between the different activities within these two contexts.

CONTENTS

PREFACE

This research was conducted when I was working as a research assistant at the University of Southampton on a project looking at gender differences in school aged children's responses to information technology. The project was funded by the Nuffield foundation and was jointly directed by Professor Paul Light (now at the University of Bournemouth), Dr Karen Littleton (Open University) and Dr Annerieke Oosterwegel (University of Southampton). The project employed a multi-method approach to explore gender differences in children's responses to computer technology. There were two phases of the project; a pilot study and a main study. A total of seventy three 13 and 14 year olds took part in the main study and were required to complete a questionnaire, repertory grid and a computer based task. In the final phase of the main study around two-thirds of the participants completed an in-depth interview, either individually or in groups. This thesis is based on a small set of the individual interviews. The interviews were informal and semi-structured and covered a wide range of topics relating to the participants' experiences with computers both at home and at school. The interviews also explored how the children themselves addressed the issue of gender differences in response to computers.

A discourse analysis perspective was employed to analyse the children's accounts. In contrast to traditional research which treats language as a relatively straightforward guide to underlying mental processes, discourse analysts highlight the pragmatic, dynamic and constructive features of language, and treat language use as a focus of interest in its own right. The analysis aimed to provide a detailed examination of some of the strategies available to the participants for reasoning about their experiences with information technology, and to explore how the significance and meaning of gender was negotiated in these contexts. Through such an analysis we should learn something about how the children understand their relationship to computers and how gender mediates these understandings. A brief outline of the thesis is given below.

Chapter One provides an overview of the research into gender differences in children's attitudes towards computing. **Chapter Two** introduces the theoretical foundations and principles of discourse analysis. Details of the data collection and analytic procedure are also discussed in Chapter 2. **Chapters Three to Five** present the analysis. **Chapter Three** explores the different 'metaphors of computing' that the children employed across the interviews. These include the

children's positive and negative characterisations of computers used for work and computers used for games. **Chapter Four** explores gender differences in the girls and boys characterisations of their ability and enthusiasm for computers. **Chapter Five** focuses on how the participants themselves addressed the issue of gender differences in response to computers. Finally, **Chapter Six** draws together the major findings of the analysis and suggests some possible directions for future research.

ACKNOWLEDGEMENTS

Thanks must go firstly to the three people who have contributed to the supervision of this project Paul Light, Karen Littleton and Annerieke Oosterwegel. I am greatly indebted to them not only for their help with this thesis, but also for the experience I gained when working with them as a research assistant on the Nuffield project. I would also like to take this opportunity to thank the two other members of the Nuffield project team, Helen Ashman and Tony Roberts, for their help with my work as a research assistant.

I am also greatly indebted to the children who took part in this project and to the headmasters and teachers who allowed me to conduct the research.

Thanks are also due to my friends Darren, Camilla, Rachel and Philip whose wit and wisdom kept me going through the last few weeks of this project. Most importantly though, I would like to thank Sandra and Michael Artis, without their generosity I would not have been able to complete this thesis.

Chapter One: Introduction to Research into Gender Differences in Response to IT

1.1. Introduction

There has been a growing interest over the last two decades in the role of computer technology in education. Computers are now seen as capable of providing new opportunities for learning (e.g.: Crook, 1994), and competence with computers is increasingly regarded as necessary preparation for future employment (Brownwell, 1993). However, debates about the potential of computers to provide new educational opportunities have been accompanied by concerns about equality of access to computer technology. One important area of concern, and the topic of this research, is gender differences in response to IT.

There is large body of research which suggests that girls may be disadvantaged in terms of their access to, and participation in, computing activities (Littleton, 1994). One important area of inquiry for those interested in understanding these differences has been gender differences in attitudes towards computers. To date, this research has mainly employed a questionnaire based approach. This chapter will argue that while this approach is valuable, it has yet to provide a coherent understanding of the why males and females differ in their behaviour towards computers (Kay, 1992a). In doing so, a case will be made for the need for more qualitative studies of children's responses to information technology. The Chapter is organised as follows: Section 1.2 will give a brief overview of the research findings relating to gender differences in participation in computing activities, and Section 1.3. will discuss some of the factors thought to influence these differences. Section 1.4. will outline the findings of the questionnaire based research on gender differences in attitudes towards computers. Section 1.5. will discuss some of the limitations of this approach and outline the need for more qualitative studies of gender differences in children's responses to computers. Finally, Section 1.6. presents a brief summary of the issues raised in this chapter.

1.2. Gender differences in participation in computing activities

Most research suggests that males and females differ markedly in their participation in computing activities. From primary school onwards girls participate less in computing activities than boys with the disparity increasing with age (Beynon, 1993; Straker, 1986). This is reflected in the large gender difference in the number

of secondary school students being entered for computer studies and computer science examinations (Buckley & Smith, 1991; Culley, 1988; Littleton, 1994). Since the late 1970s women have formed a very small minority of undergraduates on computing science courses. Unfortunately, the situation has not improved with time: The number of female applicants to study computer science at university dropped by 50% between 1977 and 1987 (Lovegrove & Hall, 1990).[1] Finally, despite a number of initiatives to attract women into the industry, the proportion of females in computing jobs (other than data processing or word processing) remains extremely low – only one in five computer programmers and computer analysts are women (*Observer*, 25 March 1990).

Research concerned with gender differences in children's participation in educational computing activities, such as that discussed above, has tended to focus on computer -related courses such as Information Technology or computer studies options. However, computers are now used in other subject domains and it seems likely that gender differences in the use of computers may vary across different curriculum contexts. Unfortunately, to date, there is little or no research that has explored the effect of curriculum context on gender differences in participation in computing and this is likely to be an important area for future research. The aspect of the present study concerned with the use of computers in school was also limited to the context of the IT lesson. It is perhaps worth emphasising then, that unless otherwise stated, references to research concerned with 'the use of computers in school' refers to IT subject courses.

Researchers have also looked at gender differences in children's use of computers outside of formal education. Boys are much more likely than girls to have a computer at home – even those girls taking computing studies examinations are less likely than boys to have a home computer (Hoyles, 1988). In those households with a computer, mothers and girls are far less frequent users than fathers and boys (Culley, 1993). Boys are also far more likely to use computers for extra-curricular activities and to participate in computing clubs (Culley, 1993). Similarly, in the USA, boys are far more likely than girls to go to summer computer camps (Hess & Miura, 1985; Kay, 1992a).

---

[1] Unfortunately, more recent figures were not available at the date of submission.

1.3. Factors influencing gender differences in participation

Despite large differences in participation in computing activities there is very little evidence to suggest that girls perform less well than boys on computing tasks (although some research indicates that males and females may use different, but equally effective, programming strategies (Turckle, 1984)). A basic assumption in research then, is that gender differences in response to computers are not inevitable, but are a consequence of the social construction of computer technology as a male domain. Researchers trying to explain the processes by which girls and women are 'edged out' of computing have highlighted several important factors. One such factor is the way computing is portrayed in wider society. In a study of the imagery employed to promote computers Ware and Stuck (1985) found that men were depicted as experts and managers whereas women were portrayed in more supportive and decorative roles. Similarly, computer games aimed at the home market are targeted primarily at boys (Kiesler, Sproull and Eccles, 1985). The themes of most games are related to male sports, various forms of destruction, land battles, space wars and physical adventures – boys are far more frequent and enthusiastic users of these games than girls (Griffiths, 1996). Several authors have highlighted the fact that the disparity in home computer use is likely to be an important contributing factor to gender differences in school. As Beynon (1993) notes boys are much more likely to enter schooling practically experienced with and enthusiastic about computers.

Other factors thought to be responsible for gender differences in response to computers relate to the structural organisation of computing in schools. In an extensive study of eight secondary schools Culley (1993) identified several factors which may contribute to girls alienation from computers. One was the link in many schools between computing and mathematics. In the schools Culley studied, responsibility for the teaching of computing was frequently allocated to the maths (thirty seven per cent) or science (eight per cent) departments. Even in schools with separate computer studies departments the staff in these departments were frequently also engaged in teaching maths. Culley (1993) argues that these factors meant that maths and computing were linked in the eyes of the pupils and that this may have discouraged girls (who are less enthusiastic about maths than boys) from participating more in computing activities.

Although, Culley's observation about the link between computing and mathematics may well be partly responsible for girls lack of participation in computing, it must also be noted that the more recent trend to employ computers across the curriculum

may have gone some way to lessening this association. Unfortunately, as has been previously stated, there seems to be little or no research looking at gender differences in the use of computers in non-IT subjects.

Another possible factor thought to contribute to girls' lack of involvement in computing is the absence of female role models. In Culley's study nearly all the computer science teachers were male, and over seventy percent of those teachers who used computers in other areas of the curriculum were male. Teachers' attitudes are also thought to be a factor. While research indicates that some teachers recognise that gender differences in response to computers may be socially produced, others consider these differences to be the inevitable consequence of girls and boys differing tastes and abilities and as beyond the influence of any school initiatives to circumvent these differences(Culley, 1993). Furthermore, when girls do perform well on computing activities their abilities are often attributed to hard work rather than ability or flair (Culley, 1993).

Finally, Culley's observations of classroom activity suggest that boys tend to dominate in terms of securing more of the teachers attention and by acquiring the newest and best computers (Culley, 1993). There is also some evidence to suggest that girls and boys prefer different modes of working and different learning styles when using computers, and that the strategies of boys may be more highly valued in the curriculum (Hattie and Fitzgerald, 1988; Hoyles, 1988).

1.4. Gender differences in attitudes towards computers

The factors outlined in the previous section are likely to contribute in complex and subtle ways to girls' relatively low participation in computing activities. For researchers interested in the processes underlying gender differences in response to computers one obvious focus (and the concern of this study) has been children's attitudes towards computing. There is a large amount of published research investigating gender differences in attitudes towards computers, the vast majority of which has employed a survey methodology. The findings of this research are somewhat contradictory (an issue that will be discussed in more detail in the next section). A brief overview of the most frequently cited findings is given below.

Most research into gender differences in attitudes towards computers has found that males are more positive than females (Chen, 1986; Eastman & Krendl, 1987; Martin, 1991; Sutton, 1991; Todman & Dick 1993). For example, in a survey of 1600 four to sixteen year olds, Wilder, Mackie, and Cooper (1985) found that more

boys than girls liked the computer at all ages. Gender differences in attitudes seem to increase with age, with greater differences among secondary school and university students than among primary and junior school students (Kay, 1992a, Whitley, 1997). As Whitley (1996) notes, an important point to bear in mind is that while boys and men frequently score higher than girls and women on attitude scales, the average scores for both groups tend fall well above the midpoint for the scales. Thus, girls and women do not have *negative* attitudes towards computers; rather, they have *less positive* attitudes than boys and men. It is also worth noting that although statistically significant differences between males' and females' attitudes are frequently observed, the differences in the means scores are usually small (Whitely, 1997; Rosen & Maguire, 1990). A final point to consider is the possibility that girls' responses may be more polarised than those of boys. In a survey of pupils' attitudes to computers in thirty-two Australian schools, Hattie and Fitzgerald (1988) found that while an equal number of girls and boys enjoyed using computers, many more boys than girls strongly disliked them.

Researchers have also looked at children's beliefs about males and females abilities and interests in computing. Several studies have reported a pattern of responses among girls which has become known as the 'We can, I can't' phenomenon. This is the finding that while girls report that women in general are just as able with computers as men, they are less confident about their own individual ability (e.g.: Makrakis, 1993). Other research indicates that children of both sexes see computing as a male activity. For example, Wilder, Mackie and Cooper (1985) found that both boys and girls perceived the use of a computer as an activity which was more appropriate for boys than girls. Similarly, Hughes, Brackenridge and Macleod, (1987) found that both sexes rated boys' liking and use of computers as higher than that of girls. Other research suggests that these gender based stereotypes may be more strongly held by boys than by girls (Whitley, 1997). Finally, girls are less likely to see any personal relevance of computers to their own lives, present or future (Makrakis, 1993), and boys are far more likely to have career aspirations in computing fields (Culley, 1993; Hattie & Fitzgerald, 1988).

1.5. Limitations of questionnaire based approaches to gender differences in response to computers

Research looking at gender differences in children's perceptions of and attitudes towards computers has to date used a mainly quantitative, construct approach. The problems inherent to questionnaire based approaches have been discussed in detail by several authors (e.g.: Potter & Wetherell, 1987). In the context of this research

one important problem relates to the fact that computers are treated as a single unitary category. Thus respondents are required to rate around thirty statements of the form; *Computers make me very nervous*. However, given that children now use computers for a wide range of tasks in a variety of contexts it is unlikely that they see 'Computers' or 'IT' as simple, singular categories. Rather it seems children's attitudes and behaviour with computers will vary in response to different computer applications, and across different contexts of computer use.

Some preliminary evidence from an as yet unpublished research project indicates that children's beliefs about whether girls and boys like and use computers are related to the particular task in question. In a study with a group of 13-14 year olds Littleton, Oosterwegel, Roberts and Light (1998) asked children to rate how much they thought boys and girls enjoyed and used computers for five different activities; games, word-processing, databases, homework and drawing. Both sexes rated boys' enjoyment of computer games as higher than that of girls, and girls' enjoyment of word-processing as higher than that of boys. In the case of databases, homework and drawing boys rated girls and boys enjoyment as roughly equal, whereas girls rated girls' enjoyment of these three activities as higher than that of boys. Exactly the same pattern of results was found in the children's rating of how much boys and girls 'used' computers for the five activities. While these results need further investigation, they suggest that children's beliefs about gender differences in computing are differentiated in terms of the task in question. It seems likely that any gender differences in children's rating of their own enthusiasm for computers may also vary across different contexts of computer use. Questionnaire based measures which compare girls' and boys' mean scores on a series of items about 'computers' may obscure these important context effects.

A final point to highlight about this study is that girls rated girls' use and enjoyment of computers as higher than that of boys *for all activities other than games*. This is highly significant when set alongside the long standing assumption that girls may feel alienated from computers and see computing as an activity that is more appropriate for boys. While we would have to be cautious about drawing any conclusions on the basis of this preliminary study, these findings do suggest that gender mediates children's responses to computers in more subtle and complex ways than generic attitude measures are typically able to assess.

Evidence from research looking at children's performance on computer based tasks also indicates that children's responses to computers may be highly context dependent. In a study comparing children's performance on a computer based

problem solving task Littleton, Light, Joiner, Messer & Barnes (1994) found that variations in the scenario in which the task was couched strongly influenced gender differences in response. When the characters in the task were 'pirates' boys performed better than girls, however when the characters were 'honeybears' there were no such gender differences in response. Similarly, in a study which varied how a computer task was introduced (without any variation in the task content) girls and boys performed equally well when the task was presented as a 'skills test' but the performance of girls fell below that of boys when the task was presented as a 'game' (Littleton, Ashman, Light, Artis, Roberts & Oosterwegel, 1999). These results indicate that children's (particularly girls') responses to computers are strongly related to both the type of task, and the context within which the task is encountered. As researchers interested in the way gender mediates children's responses to computer technology we need to be sensitive to the context specificity of those responses.

As previously mentioned, a further problem with questionnaire based research in the field of gender and IT relates to the contradictory and fragmented nature of the research findings. As indicated above, on the whole this research seems to suggest that boys are more positive in their attitudes than girls, but the findings are by no means unanimous. Several studies have found no gender differences in attitudes towards computers (see Kay (1992a; 1992b) and Whitley (1997) for reviews of the literature). In a review of the American literature Kay (1992b) found that boys showed more positive attitudes in only 46 out of 98 instances, in the remainder girls were either more positive than boys (14 cases) or there were no significant gender differences (36 cases). Part of the reason for these contradictory findings is the multitude of techniques employed to define attitudes towards computers. In his review, Kay identified at least 14 different strategies including acceptance, affect, cognitions, comfort, motivation, confidence, liking and locus of control (Kay, 1992b). Kay criticises this research on the grounds that the theoretical and statistical validity of the particular construct employed is rarely addressed – a criticism which applies equally to much of the construct based research on gender differences in aptitude and use of computers (Kay, 1992a). This lack of theoretical coherence makes it difficult to integrate the results of the large amount of published studies in this field and to draw any conclusions about the nature of gender differences in response to IT. As Kay argues:

" [...] the prevalent research methodology has made it difficult to develop comprehensive, coherent theories. I am unaware of any published research that has developed a theoretical model or comprehensive explanation of gender

differences in computer behaviour on the basis of survey research. As is the case with a jigsaw puzzle it is very hard to tell how any one piece (or study) contributes to the puzzle; therefore any picture (or theory) usually materialises at a snail's pace." (Kay 1992, p.161).

Survey research then suggests that there are small but persistent gender differences in girls and boys attitudes towards computers, however it goes little way to helping us understand these differences. As Kay argues, research using a more in-depth qualitative design is required if we are to move from identifying gender differences to understanding them.

Working in a different theoretical perspective Volman, Van Eck & Ten Dam (1995) also caution against an over dependence on the quantitative approach. In a review of Dutch research they take a critical approach to the way policy makers, teachers and researchers have conceptualised the 'problem' of girls in subjects such as science, mathematics and technology (although not specifically addressed in the article the argument applies equally well to research on gender differences in computer education). Volman et al argue that the disappointing results of research into gender differences in children's choices of science and technical subjects is partly due to the types of questions asked and the methodologies employed. They point out that the predominant research approach, which has focused on statistical correlations between school factors (e.g.: gender of teacher) and student outcomes (e.g.: choices and achievement), glosses over subtle and important processes which mediate between these factors. For example, the assumption that subjects such as maths and physics are inappropriate for girls is likely to be implicitly conveyed in many, if not all, schools. The authors argue that we need to consider the ways in which gender is defined in educational practice and how this relates to children's developing sense of themselves in relation to school subjects. It is only through a critical reflection of these issues that we will gain a deeper understanding of the way gender inequalities in subjects such as science and technology are produced and perpetuated in schools.

Elkjaer (1992) has also criticised some of the implicit assumptions in research on gender differences in response to IT. In particular Elkjaer has questioned the notion that boys' and men's relationship to computer technology represents an unproblematic goal which girls and women should emulate. On the basis of a qualitative study employing both interview and observational techniques Elkjaer concluded that boys' relationship to IT may be regarded as that of 'hosts' and girls as that of 'guests'. While this reflects the fact that boys tend to dominate the public

sphere of the IT classroom it does not necessarily mean that they are more successful in terms of their ability and confidence with the subject. Elkjaer argues that the subject content of computer science is dominated by concepts such as information, representation and problem solving and that these concepts are symbolically connected to masculinity. Because boys gender identity is linked to the subject content they have to secure their position publicly in the IT classroom and so tend to dominate the classroom discussion and recourses. However, the fact that their identity formation is linked to their success or failure in the subject can be a source of anxiety for the boys, and this is reflected by the fact that boys who struggle with the subject content are unlikely to ask for help. Girls on the other hand in their capacity as 'guests' recognise that the public arena of the IT classroom is the domain of boys, and are therefore less likely to influence the agenda of classroom discussion. However, girls do not feel inferior about their *ability* with the subject and this is reflected in their achievements. Elkjaer argues that because their gender identity is not expressed in the subject content girls have a greater 'freedom of action' and are able to develop their skills without anxiety:

"[...] *a subject content identified with symbolic masculinity provides a certain latitude for girls in relation to their specific formation of identity. Conversely, such a subject content restricts the development of boys.*" (Elkjaer, 1992, p.38).

Whether one agrees with Elkjaer or not, her study does raise some important issues frequently ignored by researchers in the field. One important point is her emphasis on the relational nature of gender: Any understanding of girls' and women's relationship to IT will require a consideration of boys' and men's interactions with the subject. A second important point relates to the questionable assumption that boys and men have an entirely unproblematic relationship to IT. It is significant that researchers have paid little attention to boys who find it difficult to succeed in computer science. Similarly, it is striking that the achievements of girls and women in the subject are rarely the focus of research (Elkjaer, 1992).

1.6. Summary of Chapter One

To summarise, on average girls participate less in computing activities than boys. Factors thought to influence these differences range from the image of computing in wider society to structural factors in the way computing is organised in schools. One important focus of research has been children's attitudes and perceptions of computers. However, research in this area has thus far been disappointing. Although overall this research indicates that girls are less positive towards

computers than boys it tells us little about the processes underlying these differences. Furthermore, the finding that girls may be less positive to 'computers' may in itself be meaningless because of the many different uses to which computers are now put. There is a need then for more in-depth qualitative studies of how children see themselves in relation to computers and how gender mediates these perceptions.

It is important to point out that the suggestion is not that researchers should abandon the construct based approach entirely in favour of a more qualitative, social constructionist perspective. Rather, there seems to be a consensus emerging among researchers in the field that a more qualitative approach is required if we are to unravel the results of the many published construct based studies. As Kay (1992b) argues, despite the theoretical tensions that such a position raises, research in the field is most likely to benefit from a co-operative relationship between qualitative and quantitative perspectives.

This study was based on a small set of individual in-depth interviews in which 13-14 year olds were asked about their experiences with computers at school and at home. A discourse analysis perspective was employed to analyse the children's accounts. The theoretical foundations and principles of this approach are outlined in chapter two.

Chapter Two: Discourse Analysis and Collection of Data

2.1. Theoretical foundations and principles of discourse analysis

2.1.1. Introduction

Discourse analysis is a term employed to refer to a variety of different perspectives across a number of disciplines. Here the term is used to refer to an approach developed by Potter and Wetherell (1987) in their book *Discourse and Social Psychology*. In this book Potter and Wetherell set out a series of arguments for the 'turn to language' in social psychology. The traditional view in psychology has been to treat language as a relatively transparent guide to underlying mental processes. By drawing attention to the essentially dynamic and pragmatic features of language Potter and Wetherell demonstrate how some of the most fundamental theoretical notions in social psychology, such as attitudes and attributions, can be illuminated by an analysis of discourse. Rather than treat language as a guide to underlying mental processes the analysis of discourse takes language use as a topic of interest in its own right and seeks to gain 'a better understanding of social life and social interaction from the study of social texts' (Potter and Wetherell, 1987).

This Chapter is divided into two major sections. Section 2.1 provides an overview of the theoretical foundations and principles of discourse analysis and Section 2.2 provides details of the data collection and analytic procedure. Section 2.1 is divided into the following subsections: Sections 2.1.2 will discuss the theoretical foundations of discourse analysis in linguistic philosophy and ethnomethodology. Sections 2.1.3 will discuss how discourse analysis has built on the insights of these perspectives to develop an empirical approach to the study of language use. There is one other approach within social psychology, developed principally by Ian Parker (1992), which is also know as discourse analysis. Details of this approach and how it differs from the perspective adopted in this study will be briefly discussed in Section 2.1.4. Sections 2.1.5. will present a brief summary of the issues discussed in Sections 2.1.

2.1.2. Theoretical foundations of discourse analysis

Discourse analysis builds on the insights of a range of philosophical and sociological writings which have revealed the essentially dynamic and pragmatic properties of language use. This Section gives a brief overview of two strands of work which have been an important influence on developments in discourse analysis; Austin's speech act theory and ethnomethodology.[2] The discussion which follows is based mainly on a précis of Potter and Wetherell's introduction to these two approaches (Potter and Wetherell, 1987, pp.14-23).

Austin's speech act theory

One important influence on discourse analysis is the work of philosopher John Austin (1962). Austin arguments were directed at a wide variety of perspectives within philosophy which viewed language as an abstract system whose central function is the description of a state of affairs. In particular Austin criticised the logical positivist view that statements which cannot be verified, that is sentences which cannot be said to be either true or false, are meaningless. In this view the statement 'God does not exist' is said to be nonsensical because its truth or falsity cannot be verified. Austin questioned the view that an understanding of 'truth conditions' is fundamental to an understanding of language. He drew attention to a set of statements which are important not for what they describe but for what they *do*. For instance the statement 'I declare war on the Philippines' is not a description of the world which is true or false but, when uttered in the right context, an act with particular consequences.

Austin called statements of this kind *performatives*. He further argued that in order for the performative features of language to be successfully accomplished certain *felicity* conditions had to be met. Thus the statement 'I pronounce you man and wife' will only be successfully achieved if the correct people are present and the correct social, legal or religious conventions are met (Potter and Wetherell, 1987).

In his early work Austin drew a distinction between performatives and *constatives*; statements whose primary role appeared to be descriptive and the truth or falsity of which could be checked; for example 'The car is in the garage'. However, Austin later abandoned the distinction between these two classes of statements arguing

---

[2] Although not discussed here, discourse analysis also draws on insights from the Sociology of Scientific Knowledge (Gilbert and Mulkay, 1984), Semiology (for an introduction see Potter and Wetherell, 1987, pp. 24-28), and conversation analysis (for an introduction see Wooffitt, 1990).

instead that all utterances have both performative and constatives features. The statement 'I bet you five pounds Rusty Brown wins the world title fight tonight' performs the act of betting, it is not just describing the bet but doing it. However, this statement also depends on issues of truth and falsity; it is problematic if 'Rusty Brown' does not really exist and there is not a world title fight on the evening in question. Performative statements then are not independent of matters of truth and falsity. Similarly, statements which appear to be merely descriptive may also perform specific actions. The statement 'Its raining outside' may describe the weather, indicate that the speaker does not want to go to the pub, or be an excuse not to do the gardening.

In light of these and a number of other concerns Austin replaced the performative/constative distinction with the *General theory of speech acts*. This theory was based on the principle that all utterances both state things *and* do things. That is, all utterances have a meaning and force. Austin suggested that in any utterance the speaker does three things. Firstly, the speaker is uttering a statement with a specific meaning - it has a certain sense and may refer to specific events, persons, and objects. Second the speaker will utter the statement with a specific force. Thus the statement 'Do the washing up' may be uttered with the force of an order, or a request. The third feature refers to the effects or consequences of the first two. Saying 'Shut the door' may result in the listener closing the door, but it may just simply annoy them.

Austin's work represents a radical departure from the view that language should be primarily understood as a rule governed abstract system. His emphasis on the performative aspects of language highlighted the importance of viewing language as a *human practice.* Similarly, by drawing attention to the role played by social conventions in proper the achievement of speech acts, Austin emphasised the importance of the social context surrounding language use.

While these positive aspects of the theory make it attractive to psychologists who are interested in the social significance of language function, the theory is not without its problems. Austin's work was primarily aimed at undermining alternative philosophical perspectives on language. As such he employed hypothetical sentences or highly ritualised speech acts rather than genuine instances of language use. Attempts to apply speech act theory to natural everyday talk have encountered a number of problems. If we try to categorise a piece of transcript into discrete speech acts for example these problems become acute; a single utterance can perform a number of acts at once, or acts may be spread over a number of

utterances. Also, in practice the decision about what act an utterance is performing is often made by referring to the response rather than any features of the utterance itself.

Ethnomethodology

A second important influence on discourse analysis has been ethnomethodology; a sub-discipline of sociology inspired by the work of Harold Garfinkel (1967). Ethnomethodology is concerned with the methods ordinary people employ to make sense of their everyday life. People are viewed as constantly attempting to understand what is going on in any given situation, and as using these understandings to produce appropriate behaviour of their own. As a discipline, ethnomethodology is concerned with many aspects of social life. Its relevance for discourse analysis lies in the insights it provides about the way language is used in everyday social interaction. In particular ethnomethodologists have drawn attention to two features of everyday talk which have important consequences for the social study of language; namely *reflexivity* and *indexicality*.

Reflexivity

Potter and Wetherell (1987) illustrate the ethnomethodological perspective on language use through a discussion of Wieder's (1974) study of life in a 'half-way' hostel for ex-convicts. Wieder's study involved an intensive period of participant observation in which he befriended both staff and inmates. In his analysis Wieder drew a contrast between the traditional sociological approach to language, where language is treated as a source of 'hidden' realities, and the ethnomethodological approach where talk is treated as a topic for study in its own right .

A recurring theme in traditional sociological research is that prisons, hospitals and other institutions have a set of informal rules which are different from and oppose the formal ones (Goffman, 1961). In this kind of work the rules are seen as guiding the behaviour of the members of the institution, and the researchers aim is to describe the rules. These rules can be uncovered by observing the conversations and behaviour of the people concerned. In this view then, language is seen as a medium through which the researcher can uncover the informal rules of the institution.

In the course of his study Wieder found that friendly conversations with inmates would sometimes be abruptly brought to an end by the statement 'You know I

won't snitch'. Weider pointed out that under a traditional framework this utterance could be seen as an exemplar of the rule 'Above all, don't snitch', and that such a rule *could* explain several features of the inmates behaviour. For example, refusing to inform the staff about deviant goings on, and helping to cover up for those who broke the official rules. However, Wieder argued that rather than seeing this statement as a mere instance of rule following, attention should be paid to what the utterance is doing, and what is achieved, in the particular context.

One effect of this piece of talk was to formulate and constrain the interaction in several ways. Thus, the utterance defined the previous part of the conversation as Wieder asking the inmate to snitch. It therefore characterised Wieder's question as illegitimate, and provided the inmate with a valid a reason not to respond. The inmates response also defined the interaction as a conversation between an inmate and an outsider, rather than one between two friends. In this way the comment established the roles of both speakers. The point is that the nature of the interaction is not one where the speakers passively follow the rules of the institution. Rather, these rules are actively reproduced on particular occasions. In this case Wieder and the resident are not just acting out the code of how inmates and outsiders should behave. Rather by saying 'You know I won't snitch' the inmate makes these roles relevant to the occasion in hand; other pieces of talk might have had a different effect.

These examples demonstrate the *reflexive* feature of language; they show that talk is not merely about actions, events and situations, in an important sense it also a *constitutes* those things. The utterance 'You know I won't snitch' is not just a description of a rule, it also defines the nature of the interaction and has a number of practical consequences within the situation (Potter and Wetherell, 1987).

Indexicality

Ethnomethodologists have also drawn attention to the indexical property of language. This idea, derived from philosophy (Bar-Hillel, 1954), concerns how meaning is defined and the importance of context If one person says 'My stomach hurts' and then someone else utters the same sentence, although the sentence is the same the reference is different. Different stomachs are indexed by the same sentence. Similarly the statement 'Its ten o'clock' could be a surprised recognition of the time, or a reminder that its time to leave for a film. In general indexical expression are expressions whose meaning alters with their context of use (Barnes and Law, 1976). Ethnomethodologists argue that for virtually any utterance

meaning can only be understood by looking at features of their context in which it is used.

Through their emphasis on the functional aspects of language use and the importance of context, both speech act theory and ethnomethodology have had an important influence on discourse analysis. The discussion will now turn to how these insights have been employed by discourse analysts to develop a psychological approach to language function.

2.1.3. The principles of discourse analysis

Psychologists often treat the linguistic reports provided by their participants as transparent representations of inner mental states and processes, such as attitudes or attributions (Widdicombe, 1995). Drawing on the perspectives outlined in the previous section, discourse analysts have criticised the view that language can be seen as a relatively neutral guide to underlying mental processes. In doing so they point to several features of language which call this view into question. This Section will discuss the main principles of discourse analysis, and will reinforce the points made above about the essentially dynamic character of language use.

The action orientation of language

As discussed earlier, in speech act theory Austin argued that all utterances both state things and do things. In line with this one of the main principles of discourse analysis is that language has an *action orientation*. Rather than simply describe psychological states or events in the real world, people use their language to *do* things; such as justify, persuade, accuse and request (Potter and Wetherell, 1987). Even accounts which appear to be mere descriptions can perform important interactional work. In fact, as discourse analysts point out, 'objective' descriptions are often drawn upon precisely because there is a sensitive or controversial issue at stake (Edwards and Potter, 1992). By offering a 'report' of events rather than making a direct accusation speakers are able to ward off the inference that their account is motivated by a vested interest and position themselves as 'just telling it how it is' (Edwards and Potter, 1992). One of the primary aims of discourse analysis is to reveal the social actions people perform in their talk and writing. However, the analyses of function is not simply a matter of categorising speech acts. The functions of talk can only be understood through close attention to the surrounding context. To take a simple example, the statement 'It's pouring' may in

one context function as a request for a lift home, in another as an excuse for not going to the pub.

Variation in accounts

Another implication of the widely held 'realistic' model of language is that when people are describing the same event, action or belief their accounts will, broadly speaking, be consistent. Discourse analysts have pointed out that when we actually look at peoples talk this notion of consistency becomes problematic. Rather we find that their is a high degree of variability in accounts. This variability stems from the functional nature of talk; because talk is oriented to many different functions, a person's account will vary according to its function.

The functional and variable nature of accounts is best illustrated with the aid of examples. The following two extracts are taken from an undergraduate study conducted by the author (Artis, 1994). This study was concerned with social class identity and sought to explore the meaning that the respondents attributed to social class in their everyday lives. The focus of the analysis was on how the meaning of social class was negotiated in everyday talk. The two extracts presented below are taken from an interview with the same respondent.

Extract.1. Thomas

I : and what defines a person's social class do you think ?
R : eh (.) I think their occupation, their financial state its very closely linked I think em and as I say also their attitudes I think they are the three most kind of important determinants eh yeah so I think really financial status occupational status and eh general sort of political beliefs attitudes I think they are the three most sort of important parts in determining class

Extract.2. Thomas

I : Do you think you will always define yourself as working class ?
R : as I said I think that there's a number a things that sort of define which class you in em and definitely by the time I work I'll be classed as being eh you know how they talk about a, b, c, d, e's and stuff eh and I do I do sort of identify with that a little bit and and sort a you know as I was saying before

my dad being a sort of a manual worker he was very
obviously working class and I- I won't be there
but
that sort of it will conflict I hope always with em
with my attitudes which I will see always as being
hopefully be working class so and I think that's
stronger that's a stronger influence on on which class
you belong to than than the job you have or the
house you live in so hopefully yeah I do I don't see
my attitudes changing and I think they are sort of
traditionally working class attitudes and eh so yeah I
hope so

In both of these extracts the respondent discusses the criteria that define a person's social class. However, there is a contrast between the two accounts. In the first extract (lines 3-6) the respondent states that occupation, financial status and attitudes are all important in defining a person's social class. In the remainder of the extract the respondent reiterates these criteria and adds 'political beliefs' (lines 7-10). In the second extract however the respondent undermines the significance of occupation in comparison to attitudes :

'*my attitudes which I will see always as being hopefully be working class so and I think that's stronger that's a stronger influence on on which class you belong to than than the job you have or the house you live in' (lines 14 -18)*

This kind of variability is commonplace in everyday language and has been documented in a wide variety of discourse (see for example, Marshall and Wetherell, 1989). For the researcher who wishes to treat language as a pathway to underlying beliefs or attitudes variability of this kind poses considerable problems. By contrast, discourse analysts fully expect people's accounts of the same events or belief to vary depending on the purpose of the talk; 'different repertoires are useful in different contexts for achieving different goals' (Potter and Wetherell, 1987). Language, then, is not treated as a pathway to entities or phenomena lying beyond the text. Rather the focus is on the discourse itself: how it is organised and what is it doing. If we take a more detailed look at the extracts above we can illustrate how such an analysis might begin.

In extract 3 Thomas responds to the question 'What defines a persons social class?'. In his response to the question he identifies four factors altogether; occupation, financial status, attitudes and political beliefs. There is no need, within the context of the question, to distinguish between the relative importance of these

factors. In the second extract he answers a question about whether his social class could change. This question orients to the idea that a persons social class may change over their lifetime, if for example they get a better paid job. If we look in detail at Thomas's response we can see that it is organised in such a way so as to reject the notion of change.

In the first part of the extract Thomas orients to the idea that other people could define his social class through objective criteria such as occupation : 'and definitely by the time I work I'll be classed as being eh you know how they talk about a, b, c, d, e's and stuff ' (lines 4-7). While Thomas states that to a certain extent he could identify with these criteria the way in which he makes this statement undermines their significance: 'and I do *sort of* identify with that a *little bit* ' (lines 7-8). Through his statement ' my dad being a sort of manual worker he was very obviously working class and I won't be there' (lines 9-11), Thomas again draws on the idea that there are certain generally accepted criteria that define a persons social class. That is, he says that while his fathers occupation as a manual labourer would place him firmly in the working class category, Thomas's future occupation (as an occupational therapist) would not. In the first part of this extract then the respondent makes relevant the idea that if objective criteria were to be employed he may not be defined as working class. Having dealt with these objective criteria in the first part of the extract he goes on to undermine their significance in comparison to attitudes, which (as discussed above) he defines as a *'stronger influence on on which class you belong to than than the job you have or the house you live in.*' (lines 16-18).

The contradictory accounts in these two extracts then can be understood when we look at the surrounding contexts. The question of how social class is defined is related to a different issue in the two extracts. In the first extract it was simply a matter of listing the criteria for defining social class; there was no need to distinguish between the relative importance of these criteria. In the second extract however the respondent own social class that was called into question. Here a different emphasis was required.

The constructive features of accounts

The preceding discussion about the functional and variable nature of accounts leads on to the third main principle of discourse analysis; the *constructive* features of accounts. As has been pointed out, the standard assumption is that language is a neutral medium employed to describe real world events or inner mental processes.

Discourse analysts argue that language does not merely reflect or mirror objects in the world, rather it actively *constructs* a version of those things. However, speakers accounts of events and dispositions are not only produced to achieve specific characterisations, they also designed to undermine alternative versions. This highlights another important feature of discourse analysis, that is; in order to understand the nature and function of particular account, we need to consider the real and potential alternatives it may be designed to counter.

For discourse analysts then the way in which we characterise various aspects of social life cannot be easily separated from the words we use in these characterisations. Rather than being merely descriptive, in a profound sense language *constructs* social and personal life. As Potter and Wetherell argue :

The term construction is apposite for three reasons. First, it reminds us that accounts of events are built out of a variety of pre-existing linguistic resources, almost as a house is constructed form bricks beams and so on. Second, construction implies active selection: some sources are included, some omitted. Finally, the notion of constructions emphasises the potent consequential nature of accounts. (Potter and Wetherell, 1987, pp. 33-34).

The emphasis on language as a constructive tool is one of the key tenets of discourse analysis. The person producing the discourse is viewed as selecting from the range of linguistic resources available to them and using these resources to create a version of events. However, these processes are not necessarily deliberate or intentional. Rather, the constructive features of everyday talk emerge as people unselfconsciously use language to makes sense of their personal and social lives. The person may not be able to articulate the constructive process in which they are engaged but that does not mean that it does not exist. It simply highlights the extent to which the constructive use of language is a fundamental, taken-for-granted aspect of everyday interaction.

In conclusion, then, discourse analysts are concerned with action rather than cognition. They are not trying to move from linguistic materials to the underlying attitudes or cognitive processes of participants. Rather, the focus is on how discourse or accounts of these things are manufactured.

2.1.4 . Different approaches to discourse analysis

As briefly indicated at the beginning of this chapter, the discourse analysis approach adopted in this study can be distinguished from another strand of discourse analysis in social psychology, developed principally by Ian Parker (1992). This strand of discourse analysis draws much more heavily on the work of French philosophers and historians such as Foucault, Barthes, Derrida and Lyotard. There are several features of this approach which set it apart from the work discussed above. Firstly, this approach does not restrict itself to the analyses of talk and writing; rather it examines *texts*: 'delimited tissues of meaning reproduced in any form that can be given an interpretative gloss.' (Parker, 1990, p. 193). Secondly, the word 'discourse' is not used to refer to language use generally but has specific theoretical connotations derived from post structuralism. A discourse is defined as 'a system of statements that constructs an object' (Parker, 1990, p. 191) and discourses are '*carried out* or *actualized* in or by means of texts' (Marin, 1983, quoted in Parker, 1990 p.194; original emphasis). Drawing heavily on Foucault, Parker argues that language is structured to reflect power relations in society. Discourses are historically located, support institutions, and have ideological effects. There is then an overt political dimension in Parker's discourse analysis (Widdicombe, 1995). Indeed, one of the primary aims of analysis is to reveal the ways that individuals (particularly minorities) are constrained and subordinated by discourse. This conception of discourse has important implications for analytic work. Rather than look at the way people use language to perform social actions, here the concern is to identify the broader discourses which inhabit talk and texts. Parker's definition of discourses is accompanied by detailed set of procedures to aid the identifications of discourses (for details see Parker,1990; 1992).

Wetherell and Edley (1997) usefully characterise the difference between theses two perspectives in discourse analysis as that between 'Top down' and 'Bottom up' approaches. 'Top down' researchers such as Parker are primarily concerned with the way people are positioned and constrained by discourse, whereas bottom up researchers focus on the activities people perform in talk and the way they use language to construct versions of self and social world. There are several discussions in the literature about the theoretical and methodological differences between these two approaches and authors in both camps provide arguments for adopting one perspective over the other (see Parker, Potter, Wetherell, Abrams & Hogg, 1990 for a discussion of the differences between these two approaches). A more eclectic view proposed by Wetherell and Edley (1997) is to view the tension between these approaches as a reflection of an inevitable paradox; people are simultaneously the products and producers of discourse. These authors argue that a

more fruitful approach is to draw eclectically on these styles of analysis and to acknowledge the contradictions that they raise —such an approach is likely to be more convincing than accounts which attempt to dissolve or resolve these contradictions (Wetherell and Edley, 1997).

Perhaps to confuse matters further, even those researchers working in the tradition of discourse developed by Potter and Wetherell (1987) have employed different approaches in their analyses. Some studies have been concerned with the fine grain of talk and the way social actions are accomplished. This form of analysis shares many of the concerns of conversation analysis about the way social actions are embedded within conversational organisation. Widdicombe and Wooffitt (1990) for example showed how members of subcultural groups employed social comparisons to characterise themselves as authentic group members. One recurrent device for achieving authenticity was to draw distinction between 'being' a member and 'merely 'doing' or performing aspects of the subculture such as wearing the appropriate dress. Other studies have been concerned with the more global themes or theories (sometimes referred to as 'interpretative repertoires') which inform participants reasoning practices. For example, Gill (1993) provides an analysis of the broad types of accounting practices male DJ's and radio producers employed to account for the lack of female DJ's in the industry. Research focusing on the broad versions participants employ shares some of Parker's concerns outlined above. However, an important difference relates to how these themes or theories are identified and explored in analytic practice. Whereas Parker sets out to identify the discourses at work in talk by a consideration of the meaning and connotations that the texts evokes, workers in the Potter and Wetherell tradition stick much more closely to the details and organisation of the participants' accounts, and try to show how versions are manufactured in their specific contexts of use.

The approach to analysis adopted in this study aimed to illustrate the broad themes and characterisations which the participants employed. However, while the analysis took the broad themes in the data as its organising principle, the details of the accounts were also a focus of interest. Further details of the analytic procedure are given in Section 2.2.4 below

2.1.5. Summary of Section 2.1

To summarise, this study will adopt the discourse analysis perspective outlined by Potter and Wetherell (1987) and Edwards and Potter (1992). Discourse analysts have criticised the assumption in traditional research that language can be seen as a

relatively unproblematic guide to underlying mental processes and representations. Language is oriented to specific functions in specific contexts, and consequently the way people use language is highly variable and inconsistent. Discourse analysts argue that this variability problematises the notion that there are underlying mental representations of self and social world. The analytic process seeks to explicate the ways in which people use language to *construct* versions of self and social reality—and what they gain from these constructions. As such language use is taken as a focus of interest in its own right.

So what does discourse analysis have to offer the study of gender differences in IT?. As outlined in chapter one the predominant research approach to children's attitudes towards computers has employed a questionnaire based methodology. This approach has tremendous advantages in that it allows us to survey a large number of participants, and to compare different age groups, cohorts, and cultures. However, the highly structured format of the survey based approach fails to allow for important contextual distinctions on the part of interviewees. There is a need then to complement construct based studies with more in-depth qualitative approaches. The present study was based on a small set of interviews with thirteen and fourteen year olds. A discursive perspective was employed to explore the way the children reasoned about their experiences with computers both inside and outside school. The aim of the analysis was to make explicit some the rhetorical techniques and devices available to children for characterising their experiences with information technology, and to explore how the significance and meaning of gender was negotiated in these contexts. Through such an analysis we should learn something about how children position themselves in relation to computer technology and how (if at all) gender mediates these understandings.

2.2. *Data Collection and Analytic Procedure*

2.2.1. Participants

The participants in this study were recruited as part of a wider project on which I was working as a research assistant. This project, funded by the Nuffield foundation, was run jointly between the Psychology departments at the University of Southampton and the Open University. The project employed a multi-method approach to look at gender differences in response to IT. The analyses for this study is based on the transcripts of twelve individual interviews (six males and six females) which were drawn from a larger sample of twenty eight interviews collected as part of the Nuffield project. The interviews included in this study were selected on the basis that these participants responded at somewhat greater length.

The participants were all either twelve or thirteen years of age at the time of the study. Ten of the participants were drawn from one of three Secondary Schools in Southampton, and the remaining two were attending a Middle School in Milton Keynes. All four schools had comprehensive intakes.

The interviews were conducted between November 1996 and May 1997 and took place in IT lesson time (at that time IT was taught to Year 8 students as a separate subject, it is now taught across the curriculum). Eleven of the twelve participants had taken part in the wider study in which they had been required to complete a questionnaire, repertory grid and computer based task. The interviews formed the final part of the project and so at the time of their completion the participants were fairly familiar with the interviewer. The ten Southampton participants were interviewed by the author and the two Milton Keynes participants were interviewed by Helen Ashman (at that time, a research assistant working on the Nuffield project at the Open University).

2.2.2. Interview schedule and procedure

An interview schedule was drawn up with fairly open ended questions including probes (see Appendix A). The interview covered several aspects of computer use in both the school and home environments, and in wider society . Some of the questions referred to a selection of images and newspaper articles which were pasted into a scrapbook (see appendix A). It was hoped that this material would act

as a stimulus to the discussion and as a novel and interesting way of raising some of the issues.

The interviews took place away from the main classroom and were recorded using a desk microphone. The interviewees were told that the researcher was interested in finding out what they thought about computers and researcher emphasised that there were no right or wrong answers (see Appendix A for how the interview was introduced to the participants).

2.2.3. Transcription

Patti Stobbs provided help with the initial transcription of some of the Southampton interviews, although more details were added by the author. The two Milton Keynes interviews were transcribed in detail by Helen Ashman. The transcription protocol is presented at the end of this chapter.

2.2.4. Analytic procedure

Discourse analysis does not involve a standard set of analytic procedures. Rather it involves developing a sensitivity to the way language is used. However, while the 'skills' (Gill, 1996) of discourse analysis do not lend themselves easily to step by step description, they are not 'mysterious' and can be developed though practice and example (Widdicombe, 1993).

In the first stage of analysis the researcher becomes familiar with the material through a detailed reading and re-reading of the interview transcripts (it is also useful at this stage to listen to the original tapes whilst reading the transcripts). Following this process of 'immersion' (Potter and Wetherell, 1987), a set of preliminary coding categories are developed. The transcripts are then systematically examined and extracts are pulled out and filed under the relevant categories. These categories are partly determined by the research questions and partly by the themes which have emerged in the initial reading phase. In this research for example, it became clear that the participants employed a variety of characterisations of computers across different contexts of the interview. In line with this, one of the initial coding themes was labelled 'characterisations of computers' and all extracts where the participants drew explicitly or implicitly on a construction of computing were filed under this theme. It is important to be as inclusive as possible at the initial coding stag, even extracts which seem only vaguely relevant should be included in order that potentially important lines of

enquiry are not ruled out at an early stage. The process of coding extracts into themes is iterative. Often a theme which initially seems promising is later abandoned or re-organised into different themes as the analyst becomes more sensitive to the material (Potter and Wetherell, 1987).

The second stage of the analysis involves a careful reading of the Sections of transcripts coded under the preliminary themes. It is here that the skills of discourse analysis come into play. A useful starting point is to try to question many of the things we ordinarily take for granted in language use. Thus, rather than try to get a 'gist' of the overall meaning, the focus of interest shifts to the ways in which accounts are constructed and the functions they achieve (Potter and Wetherell, 1987). Here, the analyst attempts to identify patterns of consistency and variability in the material, and to form tentative hypothesis about the functions that particular constructions may perform. Identifying the patterns and functions in discourse involves careful attention to the detail of single extracts, while simultaneously attending to the broader themes under investigation. This process is time consuming and difficult, and frequently involves a lot of false starts before an interpretation of the material begins to emerge.

At different stages in the analysis extracts may be approached from a different perspective. For example, one concern of this study was to illustrate the different 'metaphors' of computing that the participants employed. In this phase of the analysis the focus was on the rhetorical strategies and techniques employed to construct these differing characterisations. Attention was also paid to the different contexts in which these characterisations arose. Another phase of the analysis was concerned with the way the participants positioned themselves in relation to computing. This phase focused primarily on the participants' accounts of their abilities and of their likes and dislikes of computers. However, this stage of the analysis also involved a second look at the extracts in the 'characterisations of computers' theme, this time with a view to exploring the implications of employing a particular construction of computers for the participants relationship to computing.

The final stage of analysis involves decisions about how to present the material. Due to the large volume of material involved this phase inevitably involves a process of selection and a great deal of interesting material had to be left out. The analyses that follows is organised to reflect as closely as possible the major themes that informed the interviews. However, the analysis is not meant to be exhaustive. Rather the intention is to provide a detailed examination of some of the strategies

children employ when reasoning about their experiences with computers. Chapter Three explores the range of characterisations of computers and computing that the children drew upon in the interviews. Chapter Four, explores how the participants characterised their ability and enthusiasm for computers and how gender mediated these understandings. Chapter Five focuses on how the participants themselves negotiated the significance and meaning of gender in the context of computer technology.

2.2.5. Assessing the validity of discourse analytic work

A final point to make before presenting the analysis relates to the validity of discourse analytic research. Potter and Wetherell (1987) and Potter (1997) provide some useful criteria for assesing the validity of discourse analytic projects. The four main criteria are outlined below.[1]

1. A set of analytic claims should give *coherence* to a body of discourse. Analysis should illustrate how the discourse fits together and how patterns in the data produce effects and functions. A complete analysis should cover both the broad patterns in the data and account for the fine-grain detail of many of the micro-sequences.

2. Drawing on conversation analysis, discourse analysts make use of *participants' orientations* as they are displayed in interaction. One of the features of a conversation is that any turn of talk is oriented to what came before and what comes next, and that orientations typically display the sense that the participant makes of the prior turn. Close attention to this turn-by-turn display of understanding provides an important check on analytic interpretations.

3. A study may be assessed, in part, by how far it is consistent with previous discourse studies. A study that builds coherently on past research is more plausible than one that is more anomalous. Similarly, as with other styles of research, the validity of the claims of a discourse study may be assessed partly by subsequent research on the same topic.

4. The most important criteria for evaluating discourse analytic research are *readers' evaluations*. One of the distinctive features of discourse research is that

[1] The following five paragraphs are paraphrased from discussions of the validity of discourse analysis in Potter and Wetherell, 1987 pp. 169-172 and Potter, 1997.

the data from which the conclusions are drawn are presented along with the analysis. The reader is therefore able to judge the extent to which they agree or disagree with the analysts' interpretation of the material. This form of validation contrasts with much grounded theory and ethnography where interpretations have to be taken on trust; it also contrasts with much traditional experimental and content analytic work where it is rare for 'raw' data to be included.

2.2.6. Transcription protocol

This transcription protocol was adapted from Edwards (1997), Potter (1996).

(1.0) Numbers in brackets are pauses timed to the nearest half second.

(.) Indicates a discernible pause that is too short to measure.

((*laughs*)), ((*stands up*)) Material in double parentheses is additional comments from the transcriber.

(I mean) There is some doubt about the accuracy of the material.

(inaud) The material is inaudible at that point.

[. . .] Some material has been omitted for the sake of brevity.

<u>yes</u> Underlining is used when a word is stressed by the speaker.

OK Capitalisation is used when a word is uttered more loudly than the surrounding talk.

Square brackets are used to indicate the beginning and end of an overlap between the speakers' utterances:

Pete [You're joking]
Carole [<u>NO</u>, <u>NO</u>] I thought you would

Tom- Tomorrow or A dash marks a noticeable and abrupt termination of a word sound.

= No discernible gap between speakers turn.

Yea::h One or more colons indicate the extension of the preceding vowel sound.

hhh Aspiration (out-breaths).

.hhh Inspiration (in-breaths).

tomorrow. A full stop marks completing intonation (not necessarily a grammatical full stop).

Peter, Sue, Charles,... Commas mark continuing intonation and are not necessarily grammatical.

? Questioning intonation, regardless of grammar.

The interviewers utterances are preceded by the letter *I* and the children's utterances are preceded by a pseudonym. Copies of the transcripts are available on request.

Chapter Three: Characterisations of Computers

3.1. Introduction

As discussed in chapter one, the questionnaire based approach to children's attitudes towards computers requires the participants to rate a series of statements of the form 'Computers make me very nervous'. However, the question of what exactly researchers and participants mean by 'Computers' when they employ and respond to these measures is typically not explored in questionnaire based research. Before addressing the issue of how the participants positioned themselves in relation to computers an important first step in this research was to explore the understandings of computers that informed the interviews. This chapter explores the different characterisations of computers and computing that the children employed across the interviews. The analysis looked separately at the characterisations of computers used for work and the characterisations of computers used for games. However, any interesting parallels or contrast between these characterisations will be drawn out in the discussion.

The main aim of this chapter is to illustrate how the different characterisations of computers and computer games were constructed in talk. The extracts presented in this chapter also raise some interesting issues regarding how the participants positioned themselves in relation to the characterisations employed in the extracts. These features of the extracts will be briefly discussed where they arise. However, the issue of how the participants positioned themselves in relation to computers is the main focus of Chapter Four and will be discussed in more depth in that chapter. The present chapter is organised as follows: Section 3.2. explores the positive and negative characterisations of computers. Section 3.3 explores the positive and negative characterisations of computer games. Section 3.4. discusses the theoretical and methodological issues relating to both the variable and context-dependent nature of the participants' responses, and to the ways in which the interview schedule influenced this process. Finally, section 3.5 presents a brief summary and discussion of the issues raised in this chapter.

3.2. Characterisations of computers for work

Positive characterisations of computers

One frequently employed positive evaluation of computers was that they were 'clever' labour saving devices. For example consider the following extract:

Extract 1. ***Fiona***

1 *I* [...] How important do you think it is for children to
2 learn about computers in school ?
3 *Fiona* I dunno I think its quite important if you think about
4 it (.) all schools have computers it's like if you wanted to type up a:
5 essay (.) like that'd be useful instead of writing it all out (.) em (.)
6 like they have the bits that like you just putting the disk in (.) they
7 come up with all this information and you don't have to look for it
8 you just have to go to the computer (.) so its quite important

In extract one Fiona responds to the question 'How important do you think it is for children to learn about computers in school?'. There are many interesting features of this extract, some of which will be returned to below. The first point to note is the way in which Fiona justifies her assertion that learning about computers in school may be 'quite important' (line 3). In order to warrant this assertion Fiona cites word processing and the ability of computers to store information. When characterising the positive aspects to computing the participants frequently referred to word processing and contrasted it with the comparative slowness of writing things out by hand. The ability of computers to store information was also frequently cited by the participants as a positive aspect to computers. By citing these two aspects of computers Fiona constructs an image of computers as useful labour saving devices.

Another interesting feature of this extract is the ambiguous phrasing that Fiona employs when referring to the ability of computers to store information: 'they have the bits that like you just putting the disk in (.) they come up with all this information and you don't have to look for it you just have to go to the computer' (lines 6-8). As we shall see, when talking about the capabilities of computers the participants phrasing was often vague or ambiguous. Despite this ambiguity these accounts are effective in 'conjuring' the image of computers as useful, and as capable of complex procedures. One way in which this construction is achieved is through the use of technical or 'technical sounding' phrases. Thus, Fiona employs 'disk' (line 6) and the phrase 'all this information' (line 7). While on the one hand these phrases contribute to a particular construction of computers, they also serve to position the speaker as informed and knowledgeable about computers.

A final interesting aspect to note in extract one is the qualified character of Fiona's response. Fiona's initial response is 'I dunno I think it's quite important if you

think about it' (line 3). This statement gives Fiona's response an 'I suppose so' character. Similarly, Fiona's final statement 'so it's *quite* important' (line 8) can be contrasted with other more enthusiastic alternatives i.e. 'it's very important'. One possible interpretation of these features is that they serve to position Fiona as someone who is not very enthusiastic about computers, but who is nonetheless capable of providing an answer to the question. Thus, while Fiona cites the positive aspects of computers and offers them as a reason for the importance of computers in school, she does not necessarily position herself as someone who is strongly enthusiastic about these properties.

This feature of Fiona's account raises the issue of the extent to which the participants responses are organised to meet the requirements of the interview. With hindsight, the question asked in extract one 'How important do you think it is for children to learn about computers in school?' is quite leading. The issue of the ways in which the interview schedule and the utterances of the interviewer informed and constrained the interaction will be addressed in the final section of this chapter. One relevant point to note here is that while occasionally the participants responses may be strongly dictated by the interview schedule, it is not the case that the interviewees are merely passively responding to the interviewers cues. For example, while Fiona's account in extract one is in part organised to meet the requirements of the question, it simultaneously attends to issues of self-presentation.

In extract two James also employs a positive characterisation of computers:

Extract 2. ***James***

I (1) So-So what sort of things do you use the school computer for ?
James Em well we can em we do it in IT for projects like at the moment we're doing lampshades and it helps us design lampshades and do different nets and things it works out the nets for us [...]
I So what sort of what other lessons do you use it in apart from IT then
James E::m sometimes we use it in design technology which we have in this room
I Yeah
James And like if we want to em have accurate designs we can draw accurate lines in the computer makes it all accurate for you

In the first part of extract two James responds to a question about what kinds of activities he used the school computer for. In response to the question James

describes an activity where he used the school computer to design lampshades. Through his description of this activity James constructs an image of computers as useful and as capable of complex procedures; 'it helps us design lampshades and do different nets and things it works out the nets for us' (lines 4-6). In the second part of the extract, in response to a question about what other lessons he uses computers in, James again draws on an image of computers as capable of sophisticated and complex procedures. Here the repeated use of the word 'accurate' helps to achieve this effect: 'and like if we want to em have accurate designs we can draw accurate lines in the computer makes it all accurate for you' (lines 12-13).

Similar features can be seen in the following extract:

Extract 3. *Julie*

I Mm how does that ((*computer work*)) compare with your other school work, better or worse?
Julie Its better cause when I work on the computer it helps my handwriting for one thing and em if you've got spelling mistakes it does it it makes a funny beep so you know you've got the spelling wrong so then you can ask the teacher so computers are quite clever
I OK Would you like to be better at working with computers
Julie Yeah yeah I'd like to learn how to em start going into documents in all that things all those posh things and going to em don't know em I don't know what you would call em like screens saying different names an all that I'd like to go in there

In the above extract, Julie also highlights the utility and value of computers through her reference to word processing (lines 3-7) and her explicit statement 'so computers are quite clever' (lines 6-7). In the second part of the extract Julie expresses her enthusiasm for learning more about computers. In common with extract one, Julie also employs vague and ambiguous language when characterising computers 'all those posh things and going to em don't know em I don't know what you would call em like screens saying different names an all that' (lines 11-13). As noted above, the participants frequently employed vague language or technical sounding terms (here 'screens', line 13) in their accounts. Perhaps the reason these accounts are effective, despite being somewhat ambiguous, is that the ideas the participants are alluding to have a very common currency. Also it may be the case that talking about computers in this way is common to both adults and children. Although I am unaware of any published research that explores this issue, it seems plausible that (as in the extracts discussed above) people 'improvise' in order to

allude to aspects of computing that they do not know the correct technical terms for.

Positive characterisations of computers also frequently arose in response to questions about the importance of computers in the workplace. An example is given in extract four below:

Extract 4. ***Sarah***

I (...) do you think it's important do you think they're important in the workplace computers?
Sarah Yeah cause they're like er it's part of their equipment and that and nowadays it's technology that it's like using equipment for the weather and most computers are used (.) for things so it's like down to (inaud) is it it's all gone on computer you're like, oh and it keeps it's memory
I OK What sort of things are they used for are they used for work?
Sarah They're used for testing things like for in a lab (.) you can test things um (1.0) you can there is they can use to work the factories (.) so one dot one hit of a button you can work a whole place and you can (.) they are used for blind people cause (inaud) they have um Braille is it Braille on their keyboards

Extract four shares many of the features of the extracts discussed above. Computers are characterised as clever, powerful and as capable of complex procedures. Here again, the use of 'technical sounding' phrases such as 'equipment' (lines 3 and 4) 'technology' (line 4) and 'it keeps it's memory' (line 7) help to achieve this effect. Sarah also alludes to the idea that computers are now ubiquitous in the workplace 'it's all gone on computer' and are capable of performing procedures that may otherwise have required considerable man-power 'one hit of a button you can work a whole place' (lines 12-13). The image of computers which Sarah draws upon in this extract is of course partly occasioned by the question. However, the spontaneous, varied and enthusiastic character of the responses to this question suggest that the metaphors of computers which the participants drew upon in this context have a great deal of currency with the participants.

Negative Characterisations of computers

One common negative characterisation of computers was that they were slow and inefficient which led to frustration :

Extract 5. ***James***

I Oh right OK () Is there anything you dislike about using the school computers

James Not really eh sometimes it gets a bit annoying because they take ages to load cause they're not very powerful and its hooked up to the network an when everybody's using it at same time it takes about five minutes just to get something loaded

I Right

James Its a bit annoying

In the above extract in response to a question about dislikes James characterises computers as slow and therefore frustrating to use: 'sometimes it gets a bit annoying because they take ages to load' (lines 3-4). James goes on to offer an explanation for this in terms of the fact that the school computers are 'not very powerful' (line 4) and are hooked up to a network.

James qualifies this negative characterisation of computers by his initial statement 'not really' (line-3) and also by his use of the phrase 'a *bit* annoying' in lines 3 and 8. This is similar to the manner in which Fiona qualified the positive characterisation she employed in extract one. The participants commonly made qualifications of this kind when talking about the negative aspect of computers. Perhaps one function of these qualifications is that they ward off the possible inference that the speaker strongly dislikes computing. Having made the qualification the speaker can go on to talk about the commonly known problems of computing without necessarily presenting him or herself as someone who is negative about IT. After all, perhaps one way of presenting oneself as informed about computing is to illustrate ones awareness of the commonly known frustrations of working with computers.

These features again highlight the extent to which the participants responses are occasioned. In extract five James's response is partly produced to meet the demands of the question 'is there anything you dislike about using the school computers'. However, James' response also reflects his experiences with computers, and is subtly organised to position James as someone who is aware of the negative aspects of working with computers but who does not necessarily dislike them.

Another frequently cited negative and frustrating aspect to computers was the fact that they could be difficult to understand. Consider the following extract:

Extract. 6 ***John***

I So what do you dislike about the school computer?
John Nothing really it's just when you don't know how to do something (.) it's like (.) if there's something you don't know how to load up like (.) Pin Point Junior what it was (.) we were using that yesterday (.) and everyone else was on there but for some reason I couldn't get there and what I don't like is when you can't get there and when you do you still don't know what to do cause it's not like explaining the stuff on the screen and then you get mucked up and an you do your work (.) an (things like that)

In the above extract John responds to the question 'So what do you dislike about the school computer'. As in the previous extract, John's initial response 'Nothing really it's just' slightly qualifies the subsequent negative characterisation. In lines 2-3 John states that one of the things he dislikes about computing is 'when you don't know how to do something...'. Rather than stop here John goes on to describe an incident when he could not load the computer programme Pin Point Junior. Through his statement 'but for some reason I couldn't get there' (lines 5-6) the problem is attributed to the computer rather than anything John could have reasonably been expected to do.

In lines 6-8 John again makes a general complaint about computers: 'and what I don't like is when you can't get there and when you do you still don't know what to do'. Here again the problem of not knowing what to do with computers is attributed to the inaccessible character of computers rather than to Johns' lack of knowledge: 'cause it's not like explaining the stuff on the screen' (lines 7-8).

A third negative characterisation of computers was that they could be unreliable:

Extract 7. ***Andy***

I yeah (.) so (.) would you say there are any other disadvantages (.) apart from lack of skills (.) to working with computers ?
Andy yeah cos you could have stored like loads and loads and loads of information and say (.) um the computer there's something wrong with the computer like a virus or something and then you could lose like years and years of study something like that
I so we can rely on them (.)
Andy we can rely on them
I too much
Andy yeah
I you think and they can (.)
Andy yeah
I let you down

15 *Andy* yeah like over like you could of (.) been working on
16 some really really important project like (.) like I dunno like a cure
17 for something (.) and then (.) all of a sudden (.) your computer's (.)
18 like blown up or something and then all your work's been gone it's
19 all vanished

In the above extract Andy draws on the idea that computers can at times be unreliable and that you can suddenly, without warning, lose important information or a piece of work. In both parts of the extract Andy employs an extreme case formulation. Thus Andy states 'you could have stored like loads and loads and loads of information' (lines 4-5) and 'you could lose years of years of study' (line 7). This extreme characterisation serves to emphasise the severity of this negative aspect to computers. Similarly, in the second part of the extract, in response to the interviewers cues, Andy re-iterates the pitfall to computing: 'you could have been working on some really really important project... and then all of a sudden your computer's like blown up...' (lines 15-18).

A further negative characterisation of computers was that they could be boring and mundane to use. An example is given in extract 8 below:

Extract 8. ***Debbie***

1 *I* (. . .) Do you think you're better at working with the
2 computer or your other schoolwork?
3 *Debbie* My other schoolwork
4 *I* Why is that?
5 *Debbie* I don't know I find computers quite boring
6 *I* So you're not interested (.) why do you think they're
7 boring?
8 *Debbie* You're doing work on the computer you see a blank
9 screen (.) you're just writing along (.) otherwise (.) if you're not on
10 that you can sit anywhere you can do your work (.) you're a lot
11 more mobile when you're not using the computer (.) you can pick it
12 up whenever

In the above extract Debbie initially responds to the question 'Do you think you're better working with the computers or at other types of school work'. In her response Debbie states 'my other school work' (line 3). When asked to account for this Debbie states that she finds computers 'quite boring' (line 5). In her response to the interviewers follow up question Debbie characterises working with computers as mundane 'You're doing work on the computer you see a blank screen (.) you're just writing along' (lines 8-9). Debbie contrasts this with other types of work where 'you can sit anywhere' (line 10) and 'you're a lot more mobile' (lines

10-11). As we shall see, the idea that working with computers or playing computer games for long periods of time could be mundane was frequently drawn on by the participants in their accounts of the negative aspects of computing.

3.3. Characterisations of computers for games

Positive characterisations of computer games

The participants descriptions of their interactions with computer games were lively and enthusiastic. Computer games were characterised as realistic and the participants described their interactions with the games as very involved and as lasting for long periods of time. Many of the features that the participants employed to characterise computer games are illustrated in extract 9:

Extract 9. ***Pete***

I Okay do you like playing the games?
Pete I LOVE playing the games it's like a way out of what's happening and you just sit there and you're actually in another world of what game you're playing
I What kind of games do you like?
Pete Well at the moment (.) I like football games but one in particular where you're actually a manager (.) and it's much more into (.) you can actually choose players (.) so I just sit there for ages and just play
I So what's that game called?
Pete Championship Manager
I Why do you like that particular game?
Pete Because I'm very interested in football and (.) it's just the way it's (.) it's real life players so you can actually do to them what you want and put them in their positions and you (.) it's so realistic that you (.) I just sit there for ages
I Why are computer games so good do you think why are they so interesting?
Pete They er (.) they take you away from what you're doing now and they actually try and get you involved which is quite important (.) and platform games or something like that (.) you don't (.) if you lose a life or something you don't say right I've lost it I'm going now (.) you say I'm going to get that back and I'm going to get across that bridge or what (.) and that's really addictive (.) sort of
I So what's a platform game?
Pete It's where it's (.) you're controlling a person and (.) it's sideways scrolling and you have to jump and shoot on platforms really

In the above extract Pete responds to a series of questions about computer game playing. The first feature to note is the enthusiastic character of the response. Thus in response to the question '...do you like playing the games?' (line 1) Pete initially states 'I Love playing the games' (line 2). Pete then offers an explanation of why he likes computer games 'it's like a way out of what's happening and you just sit there and you're actually in another world of what game you're playing' (lines 2-4). Here Pete characterises computer game playing as an activity in which the player is intensely involved, to the extent that they are unaware of things going on around them. This idea is drawn upon again later in response to the question: 'Why are computer games so good do you think ....?' (lines 17-18). An interesting aspect to draw attention to here is Pete's description of how, when playing computer games, the player will be determined to succeed 'if you lose a life or something you don't say right I've lost it I'm going now (.) you say I'm going to get that back and I'm going to get across that bridge' (lines 22-24). Pete suggests that it is this desire to succeed which draws the player back to the game 'and that's really addictive' (line 24). Descriptions of 'what people are thinking' when they play computer games were frequently employed by the participants and were very effective in constructing an image of game playing as an activity which involves intense concentration and complete absorption in the game.

A further interesting aspect of the above account is Pete's references to the 'realistic' character of computer games. Thus when describing a football game Pete states 'you're actually a manager' (line 7), 'you can actually choose players' (line 8) and 'it's real life players so you can actually do to them what you want and put them in their positions ...it's so realistic' (lines 14-16). The idea that computer games were very realistic was frequently drawn on by the participants when characterising their liking and enthusiasm for computer games. References to the realistic aspect of computer games also contribute to the overall characterisation of game playing as an activity in which the participant becomes intensely involved — it is the realistic and convincing character of computer games that draws the participant into the game.

Descriptions of long, uninterrupted periods of play also contributed to the construction of game playing as an intensely involved activity. Thus Pete states: 'I just sit there for ages and just play' (lines 8-9) and 'I just sit there for ages' (line 16). The use of the word 'just' here serves to emphasise the fact that when playing Pete's concentration is focused solely on the game. Interestingly, while in this extract Pete employs this description in a positive way to position himself as an enthusiastic and regular game player, in other contexts descriptions of people

spending long periods of time 'just' playing computer games were employed to construct a negative image of computer game enthusiasts.

A final aspect to note in this extract is the interviewer's question 'So what's a platform game?' (line 26). It is interesting to note that in contrast to the section of the interview concerned with 'computers for work' where (from the interviewer's perspective) the participants vocabulary seemed somewhat limited, when the conversation turned to computer games it was the interviewer who positioned herself as 'uninformed'.

Similar features can be seen in extract 10 below:

Extract 10. ***Julie***

I What sort of games do you like then
Julie I like fighting games and em I like Sonic the Hedgehog I don't know why em and I gotta Super Bomber Man
I A what ?
Julie Super Bomber Man
I So what sort of things what is it about those games you like then
Julie Don't know they're exciting cause when like something comes along with em Killer Instinct its a game that you have to fight and when the bad man if you're on the last bad man you have to fight him its really exciting cause you know you've got to win
I Right
Julie And with Bomber Man you've got to lay bombs everywhere and blow animals up its quite good it's it's really funny when the man blows himself up in little bombs

In the above extract Julie responds to some questions about what kinds of games she likes. In the first part of the extract Julie lists some of the games she likes to play (lines 2-3). In her response to the question '... what is it about those games you like ...' (lines 6-7) she states 'Don't know' (line 8). However, she goes on to describe the games as 'exciting' and backs up this statement by describing, how, when playing 'Killer Instinct', the player becomes caught up in the game and determined to succeed '...if you're on the last bad man you have to fight him its really exciting cause you know you've got to win...' (lines 10-11). In the final part of the extract Julie provides another example. Through her description of what you have to do to play 'Bomber Man' (lines 14-16) computer games are again characterised as fun and exciting and as something in which the player becomes very involved.

Negative characterisations of computer games

The participants characterisations of computer game playing were not always positive. In some contexts the participants oriented to the idea that playing computer games too often may be undesirable. Consider extract 11 below:

Extract 11: *Pete*

I OK would you like to be better at playing computer games?
Pete I'd like to get back up to the standard I that I was when I had my (inaud) but I don't think it's as important as work or (.) understanding computers any more
I Why is that?
Pete Well when you get older sometimes you (.) don't need them as much as you should when you are little.
I What sort of person is good at playing computer games?
Pete Someone who sits there for hours and can get addicted to any game that they start playing.

In the above extract Pete responds to the question 'would you like to be better at playing computer games' (lines 1-2). In his initial response to the question Pete states 'I'd like to get back up to the standard I that I was when I had my ' (lines 3-4). However, Pete goes on to qualify this by stating that he no longer considers computer games to be as important as work or 'understanding computers' (line 4-5). Here, Pete distances himself from the possible inference that his interest in computer games may be detrimental to his involvement in other activities. Through his statement 'any more' (line 5) Pete suggests that he had previously given a higher priority to games. Following the interviewers prompt Pete elaborates on this idea 'Well when you get older sometimes you (.) don't need them as much as you should when you are little' (lines 7-8).

There is an interesting difference of emphasis between this extract and extract 9 where Pete presented himself as a regular and strongly enthusiastic computer game player. In extract 11 Pete maintains that he is interested in computer games by stating his wish to regain some of his game playing expertise, but his account is organised to ward off the possible inference that he plays computer games too often. The participants frequently oriented to the idea that being *too* keen on computer games or playing them *too* often was undesirable. Pete orients to this idea again in response to the question 'What sort of person is good at playing

computer games?' (lines 9-10). In his response Pete draws on a negative image of someone who plays computer games for long periods of time and who can 'get addicted to any game they start playing' (lines 11-12). As previously mentioned, it is interesting to note that while in extract 9 Pete employed the phrase 'I just sit there for ages' to position himself as an enthusiastic and regular game player, in extract 10 the phrase 'someone who just sits there for hours' (line 11) is employed to construct a negative image of someone who spends an excessive amount of time playing computer games. In this way the participants accounts were subtly organised to strike a balance between presenting themselves as enthusiastic computer game players while simultaneously distancing themselves from the potential inference that they played computer games to an 'unhealthy' or excessive degree.

In the following extract Amy also draws on a negative characterisation of computer game playing:

Extract 12 ***Amy***

1	I	Would you like to be better at playing computer
2	games	
3	*Amy*	Not really (.) I'm [quite]
4	I	[Why not]
5	*Amy*	[My-] My life's quite busy as it is I got horses so I
6	don't really have much chance to do everything	
7	*I*	Right so you spend a lot of time (inaud)
8	*Amy*	Yeah
9	I	What sort of persons <u>really</u> good at playing computer
10	games	
11	*Amy*	My brother ((laugh))
12	I	Why's that ?
13	*Amy*	He hasn't got really much very much interests apart
14	from skateboarding so when he's like at home he just plays on the	
15	computer and then watches TV	

In the above extract Amy also responds to the question 'Would you like to be better at playing computer games'. In response to the question Amy states 'Not really' and explains that she is too busy doing other activities such as horse riding (lines 4-5). In response to the question 'What sort of persons really good at playing computer games' Amy cites her brother, and draws on the image of the socially isolated computer game player who has very few interests other that game playing: 'He hasn't got really much very much interests apart from skateboarding so when he's like at home he just plays on the computer and then watches TV' (lines 12-14). There is a contrast then between Amy's description of herself as someone who is

too busy to develop her game playing expertise and her characterisation of her brother who 'hasn't got really much very much interests apart from skateboarding' (lines 12-13) and who when he is not playing the computer 'watches TV' (line 13). The contrast in the account serves to construct an image of people who play computer games very frequently as having a sedentary lifestyle and as having few hobbies or interests.

3.4. Variability and context specificity of participants accounts

In the previous two sections the participants drew on diverse and contradictory characterisations of computers. In section 3.2 computers were characterised on the one hand, as fast, powerful, clever, labour saving devices which were capable of a wide range of complex procedures; and on the other, as slow, inefficient, unreliable and frustrating to use. In section 3.3. the participants characterised computer games as exciting and computer game playing as an activity in which the player becomes intensely involved; however, the participants also oriented to the idea that playing computer games too often could be mundane and undesirable. It is important to point out that all of the children employed both the negative and positive characterisations discussed above. As the following extract demonstrates these contrasting characterisations were often employed within one or two conversational turns:

Extract 13. ***Fiona***

I Right OK. (2.0) What kind of thing do you like doing on the school computer?
Fiona I like typing (laugh)
I Right
Fiona I do I like typing em
I Why do you like it
Fiona I just like it cause its like instead of writing you just type it up and .hh (.) an like its easier if you write it out you have to like cross it out and all that but on the computer you just delete it an stuff like that ((sniff))
I OK (.) so its useful then
Fiona Mm
I Is there anything else you like using it (.) for (.)
Fiona Nno
I (3.5) Is there anything you dislike about using the computers for school work
Fiona Em (2.0) loggin on its annoying some- I dunno I suppose its useful but sometimes it takes too much em takes too long cause other people are doing it as well so you gotta wait like if you're printing as well like in IT you have to wait a lot as well [sometimes you don't]

22 [bell rings]
23 [Its the bell] ((2.0) pause while bell stops ringing)
24 *I* Is that it?
25 *Fiona* Yeah sometimes em (1.5) sometimes like you have
26 to wait or sometimes it don't even print out at all
27 *I* Right=
28 Fiona =Cause I done that last week I wanted to print a piece
29 of work out but it didn't come out (.) sometimes its annoying

There are a number of interesting features of this extract. The point to draw attention to here is the contrast between the characterisation of computing in the first and second parts of the extract. In the first part of the extract the interviewer prompts Fiona to explain why she likes typing. In lines 7-10 Fiona describes the benefits of word processing, while her description is not very explicit it is effective in drawing on the idea that word processing packages make writing quicker and easier. Later in the extract, when asked if there is anything she dislikes about computers, Fiona characterises computing as an activity that can at times be 'annoying' and slow (lines 17-21). Fiona backs up this characterisation by describing a specific occasion when she had problems printing some of her work (lines 25-29). An interesting point to note is that in her description of the 'annoying' aspects of computing Fiona orients to the previous discussion about the utility of computers through her statement 'I dunno I suppose it's useful' (lines 17-18). It is also worth noting that it was the interviewer who initially employed the word 'useful' (line 11). In this way the statement 'I suppose it's useful' functioned both to acknowledge Fiona's previous comments, and the comments of the interviewer, she was then able to draw on a negative characterisation of computers without appearing to contradict herself or to disagree with the interviewer.

This extract highlights a number of important points frequently made by discourse analysts. One issue is the fact that people represent themselves and the world in varying and contradictory ways. This is due to the primarily functional nature of talk: People use talk to achieve particular interactional goals, the particular construction that they draw upon will vary according to the purpose of the talk. This kind of variability poses problems for measures which assume that children have a fixed concept or attitude towards computers. As the extracts discussed in this chapter demonstrate, children employ diverse characterisations of computers and draw on them flexibly across different conversational contexts.

A related point is the criticism made by discourse analysts of the assumption in attitude scales that we can make a conceptual distinction between the attitude

'objects' (here computers) and 'dimensions of judgement' (negative or positive evaluations). Discourse analysts argue that when we look at everyday talk objects are simultaneously constructed and evaluated, the way in which objects such as computers are defined varies according to the purpose of the talk. Rather than try to discover what people 'really think' about things such as 'computers', in discourse analysis the focus is on how accounts of these things are manufactured in their specific contexts of use (Potter and Wetherell, 1987).

A final important issue to discuss is the way in which the research tool defined and constrained the interaction. It is important to bear in mind the context within which the participants' accounts were produced. Thus the participants met with a 'researcher' who was 'interested in finding out what children their age think about computing'. The participants' responses were undoubtedly informed by their perceptions of what was required of them and what was correct or appropriate for the occasion. However, although in some instances the interview schedule functioned much like a questionnaire, with the participants' responses strongly dictated by the questions, this was not the case for the entire interview. More open questions gave the participants greater opportunity to dictate the topic of discussion. Furthermore, there were points in the interview where the participants actively resisted the implication in the question. The point here is that in contrast to other forms of analysis, the discourse analyst is reflective about, and pays keen attention to, the ways in which the research tool and the researcher are influencing the participants behaviour. At any given point in the interview the participants will be orienting to a variety of concerns; sometimes to present themselves in a favourable light, at others to express a particular view on computing, at others to provide what they think is the 'right answer'. By paying attention to the way accounts are constructed and the functions which these constructions achieve, the analyst can offer an interpretation as to the main concerns informing the interaction and how the participant orients themselves in relation to these concerns.

A final point to consider is the extent to which the researchers *gender* informed or constrained the interaction. There were no instances within the interviews where the participants (or the interviewer) oriented explicitly to the gender of the interviewer and this did not emerge as a major theme in the analysis. However, it is of course possible that in some contexts the participants accounts would have been different if the interviewer had been male (cf. page 85). It would be interesting to compare the interviews in this study with a set of similar interviews conducted by a male researcher, unfortunately such a comparison was beyond the scope of this research.

3.5. Summary of Chapter Three

This Chapter aimed to illustrate the range of 'metaphors of computing' that the participants employed across the interviews. Computers for work were characterised as fast, powerful, efficient, labour saving devices capable of complex procedures that would otherwise be time consuming or impractical. The participants also drew on the idea that computers could be slow, frustrating to work with, difficult to understand, and unreliable. On some occasions the phrasing employed by the participants in these accounts was somewhat vague or ambiguous. Despite this ambiguity however, these accounts were effective in 'conjuring' the image of computers as useful and as capable of complex procedures. One way in which this construction was achieved was through the use of technical or 'technical sounding' phrases. Besides contributing to a particular construction of computers these phrases also served to position the speaker as informed and knowledgeable about computers. Computers for games were characterised as exciting, fun and realistic, and computer game playing was characterised as an activity in which the player becomes intensely involved. The participants also drew on the idea that being too keen on computer games or playing them too often could be undesirable. In doing so, they drew on the image of the solitary computer game player who plays computer games at the expense of their involvement in other activities. Finally, the extracts discussed in this Chapter illustrate the variable and context dependent nature of the participants responses, and the extent to which the participants responses are informed and constrained by the interview schedule.

While this Chapter focused on the broad characterisations the participants employed across the interviews, Chapter Four turns to a discussion of how the participants positioned themselves in terms of their ability and enthusiasm for computers, and how gender mediated these characterisations.

Chapter Four: Gender Differences in Characterisations of Ability and Liking of Computers

4.1. Introduction

The previous Chapter was concerned with the broad characterisations of computers that the children employed across the interviews. This Chapter turns to a discussion of how the participants positioned themselves in relation to computers and how gender mediated these understandings. The analyses revealed very few differences in the girls and boys characterisations of their ability with computers. To reflect this, Section 4.2. of this Chapter explores how the children *as a group* characterised their own and others ability with computers for work; and Section 4.3 explores how the participants characterised their own and others ability with computer games. Any issues relevant to the question of gender differences are discussed where they arise. Gender differences are further explored in Section 4.4., where the girls and boys responses to a small set of questions about their ability with computers are compared. In order to address the extent to which gender mediated the participants expressed enthusiasm for computers, Section 4.5 presents a quantitative comparison of the girls and boys responses to a small set of questions concerned with liking of computers. Finally Section 4.6. presents a summary and discussion of the issues raised in this chapter.

4.2. Competence with computers for work

Being good with computers

Positioning oneself as competent with computers was frequently achieved by reference to computing skills or by describing oneself as 'knowing what to do'. For example consider the following extract:

Extract 1. ***Julie***

I OK. Would you say you were good at working with computers?
Julie Yeah I am quite good actually I can type really fast, quite fast anyway, and I can help other people when they're stuck cause they don't know what to do with their things cause funny things come on the screen saying different things so you just have to press different things and then it goes away so

In the above extract Julie responds to the question 'OK Would you say you were good at working with computers?'. In her initial response to the question Julie states 'Yeah I am quite good actually' (line 3). She warrants this statement in by citing her ability to 'type really fast' (line 3) (the qualification 'quite fast anyway' (line 4) is perhaps offered in case her initial statement was challenged). Julie further warrants her claim that she is good at computer work by describing herself as being able to help others who find computing difficult. Thus in lines 5-7 Julie draws on the idea that computers are sometimes difficult to understand. As with several of the extracts discussed in Chapter 3 Julie's characterisation of this aspect of computing is somewhat vague and ambiguous: 'cause funny things come on the screen saying different things so you just have to press different things and then it goes away so' (lines 5-7). In her account, Julie positions herself as someone who is confident with this aspect of computing and so is able to help others who find these tasks difficult. The ability to help others was frequently cited by the participants to characterise computing competence; and descriptions of oneself or others as 'needing help' were employed to characterise lack of understanding or problems with computers. When referring to some of her fellow classmates in lines 4- 5 Julie states 'they don't know what to do with their things'. As we shall see, references to oneself or others as 'knowing what to do' or 'being in control' were frequently employed to characterise competence with computers; and '*not* knowing what to do' was employed to characterise lack of ability or competence.

Another strategy for positioning oneself as competent was through references to experience with computers:

Extract 2. *James*

I (4) OK Would you say you were good at working with the computers
James Yeah fairly good cause I've got a computer at home
I Mm hm

5 *James* An I know what em what to do on the school computers
6 cause in year 7 they tea- taught us all about how to get into different
7 applications

In extract 2 James backs up his statement that he is 'fairly good' (line 3) at computing by describing his experience with computers. He draws attention to this experience by firstly stating that he has a computer at home and then by describing his experiences with computers in school. James's reference to a specific computing skill he has acquired ('how to get into different applications' (lines 6-7)) serves to position him as knowledgeable about computers. It is interesting to note that computing skills were almost always described as something which were acquired through experience (as opposed to something that one could be naturally good or bad at).

Similar features can be seen in extract 3 below:

Extract 3. ***Pete***

1 I Why do you think that you're quite good at using
2 computers?
3 Pete As I've said I've used them for quite a long time and (.)
4 I understand how they work much more and I can get (.) I can finish
5 tasks that I'm given quite fast and (.) get on to other work (.) I base it
6 on that and also my Mum is a typing teacher so she teaches me how to
7 type (.) so I'm quite fast on the keyboard

In extract 3 Pete responds to the question 'Why do you think you're quite good at using computers?'. In response to the question Pete firstly refers to his experience with computers 'I've used them for quite a long time' (line 3). Through his statement 'I understand how they work much more and I can get (.) I can finish tasks that I'm given quite fast and (.) get on to other work' (lines 4-5) Pete positions himself as both knowledgeable about computers and as confident about working with them on his own. In line 7 Pete describes himself as 'quite fast on the keyboard', his reference to the fact that his mother is a typing teacher serves to add weight to this claim.

In their responses to the question 'So what sort of person is good at working with computers?' the participants also drew on the idea that competence with computers was gained through experience and involved 'knowing what to do'. The following three extracts are taken from the participants responses to this question:

Extract 4. *Sarah*

Sarah (2.0) A person that is probably intelligent and likes computers and really brainy and (.) someone that's probably got one at home and then they're used to home computers and school computers to know what they're doing both

Extract 5. *Colin*

Colin Oh um people that have had more experience and pr- training are better than people that have only just started
I Right
Colin If you go to training like at a college or something you get your co- confidence built up in you and you know what to do and you're not afraid of pressing the wrong button

Extract. 6 *Debbie*

Debbie Any kind it doesn't really matter (.) as long as they know how to use the system

In extract 4 Sarah cites intelligence and liking of computers as possible qualities of someone who is good at computing. She also draws on the idea that such a person is likely to have had experience with computers at home. Colin, in extract 5, also cites experience as an important factor. He elaborates on this claim in lines 4-6 by stating that experience is likely to give someone confidence with computing and make them less likely to be concerned about 'pressing the wrong button' (line 6). Finally, Debbie, in extract 6, resists the implication in the question that there may be particular qualities that make someone good at computing: 'Any kind it doesn't really matter'. Through her statement 'as long as they know how to use the system' Debbie also draws on the idea that being good at computing involves 'knowing what to do'.

Being not so good with computers

One way of presenting oneself as *not so good* at computers was by describing oneself as lacking experience with computers and as needing help when working with them, for example in extract 7 below:

Extract. 7 *Sarah*

I Would you say you were good at working with computers?
Sarah No I wouldn't say I was that good working with computers

I Why not?
Sarah Cause like I haven't been on computers that much like most people have (.) and so I've only had like a small one at home but not a proper one like they got in the school (.) and so
[. . .]
I OK Would you say you were better at working with the computer or other types of school work?
Sarah Other types of school work
I Why 's that?
Sarah Cause other types I can just get on and then you haven't got problems there (.) if a problem came up with the computer (.) and the teacher's busy you have to sit there and put your hand up where if you've got other work then you just get on with it and then you know what to do
I I see would you like to be better at working with computers?
Sarah Yeah
I How good would you like to be?
Sarah I'd like to be like Anthony Stevens ((laughs))
I Yes he's very good is he?
Sarah Yeah he (.) he normally helps us when we're stuck and he knows what to do most of the time so he's like a second teacher
I Why would you like to be (inaud) ?
Sarah Cause he knows what to do and he doesn't sit there mostly with his hand up he just gets on with it (.) so if I was like him I could just get on with it and I could help others and then (.) instead of me just sitting there putting my hand up wasting my time

In the above extract Sarah states that she does not consider herself to be 'that good' when working with computers (line 3). Sarah accounts for her lack of ability in terms of the fact that she has had less experience with computers than others: 'I haven't been on computers that much like most people have' (lines 4-5). She adds, that while she has a computer at home, it is 'a small one ... not a proper one like they got in the school' (lines 5-6). Here, Sarah draws on the idea that competence with computers is gained through experience; by describing her lack of experience with computers she accounts for her initial statement that she does not consider herself to be particularly good at computing.

In the second part of the extract Sarah responds to the question 'OK Would you say you were better at working with the computer or other types of school work?' (lines 8-9). In her response Sarah states 'other types of schoolwork' (line 10). Sarah accounts for this by drawing a contrast between computer work and other types of school work.

She states that while she can 'just get on' (line 12) with other types of work 'if a problem came up with the computer (.) and the teacher's busy you have to sit there and put your hand up' (lines 13-14). Here, Sarah orients to the idea that while the teachers attention is crucially important when a problem arises in the IT lesson, this is not the case in the other subjects where 'you just get on with it and then you know what to do' (lines 15). In this section of the extract then Sarah's lack of success is attributed not to her lack of competence with computers but rather to characteristics inherent to the subject. Sarah's comments about having to wait for help when the teacher is busy also highlight the extent to which children's evaluations of computers and computing will be informed by the context within which their experiences of computers take place.

In line 20 Sarah responds to a question about how good she would like to be with computers by referring to one of her classmates 'I'd like to be like Anthony Stevens' (line 23). Sarah describes this fellow pupil as 'like a second teacher' (line 23) who is able to help others with computing problems; and who 'knows what to do most of the time' (line 26). Sarah draws a contrast between this 'expert pupil' and herself: ' he just gets on with it (.) so if I was like him I could just get on with it and I could help others and then (.) instead of me just sitting there putting my hand up wasting my time' (lines 29-31). Thus while in extract one (p. 45) Julie positioned herself as competent with computers by describing herself as able to help others, Sarah positions herself as not very good with computers by describing herself as 'needing help' and by contrasting this with the ability of another pupil who is able to offer help to others. These features again highlight the extent to which the way the children position themselves in relation to computers will be influenced by the social and institutional contexts within which their experiences of computers take place. Thus, children's perceptions of their own abilities with computers are likely to be partly informed by how they perceive these abilities in comparison to those of their fellow classmates.

The idea of the expert pupil was referred to by a few of the respondents across different contexts of the interview. Although it would be unwise to draw on any conclusions on the basis of the small number of participants in this study, it is perhaps interesting to note that none of the participants referred to a female pupil who they through was 'expert' at computing.

In the following extract Andy also describes himself as less able with computers:

Extract. 8 ***Andy***

I OK (.) um (.) I've got another question here do you find working with computers easy or difficult ?

Andy Difficult

I What kinds of things are (.) particularly difficult?

Andy Well (.) it's just (.) when you're like me and don't understand anything about computers it's all (.) it's all difficult because (.) you can't understand or anything and get (.) a bit stressed and get a bit muddled up with where I'm going and what I'm doing

In the above extract Andy states that he finds working with computers difficult (line 3). In response to the interviewers follow up question 'What kinds of things are particularly difficult?' Andy states that he does not understand 'anything about computers' (line 6) and that he gets 'a bit stressed' (line 7) and 'a bit muddled up' (lines 7-8) when working with them. Thus, while 'knowing what to do' with computers was employed by the participants to position themselves as competent with computers, here lack of understanding and the idea of 'not being in control' is employed to characterise lack of ability.

It is interesting to note how Andy's account in extract 8 makes relevant a particular construction of computers as complex and difficult to understand. The participants frequently drew on this construction when describing their difficulties or lack of understanding of computers. This feature again highlights the point made in Chapter 3, that it is difficult to separate what the children think about 'computers' from how they position themselves in relation to them. When we look at the participants talk we see that these issues are mutually inter-defined — different constructions of computers may be employed in different contexts to achieve different 'self presentational' goals; equally, different 'self presentations' may implicitly or explicitly draw upon different constructions of computers. In extract 10, John also draws on the idea that computers can be complex and difficult to understand:

Extract. 9 ***John***

I (1.5) Do you think you're good at working with computers?

John Yeah I- I know a bit about em but when it comes to like people carrying on about all these disks and stuff like that I'm no good I just know what I gotta know (...)

In the above extract John responds to the question 'Do you think you're good at working with computers' (lines 1-2). In his response John initially states 'I know a bit about em' (line 3). However, he goes on to qualify this through his statement: 'but when it comes to like people carrying on about all these disks and stuff I'm no good' (lines 3-5). Here, John draws on the idea that some computing tasks are complex and positions himself as uninformed about these aspects of computing. Through his initial statement 'I know a bit about them' (line 3) and his final statement 'I just know what I gotta know' (line 5) John positions himself as 'good enough' at computing. While in previous extracts the participants have positioned themselves as being broadly good or bad at computing, the idea of being 'good enough' or ' OK but not brilliant' was also frequently drawn upon. The extracts below provide some further illustrations of this theme:

Extract. 10 ***Debbie***

I Would you say you were good at working with computers?
Debbie I'm OK I can solve problems on it but sometimes when I get stuck (.) I need some help

Extract. 11 ***Alison***

I OK (.) would you say that you were good at working with computers ?
Alison (.) quite good (.) I can use my initiative but (.) sometimes I just get stuck and just kinda give up

Extract. 12 ***James***

I Would you say were better at working with the computer or at other types of school work ?
James Em I don't know I'm probably best writing an everything because I've done that for a long time but I don't know the c- all the computers inside out but I know them enough to do whatever I need to do

In each of the above extracts the participants position themselves as being 'good enough' at computing. Thus, Debbie (extract 10) states that she while she is 'OK' and can 'solve problems' on the computer sometimes she needs help. Similarly, Alison (extract 11) states that while she is 'quite good' (line 3) and can use her initiative when working with computers, sometimes she will 'get stuck and just kinda give up' (line 4). Finally, James (extract 12) responds to the question 'Would you say you were better at

working with the computer or at other types of schoolwork?'. In his initial response James states that he is 'probably best at writing' (line 3). He goes on to state that while he does not know everything about computers he does 'know them enough to do whatever I need to do' (lines 5-6).

The next section turns to how the participants characterised ability with computer games.

4.3. Competence with computers for games

As with computers for work, ability with computer games was also seen as something that was gained through experience. Consider extract 13:

Extract. 13 ***James***

1 *I* Yeah OK Would you say you were good at playing
2 computer games ?
3 *James* Yeah fairly good I like all the computer games I'm
4 pretty good at all of them its just em with your first computer game just
5 gotta get the hang of it an then with other computer games your
6 confident enough to try different things
7 *I* Mm hm
8 *James* So you just get better an better

In the above extract James responds to the question 'Would you say you were good at playing computer games?'. In his response to the question James states that he is 'fairly good' (line 3) and that he both likes and is 'pretty good' (line 4) at all computer games. Through these statements James positions himself as enthusiastic about computer games and as confident about his ability with them. James goes on to explain that experience with computer games increases ability and confidence: 'with your first computer game just gotta get the hang of it an then with other computer games your confident enough to try different things ... So you just get better an better' (lines 4-8). In the following extract Fiona also positions herself as being good with computer games:

Extract 14 ***Fiona***

1 *I* Right (2.0) Do you think you're good at playing
2 computer games ?
3 *Fiona* Mm Yeah sort of cause I used to play a lot I like playing
4 em (.) car racing games cause it's like you're really driving a car

5 *I* Mm
6 *Fiona* Cause like I go sometimes I go to Super Bowl and
7 actually playing like all arcades and stuff

In her initial response to a question about whether she is good at playing computer games Fiona states 'Mm Yeah sort of' and backs this up by referring to her experience with computer games 'cause I used to play a lot' (line 3). In her use of the past tense Fiona is orienting to comments she had made earlier in the interview about the fact that her computer game machine had broken. Fiona goes on to state that she likes playing computer games, and draws on the idea that computer games are realistic 'I like playing em (.) car racing games cause it's like you're really driving a car' (lines 3-5). As was the case with James in extract 12, Fiona's expression of her enthusiasm for computer games serves to add weight to her claim that she is good at playing them. In the final part of the extract Fiona provides a further example of her experience with computer games through her statement that she plays computer games at Super Bowl (lines 6-7). This statement is perhaps offered to ward off the potential inference that because Fiona's computer game machine had broken she no longer had an opportunity to play very often.

In the following extract Sarah also describes herself as being good at computer games:

Extract. 15 ***Sarah***

1 *I* Would you say you were good at playing computer
2 games?
3 *Sarah* Yeah ((laughs))
4 *I* Why's that?
5 *Sarah* Cause after school I usually go straight to the computer
6 and like my brother used to challenge and my cousins and I was always
7 winning and they would leave so I just I just when I came home from
8 school I just played on it and I learnt how to do all the moves and
9 everything

In the above extract Sarah responds yes to the question about whether she is good at playing with computer games. She warrants this through her reference to the fact that she plays computer games often: 'Cause after school I usually go straight to the computer' (line 5) and 'when I came home from school I just played on it and I learnt how to do all the moves and everything' (lines 7-9). Her description of herself as 'always winning' (line 7) when she played against her brother and cousins also serves

to position Sarah as someone who is very good at computer games. In extract 16 Colin also compares his ability with computer games with others:

Extract 16. ***Colin***

I Would you say you were good at playing computer games

Colin Probably the best one in my family the whole of my family cause anyone who plays in my family (inaud) I've played on it such a long time I've had it for a long time now I'm getting quite good at it some of the games are quite hard and I can't get past the first level but other games I'm quite good at

In the above extract Colin states that he is probably the best computer game player in his family (line 3). He warrants this by explaining that he has played computer games for a long time and so orients to the idea that ability with computer games is gained through experience: 'I've played on it such a long time I've had it for a long time now I'm getting quite good' (lines 4-5). In line 6 Colin states that with some of the 'hard' computer games he 'can't get past the first level' but this description of himself as being not very good with some computer games is tempered by his final statement 'but other games I'm quite good at' (line 7).

Most of the participants described themselves as generally good at playing computer games. One exception is presented below:

Extract 17. ***Craig***

I Are you good at playing computer games?

Craig Some of them I aren't but I tend to get a bit frustrated with some of them (.) some of them are so hard and I get a bit angry

The meaning of Craig's initial utterance 'some of them I aren't' is difficult to interpret. Craig goes on to state that he gets 'a bit frustrated' with some computer games and that 'some of them are so hard and I get a bit angry' (line 3). Here, then, Craig positions himself as sometimes finding computer games difficult and frustrating. Craig's account in extract 17 was the most negative response to the question about ability with computer games. Debbie (extract 18 below) was the only other participant who did not describe herself as being generally good at computer games.

Extract 18. ***Debbie***

I Do you ever play computer games at all?
Debbie No not really like if I went round to a friend's house and they wanted to play then I'd play but u (.) it's not really something that interests me
I So would you say you liked computer games?
Debbie I don't know I mean I don't really play them so (.) I can't really say
I Do you think you're good at playing computer games?
Debbie Again I (.) I don't know cause I don't play them

In the above extract Debbie firstly responds to the question 'Do you ever play computer games at all?'. In her initial response Debbie states 'No not really'. She goes on to explain that while she may play with a friend if they wanted to, in general, she is not very interested in computer games (lines 2-4). In response to the question about her liking of computer games Debbie states 'I don't know I mean I don't really play them so (.) I can't really say' (lines 6-7). This statement again serves to position Debbie as someone who has very little interest in computer games. Finally, in line 9 Debbie resists defining her ability with computer games through her statement 'Again I (.) I don't know cause I don't play them' . Here, Debbie resists defining herself as someone who is either good at bad at computer games; instead, she positions herself as someone who has played computer games so infrequently that she is not able to judge her ability. Debbie's response to the question about her ability with computer games is therefore best understood as part of her account that she is not interested in games.

The idea that ability with computer games was gained through experience also arose in response to the question 'So what sort of person is good at playing computer games?'. Because it was only included in the interview schedule as a possible follow up item only five of the twelve participants answered this question. Interestingly, in their response, all five of these respondents drew on the negative image of someone who plays computer games *too often*. This negative characterisation of the computer game player who plays to an *extreme* degree was discussed in Chapter 3 (pp. 38-40). A further example is provided below:

Extract 19. *James*
I OK. What sort of person is really good at playing computer games
James Em I'd say someone who's really good would have to like play computer games for all of their spare time really someone that doesn't get out much

6 *I* Right (laugh)
7 *James* So cause their playing computer games an watching TV,
8 reading magazines on the computer games so it's probably someone
9 that isn't very active

In the above extract James states that the sort of person who is 'really good' at computer games is the sort of person who; plays computer games 'for all of their spare time' (line 4), 'doesn't get out much' (line 5), watches TV and 'isn't very active' (line 9). Here, James draws on the characterisation of the computer game player as someone who has a sedentary lifestyle and who has few other interests. In extract 20, below, one of the female participants links this image specifically to boys:

Extract 20. Julie

1 I What sort of person is really good at playing computer
2 games ?
3 *Julie* I think its boys (.) cause
4 I Why boys ?
5 *Julie* Well most o- boys have got computers haven't they and
6 they normally play on them loads and loads of times (.) so I think its
7 boys that are more better at playing computers
8 I What sort of boys
9 *Julie* Em teenage boys that don't do any work at school
10 I Right
11 *Julie* They just come home and play on the computer

In extract 20, in response to the question about what kind of person is really good at playing computer games, Julie states boys 'I think its boys'. Julie accounts for this through her statement 'Well most o- boys have got computers haven't they' (line 5) and by drawing on an extreme characterisation of boys who play on computers 'loads and loads of times' (line 6). In lines 6-7 Julie adds 'I think its boys that are more better at playing computers'. Here, Julie draws on the idea that because boys are more likely to play computer games often, they are also likely to be better at playing computer games.

In the final part of the extract, in response to the interviewers prompt 'What sort of boys' (line 8), Julie again draws on the image of the male computer game player who plays computer games at the expense of other activities: 'Em teenage boys that don't do any work at school (...) They just come home and play on the computer' (lines 9-11). The idea that computer game playing was an activity that boys engaged in and

enjoyed more than girls was frequently drawn upon by the participants in their discussion of the significance of gender in relation to computing. These accounts are the main focus of Chapter 5. The next section of this chapter turns to a discussion of the extent to which gender mediated the participants characterisations of their own ability with computers.

4.4. Gender and ability with computers

One of the most striking things about the sections of interviews concerned with ability with computers was the lack of gender differences in the participants responses. Very few gender differences emerged in terms of how the participants characterised their ability with computers or computer games. As a check on these observations a quantitative comparison was performed on a small selection of the girls and boys responses. However, there are a number of considerations to bear in mind before interpreting the results of this analysis. Firstly, due to the emphasis on the variable and context dependent nature of self presentation, discourse analysis is not an approach which lends itself easily to numerical comparisons between different groups. Thus, if a participant expressed difficulties or lack of ability with computers in response to one question, this does not necessarily mean that they presented themselves in this way throughout the entire interview. It is important to point however, that the claim is not that there are *no* differences between individuals in their response to computers. Rather, it is the case that due to the variable and context dependent nature of self presentation we have to be cautious about interpreting any particular response as an underlying or 'true' representation of how the participant perceives their abilities.

A further consideration to bear in mind is the very small number of participants included in this study; any gender differences that did emerge in this study may be partly due to the fact that the sample size was not representative. With these reservations in mind, a numerical comparison was performed between the girls and boys responses to the two questions where the participants were asked specifically about their ability. The findings of this analysis are presented below.

Gender and ability with computers or work

The girls and boys responses to the question 'Would you say you were good at working with computers?' were compared. It was hoped that this comparison would

give an indication of any 'average' gender differences in the participants characterisations of their ability. The extracts considered were taken from the participants initial response to the question; responses to the interviewers follow up question were not included as these varied between different interviews. The participants responses were ranked from one (highest) to twelve (lowest) in terms of how highly they rated their ability. The girls responses were rated 1, 3, =6, 7, 10 and 11 and the boys were rated 1, 4, 5, =6, 9 and 12. There was very little difference between the average rating for girls (6.33) and that for the boys (6.17). An independent rater was asked to rank the responses (the pseudonyms were replaced by 'Respondent' so that the rater was unaware of the participants gender). The rankings of the researcher and rater were in agreement in eleven out of twelve cases. These findings suggest that there were, on average, few differences between the boys and girls in this study in terms of how highly they rated their ability with computers.

Gender and ability with computer games

The participants responses to the question 'Are you good at playing computer games?' were compared to see if there were any gender differences. The extracts included in this analysis were again taken from the participants initial response to the question only. However, one participant (Sarah) simply responded 'Yeah' to the initial question. In this case, her response to the interviewer's short prompt 'Why's that' was also included. As discussed in section 4.3. most of the participants described themselves as being generally good at playing computer games. The participants characterisation of their ability with computer games did not merit the distinction between 'good' and 'OK but not expert' that was observed in the participants characterisations of their ability with computers for work. As was also discussed in section 4.3. two participants did not describe themselves as good at playing computer games. Thus, Debbie (extract 18, p. 55) resisted defining her ability with computer games, and Colin (extract 17, p. 55) stated that he often became frustrated when playing some of the more difficult games. One female participant was not asked the question about ability with games, and since Debbie resisted defining her ability with computer games her response was not included in the ranking analysis. The responses of the remaining ten participants (six boys and four girls) were ranked from one (highest) to ten (lowest) in terms of how highly the participants rated their ability with computer games. The girls were ranked 1, 5, 6 and 8 and the boys 2, 3, 4, 7, 9 and 10.

There was very little difference between the average ranking for girls (5) and that for boys (5.83).

In summary then, these results support the observation that the girls and boys in this study were 'on average' equally confident about their ability with computers and computer games. The next section briefly considers the extent to which there were any differences in the girls and boys expressed enthusiasm for computers.

4.5. Gender and enthusiasm for computers

The way in which the participants characterised their liking or enthusiasm for computers was partly addressed in Chapter Three in the discussion of the different 'metaphors of computing' that the participants drew upon across the interviews. As we saw in that chapter, the participants employed both negative and positive characterisations of computers and computer games across different contexts of the interview. This section briefly considers the extent to which any gender differences emerged in terms of the participants expressed enthusiasm for computers.

Gender and liking of computers for work

Due to the fact that the question concerned with the participants liking of computers was of the form 'What *kinds of things* do you like doing on the school computer?', the participants responses could not be analysed in terms of whether they presented themselves as generally enthusiastic or unenthusiastic about computers. Instead, these accounts were inspected to see if there were any gender differences in the *kinds* of the things that boys and girls said they liked doing on computers. However, the considerations discussed above about the context dependent nature of the participants responses, and the small size of the sample, also have to be borne in mind when interpreting the results of this analysis.

An example of one of the participants responses to the question about liking of computers is given below:

Extract 21. ***Alison***

1 *I* What kinds of things do you like doing on the school
2 computer ?

3 *Alison* (ah the) I like the badge making I do like designing (.)
4 um (.) I like doing spreadsheets actually ((*laughs*)) and (.) I d I don't
5 mind typing out stories and stuff like that (.) I don't (.) I don't like
6 some of the English that we do

In the above extract Alison lists a variety of activities that she likes doing on the school computer. She initially states '... I like the badge making I do like designing' (line 3). Here, Alison is referring to an activity in which she and her classmates had used a design programme to design badges. Alison also states 'I like doing spreadsheets actually' (line 4) and 'I don't mind typing out stories and stuff like that' (lines 4-5). Finally, in lines 5-6 she states that she does not like 'some of the English'. It was common for the participants to list a variety of activities in response to the question about likes of computers. Another frequent response was to describe more general characteristics of computing. Consider extract 22 below:

Extract 22. *Pete*

1 *I* Yeah OK What kind of things do you like doing on the
2 school computer?
3 *Pete* Um there's (.) I actually enjoy a challenge on the
4 computers (.) finding out how to do something or finding out something
5 new (.) but mainly I eh like playing on a game called Specs which is a
6 design game which is like the only one on there

In the above extract Pete states that he enjoys 'a challenge on the computers' (line 3) and that he likes 'finding out how to do something' (line 4). The idea of 'finding things out' or 'just exploring', was also frequently cited by the participants as something they enjoyed doing on computers. In the final part of the extract Pete states that he likes playing a design game called Specs (lines 5-6).

A content analysis was performed on the participants accounts to see if there were any differences in the kinds of things the boys and girls cited as an aspect of computing that they enjoyed. Four categories emerged from the participants responses. Three of these categories were references to specific computing activities; references to typing, or using the computer for writing; references to games; and references to Art programmes, or using the computer for drawing. A fourth category 'general characterisation' included the participants references to general features of computing that were not linked to a particular activity e.g.: 'Just playing around with it'. Some gender differences did emerge in the participants responses. Four girls, compared to

only one boy, cited typing or writing on the computer as an activity that they liked. Furthermore, the boy that did cite typing referred to 'typing the commands that you want the computer to do' rather than to using the computer for word processing. Four boys, but no girls, cited games as an activity they liked doing on the school computer. However, two of these references were to programmes that may not have been defined as 'games' by other participants: 'playing the painting games' and 'playing a design game called Specs'. Three girls and two boys referred to Art packages or drawing on the computer. Four of the boys and one girl referred to a general feature of computing which appealed to them. While it would be unwise to draw any conclusions on the basis of this analysis alone these findings do suggest that there may be some gender differences in the kinds of things children enjoy doing with computers.

In response to the question about dislikes ('Is there anything you dislike about using the computers for school work'), rather than cite specific activities, the participants mainly drew on one of the global negative characterisations of computers discussed in Chapter Three. This may be partly due to the wording of the question. An example is provided in extract 23 below:

Extract 23. ***Julie***

1	I	Is there anything you dislike about using computers for
2	school work	
3	*Julie*	No not really I just don't like when they're broke
4	I	So when does that happen
5	*Julie*	I dunno when we were doing English it didn't save my
6	work	
7	I	Right
8	*Julie*	So I had to do it all over again

In her initial response to the question Julie states 'No not really'. As discussed in chapter three the participants often made qualifications of this kind before drawing on a negative characterisation of computers. One possible function of these qualifications is that they ward off the potential inference that the participants is generally negative about computers. After making the qualification Julie states 'I just don't like when they're broke' (line 3). In response to the interviewers prompt 'so when does that happen' (line 4), Julie refers to an occasion when she lost some of her work and states 'so I had to do it all over again' (line 7). Here Julie draws on the idea that due to computing problems, computers can sometimes be frustrating to work with.

In response to the question about dislikes four boys and four girls drew on one of the negative characterisations of computers discussed in Chapter three. Five participants referred to a specific activity; drawing (one boy); typing (one boy); 'trying to find the keys' (one boy); spreadsheets (one girl) and composing stories on the computer (as opposed to writing them out by hand first) (one girl). One boy and one girl stated that there was nothing they disliked about working with the computers. One boy stated that overall he hated computers: 'I just overall I ha I hate computers'. Thus, no pattern of gender differences emerged in the kinds of things the girls and boys said they disliked about using computers.

In order to further explore the extent to which gender informed the participants expressed enthusiasm for computers, the participants responses to the question 'Would you like to work with computers when you are older?' were examined for any gender differences. The participants initial response to the question were ranked from one (highest) to twelve (lowest) in terms of how strongly enthusiastic they were about working with computers when they were older. The girls were ranked 1, 2, 6, 8, 9 and 10 and the boys were ranked 3, 4, 5, 7, 11 and 12. There was very little difference between the average ranking for the girls (6) and the average ranking for the boys (7).

The responses to the original question about working with computers and to the interviewers follow up; 'What kind of computer work can you see yourself doing', were inspected to see if there were any gender differences in the kinds of computing activities cited by the participants. Among the six participants who did cite a specific activity or occupation some gender differences did emerge. Two of the girls stated that they might use computers when they were older because they may become a secretary. However, one of the girls qualified her response: 'Probably a secretary or something different (.) I- I don't know if I'll use computers all my life'. A third girl stated that she may use computers for word processing if she went to University or College. Of the boys who cited a specific activity or occupation, one stated that he may get a job working for a sports company and that he may use computers for 'designing clothes'. A second boy stated that he may use computers for 'organising files'. A third boy stated that he may use computers for typing. However, this response was also somewhat qualified: 'Typing I suppose'. It would be unwise to draw any firm conclusions on the very small differences observed here. However, these differences, together with the gender differences in the kinds of activities the participants said they liked doing in the school computer, suggest that girls and boys responses to computers

may be differentiated, not in terms of their overall attitude to computers, but in terms of their enthusiasm for and participation in different computing activities.

Gender and liking of computers for games

The girls and boys responses to the question about liking of computer games 'Do you like playing the games?' did not lend themselves to a comparative or ranking analyses. This was due to the fact that one participant was not asked the question and five of the participants simply stated 'yes' in their response. However, across the sections of the interview concerned with computer games most of the participants presented themselves as either very enthusiastic or generally enthusiastic, and accounted for their enthusiasm by drawing on the characterisation of computer games as exciting and fun discussed in Chapter Three. Only one participant (Debbie, extract 18, p. 55) positioned herself as generally uninterested in computer games.

The girls and boys responses to the question about liking of computer games were compared in terms of the kinds of games mentioned. The participants mentioned a wide variety of games. Of the games (or types of games) referred to by more than one person some gender differences did emerge. Two girls, and no boys, mentioned 'Car racing games'. Three girls and no boys mentioned 'Sonic the Hedgehog'. Six boys and no girls referred to either football games generally or a specific football game (Championship manager or Fifa '96). Again, while the small differences observed here do not merit any strong conclusions they do suggest that while both girls and boys seem to be generally enthusiastic about computer games there may be some differences in the kinds of games they choose to play.

4.6. Summary of Chapter Four

This Chapter explored how the participants defined competence with computers. The participants positioned themselves as competent with computers for work by referring to their experience with computers, and by describing themselves as 'knowing what to do' and being able to help others with computing problems. Lack of competence with computers was characterised in terms of lack of experience with computers, and as having to ask others for help. Positioning oneself as competent with computers for games was also achieved by referring to ones experience with computers, and on some

occasions by comparing ones abilities to those of others. Very few differences emerged between the girls and boys in terms of how highly they rated their ability with computers. While a comparative analysis of girls and boys overall enthusiasm for computers was not possible, some differences did emerge in the kinds of things the girls and boys said they liked doing. Similarly, while there were few differences in how enthusiastic the girls and boys were about working with computers when they were older. Some differences did emerge in the kinds of thing they said they might do. These findings suggest that girls and boys may differ, not in their overall attitude towards computers, but in terms of their enthusiasm for and participation in different computing activities. The extent to which gender mediates girls and boys interactions with different computing activities is likely to be an important area for future research.

Chapter Five: Talking About Gender and Computers

5.1. Introduction

The chapter looks at the way the participants addressed the issue of gender differences in response to computers. The extracts in this chapter were drawn mainly from the second half of the interviews (questions 19-26, Appendix A). In this section of the interviews the issue of gender differences in relation to computers was raised explicitly. That is, the children were asked questions such as 'Do you think computer games are suitable for both boys and girls?', 'Are girls and boys equally good at using computers for schoolwork' and so on. The participants were also asked to read and comment on a small number of newspaper headlines which addressed the topic of gender and IT (e.g.: 'Computers are not a girls best friend', 'Technology lessons will fight gender stereotypes'). These types of questions were included in the interview schedule with the aim of exploring how the children *themselves* reasoned about the significance and meaning of gender in these contexts. However, the explicit wording of these questions again raises the issue of the extent to which the participants responses are occasioned by the interview schedule. As we shall see, while it is certainly true that the interview questions *made relevant* the idea that there may be gender differences in children's response to computers, the character of the participants responses suggest that they were not merely passively responding to the interviewers cues. For example, while the participants agreed with the suggestion that there may be gender differences in children's interactions with computer games, they often strongly resisted the idea that there were any comparable differences in children's responses to computers in school.

In contrast to previous Chapters, this Chapter presents the extracts concerned with the use of computers for games before those which addressed the use of computers for work. This structure reflects the order in which these issues were raised in the interview schedule, and will give the reader a sense for the way the contrast between the participants responses to these to issues emerged. Section 5.2. looks at how the participants negotiated the significance and meaning of gender in the use of computer for games, and Section 5.3 at the significance attributed to gender

in the use of computers for work. Finally, Section 5.4 presents a brief summary of the issues raised in this chapter.

5.2. Gender and computers for games

One of the most striking things about the sections of interview concerned with gender and computer games, was the way in which girls and boys liking of computer games were characterised in terms of traditional gender stereotypes. Consider the following extract:

Extract 1. ***Pete***

I So do you think the ones [Computer games] in the shops actually appeal more to the boys?
Pete Yes because (.) it's like films (3.0) a boy wants to see a violent film well, nine out of ten, and a girl wants to see a romantic or an adventure film so um
I So what kind of games do boys like then?
Pete Boys (.) violent ones platform er well no, girls would like the platform ones violent, plane simulators quite a lot football it's really ones that are completely opposite to the girls but I'm not saying that girls don't like those sort of games cause some of them do
I What kind of games do the girls like?
Pete Platform ones I see my sister playing my (snares) quite a lot a platform game and I think that's because it's quite innocent and it's just sheer fun jumping around

In the first part of extract 1 Pete responds to a question about whether computer games in the shops appeal more to boys. In his response to the question Pete agrees with the interviewers suggestion and backs up his claim with the statement 'It's like films' (line 3). After a long pause he goes on to elaborate this analogy. In lines 4-6 he draws on traditional gender stereotypes; boys want to see 'violent' films whereas girls want to see 'romantic' or 'adventure' films. The phrase 'well nine out of ten' makes his claim more feasible as it acknowledges that while there may be some exceptions, *on the whole* this is *just the way things are.* In the first part of this extract then the claim that computer games are more appealing to boys is warranted by the assertion that such preferences are just part of whole set of gender differences that permeate many aspects of everyday life. Accounting for gender differences with computers by reference to more global gender stereotypes,

or to other gender typical behaviours, was a fairly common feature of the interviews.

The long pause in line 4 is also worthy of comment, although it is difficult to give a definitive interpretation. One possibility is that the utterance 'It's like films' may have been offered as a complete answer to the question, and it is only the interviewers silence that prompts Pete to give a further justification for his statement. As we shall see, phrases such as 'It's just like that' were frequently offered in response to questions where the children were asked to account for gender differences.

In the next section of the extract (lines 7-11) Pete responds to a question about what sort of games boys like. Pete lists features of games that might appeal to boys, these are stereotypically masculine 'violent', 'plane simulators', 'football' (lines 8-9). An interesting feature of this extract is the implication in the account that there is no crossover between the boys and girls tastes. Thus Pete begins to say that boys would like platform games, but retracts this assertion with the statement 'no, girls would like the platform ones' (lines 8-9). Similarly his statement 'it's really the ones that are completely opposite to the girls' (lines 9-10) serves to construct girls and boys tastes as completely polarised. In lines 10-11 Pete makes a disclaimer 'but I'm not saying that girls don't like those sort of games cause some of them do. This statement is perhaps offered to ward off the possible inference that Pete is biased in his opinion.

In the final part of the extract (lines 13-15) the metaphors employed to describe girls preferences in computer games are in contrast to those used to characterise boys. Pete states that girls would like platform games because they are 'quite innocent' and 'just sheer fun'. The example of his sister who he has 'seen' playing such games serves to add authority to this account. In extract 2 John also characterises girls and boys preferences for computer games along traditional gender lines:

Extract 2 ***John***

1	I	Do you think this game would appeal more to boys than
2	girls ?	
3	John	Boys
4	I	Why ?

5 John It just looks like (4.0) cause it looks like a boys game
6 scarier and more evil sort of thing (.) but girls you must have got
7 colours on the packet or something knowing that it's going to be like
8 an interesting game (.) exciting (.) but that is like a serious game to me
9 helicopter or an aeroplane going to get blown up or something

In extract 2 John responds to a question about an advert for the game ThunderHawk . The interviewer prompts him to explain why he thinks this game would appeal more to boys. In his initial response he states 'It's just looks like' (line 5). As stated above, phrases such as 'It's just like that' were often offered in response to questions where the participants were asked to account for gender differences. This type of response appeals to the idea that gender differences are an inevitable part of everyday life, and so serves to construct the answer to the question as obvious and in need of no further explanation. While in some instances the use of such phrases was effective in ending the topic of discussion, in the above extract (after a long pause) John offers a further account. In lines 5-9 he draws on the idea that there are certain visual cues in the advert that make it more appealing to boys; 'scarier' and 'more evil' (line 6) and a 'serious game...' (lines 8-9) . These characteristics are contrasted with the kinds of things that might appeal to girls 'colours on the packet' indicating a more 'interesting ... exciting game' (lines 7-8). In extract 3 Fiona also draws on the idea that girls and boys like different kinds of computer games:

Extract 3 ***Fiona***

1 *I* So what sort of games appeal to boys do you think
2 *Fiona* Don't know em games like Mortal Combat I think it's
3 called I'm not sure ((*laugh*)) can't remember
4 *I* And what about girls ? Is that the same or
5 *Fiona* Things like Sonic an like all cute characters like girls
6 tend to like
7 *I* Have you heard of this game ?
8 *Fiona* ThunderHawk no
9 *I* Do you think it would appeal more to boys (or girls)
10 *Fiona* I think it'll (.) appeal to more to boys
11 *I* Why is that then
12 *Fiona* Don't know just tt (.) just the title when like (.) just like
13 the cover in'it
14 *I* What is it about it that makes it
15 *Fiona* I dunno its like s:pacesh: like sh: whats it what's them
16 called I don't know like a- fire(.) storm ((*Here Fiona is reading the*
17 *text on the 'ThunderHawk 'advert*)) Yeah it looks like a (.) spaceship

Yeah spaceship sort of thing and like (.) boys like (.) it's probably (.) you go in the game an you get a spaceship and you have to shoot all the different things in space (.) like more boys- I don't know (.) it's like more boys like to play with guns and stuff and girls don't

In extract 3 Fiona initially responds to a question about what kinds of games appeal to boys. In her response Fiona cites 'Mortal Combat'. Through her initial response 'Don't know' (line 2), and her statement in lines 2-3 that she is unsure about the name of 'Mortal Combat', Fiona positions herself as unfamiliar with the kinds of games boys like. In response to the question about girls preferences Fiona cites 'Sonic' and that girls tend to like 'all cute characters' (line 5). Here, then, Fiona also draws on the idea that girls and boys like different sorts of games and that these preferences fall along traditional gender lines.

Another interesting feature of extract 3 is the way in which Fiona accounts for her assertion that the game ThunderHawk may appeal more to boys. In lines 18-21 she describes the action of playing the game 'you go in the game and you get a spaceship and you have to shoot all the different things in space...'. Through her emphasis on the word 'shoot' and her statement 'it's like more boys like to play with guns and stuff and girls don't' (lines 20-21) Fiona characterises the experience of playing this game as something which is more likely to appeal to boys. Similar features can be seen in extract 4 below:

Extract 4 *Amy*

I em do you think that computer games are suitable for both boys and girls
Amy Some are some like car racing I don't think girls really like them very much or but there are things more for girls like tennis like boys don't really like playing tennis games and Donkey Kong well that's like for both really
I OK so what sort of games appeal to boys then
Amy Car racing things like that (.) mostly
I What about girls what sort of games
Amy Its like (.) like em Marrow Cart that's quite good cause its different than racing cause its got little characters on it and you get little things that you can shoot people with as you go round
I So what is it about those games that girls prefer do you think
Amy More colourful than sort oh like just shooting everything like on like if you're in aeroplane or something or a spaceship and you have to shoot everything then it just gets a bit boring really

In the above extract, in response to a question about whether computer games are suitable for both boys and girls, Amy initially states that girls are inlikely to like car racing games (line 3). She then draws attention to the fact that there are games which have more inherently 'female' characteristics: 'but there are things more for girls like tennis...' (line 4) She also highlights the fact that some games may appeal to both boys and girls (lines 5-6).

In the next section of the extract, in response to the questions about what kinds of games appeal to boys and girls, Amy continues to appeal to stereotypically male and female characteristics. Thus, in line 8 she re-iterates her claim that car racing games are unlikely to appeal to girls. In response to the question about what kinds of games girls like, Amy cites 'Marrow Cart' (line 10). She draws a contrast between Marrow Cart (which appeals to girls) and racing games (which appeal to boys) through her statement 'its different than racing cause its got little characters on it and you get little things that you can shoot people with as you go round' (lines 11-12). Amy elaborates on this contrast in lines 15-18 in response to the interviewers follow up question: 'So what is it about those games that girls prefer do you think'. Here, Amy intially states 'More colourful'. She goes on to characterise the kinds of games that boys like as uninteresting: '... if you're in aeroplane or something or a spaceship and you have to shoot everything then it just gets a bit boring really' (lines 16-18). It is interesting to note that although Amy stated 'you can shoot people with as you go round' (line 12) to characterise Marrow Cart as the kind of games girls would like, the idea of '*just* shooting everything' was employed to characterise boys games as somewhat boring and mundane.

As was discussed in Chapters Three and Four, when characterising computer games and the actitivy of playing computer games the participants frequently drew on the image of the solitary computer game player who plays computer games to an excessive degree. As was also discussed, one of the participants (Julie, extract 23, Chapter 4, p. 61) linked this image specifically to boys. The idea that boys might be more regular and enthusaistic computer game players than girls also arose in the sections of interview concerned with gender. For example, consider the following extract:

Extract 5 ***Fiona***

I Mm This article says that girls aren't as interested in computers (.) as boys (1.0) tt Is that true do you think

Fiona Mm (.) What as in girls don't like it as much as boys?' (2.0) In a way probably

I Right

Fiona Because you don't see many girls at home with a computer just sitting in front of it playing with it playing it's mostly boys

In the above extract Fiona responds to a question about one of the newspaper headlines which suggested that girls were not as interested in computers as boys. In her response Fiona firstly repeats the suggestion in the question 'What as in girls don't like it as much as boys?' (line 3) and then, after a pause, states 'In a way probably' (line 4). Despite this somewhat tentative agreement with the suggestion that boys may be more interested in computers, Fiona goes on to offer an explantation for why this might be the case: 'Because you don't see many girls at home with a computer just sitting in front of it playing with it it's mostly boys' (lines 7-8). Here, then, Fiona implies that boys are much more likely to spend prolonged periods of time playing computer games. It is interesting to note that (as was the case with Julie, extract 23, Chapter 4, p. 61) the characterisation of the solitary male computer game player that Fiona draws upon is a negative one. Thus, through her statement 'you don't see many girls at home with a computer just sitting in front of it playing with it' (lines 6-8) Fiona implies that boys play computer games to an excessive degree. While the girls were occassionally negative or derogotary about boys prefences or greater interest in computer games, boys were rarely negative when characterising girls interactions with computer games. This may be due to the fact that the interviewer was female, in other contexts boys may draw upon more negative evaluations of both the types of computer games girls like, and their relativley lower interest in games.

In extract 6 Colin describes girls as less interested in computer games than boys:

Extract 6 ***Colin***

I Are they equally interested [girls and boys] in computer games

Colin Some when you get older girls don't really like computer games they go onto like parties and discos and they don't sometimes girls like if you've got a PC like playing on them but if

6 you've just got a Megadrive or a P- em CD-ROM or something like
7 that eh or a Playstation you some girls don't really wanna play on them
8 so they go off and go out (.) but boys they don't mind staying in and
9 playing

In extract 6 Colin responds to a question about whether boys and girls are equally interested in computer games. In response to the question Colin states that some 'older girls' are interested in things other than playing computers such as going to 'parties and discos' (line 4). He further explains that while some girls might like playing computer games on a PC (line 5), rather than play on console games like Play Station they would prefer to 'go off and go out' (lines 8 -9). Colin contrast the preferences of girls with those of boys who '*don't mind* staying in and playing' (lines 8-9). Through the use of the phrase 'don't mind' Colin also orients to the idea that playing computer games all the time is not necessarily desirable.

In addition to the idea that boys were keener computer game players than girls, the participants also frequently oriented to the idea that boys were *better* at playing computer games. The greater ability of boys was most frequently attributed to their greater experience with games. For example consider extract 7 below:

Extract 7 ***Pete***

1 *I* OK are boys and girls equally as good at playing
2 computer games?
3 *Pete* They can be it's not something in their genes that says
4 that girls can't play computer games and boys can, it's just that boys
5 get a lot more practice don't they? If girl's were actually given the
6 chance from an early age to play computer games when they wanted
7 and they actually enjoyed them (.) then I'm sure they could beat
8 everyone

In extract 7 Pete responds to a question about girls and boys ability with computer games. In his initial response to the question Pete implicitly orients to the idea that boys are better than girls, but asserts that this is not necessarily inevitable: 'They can be it's not something in their genes that says that girls can't play computer games and boys can, it's just that boys get a lot more practice don't they?' (lines 3-5). He goes on to state that if girls were 'given the chance from an early age to play computer games...' (lines 5-6) and they enjoyed playing computer games then

'they could beat everyone' (lines 7-8). Here, Pete implicitly orients to the idea that girls are somehow discouraged from playing computer games.

The following extract also displays many of the features discussed so far:

Extract 8 ***John***

I Do you think that computer games are suitable for boys and girls?
John Yeah (.) it just depends whether they like what's out (.) if they don't like football then they don't like football (.) I reckon most of them are for boys as well well girls games I don't know (.) it's just the way you look at the games it looks more boyish but Rachel she when we used to go to (.) school we used to like take a ball every day (.) and dinner-time we had an hour and ten minutes break and she used to be with us every minute of that break (.) she never used to be able stop playing football she was there and everything (.) but she never gets bored with games cuase she's been up my house as well with Charlotte this other girl and we play on my computer games and she don't stop (.) she likes it so (.) it depends on what girls think (.) but then some girls would rather go out than play games and then when it comes to playing the game they think going out's better then this game's boring why can't they make (inaud)

There are many interesting features of this extract, one important feature to consider is the way John builds up a narrative about the fact that some girls do like computer games. In order to do this John uses the example of a female friend who is interested in football (lines 6-11). By using such an example John orients to the fact that computer games might be regarded as something more appealing to boys. A girl who likes football (another typically 'male' activity) is easily characterised as someone who also likes computer games. It is also worth noting that John characterises his friend's liking for football as something she was keen to do *all the time*: 'she used to be with us every minute of that break ... she never used to be able to stop playing football' (lines 9-10). Similarly, her liking for computer games is characterised as something which she 'never gets bored with' (line 11) and which she 'don't stop' (line 13). Here, then, John warrants the claim that *some* girls like computer games by describing a female friend in terms of characteristics frequently employed to describe male computer games players.

Similar features can be seen in extract 9:

Extract 9 ***Debbie***

I [...] Do you think computer games are suitable for both boys and girls ?

Debbie Yeah definitely (.) I mean um computer games are based on action (.) but I mean a lot of girls are into that a lot of girls are into football it's just the same

In extract 10 Debbie strongly agrees with the suggestion that computer games are suitable for *both* boys and girls. However, in her next statement 'computer games are based on action' (lines 3-4) Debbie orients to the idea that computer games may be *thought* to be more appealing to boys. She goes on to undermine this idea through her statement 'but I mean a lot of girls are into that' (line 4), and her further assertion that 'a lot of girls are into football' (lines 4-5). Here again then the idea that girls *are* interested in computer games is warranted by the claim that some girls like football.

The next section turns to a discussion of how the participants dealt with the significance of gender in the use of computers for work.

5.3. Gender and computers for work

In contrast to the extracts discussed above, in the section of the interview concerned with school computer use most of the participants resisted the idea that there were gender differences in children's interest in or ability with the use of computers in school. For example, consider extract 10 below:

Extract 10 ***Sarah***

I What about using computers at school are girls and boys equally good at using computers at school?

Sarah Yeah cause they help each other on what to do if I need help Steven helps me if he needs help I then help him or we just help each other

I Are they equally interested (.) girls and boys?

Sarah What in school computers? I would say they um yeah

I Are there any differences between girls and boys when it comes to computers do you think?

Sarah No

In the above extract Sarah answers a question about whether girls and boys are equally able with computers in school. Sarah responds yes to the question, and backs this up by explaining that girls and boys 'help each other on what to do' (line 3). She goes on to cite an example of one of her fellow male pupils who helps her with computer problems. Sarah's emphasis on the fact that she and Steven *help each other*; 'if I need help Stephen helps me if he needs help I then help him' (lines 3-4) serves to add weight to her claim that girls and boys are equally *able* when using school computers. Sarah also responds yes to the question about whether girls and boys are equally interested in the school computers. Through her use of the phrase '*I would say* um yeah' (line 7) Sarah orients to the idea that she may not be an authority on this issue. Finally, in line 10, Sarah responds 'no' to question about whether there are any differences between girls and boys in their use of computers. In extract 11 Amy also states that girls and boys are equally good at working with computers:

Extract 11 ***Amy***

1 I What about using computers in school (.) do you think
2 girls and boys are equally good at using (...) for school work
3 *Amy* Yeah
4 I Are they equally interested ?
5 *Amy* Yeah I think some most- a lot of boys don't like it a lot
6 of boys do and a lot girls don't like it and a lot of boys and girls do

In the above extract Amy also responds yes to the question about whether girls and boys are equally able with computers in school. In her response to the question about girls and boys interest in school computers Amy states: 'a lot of boys don't like it a lot of boys do and a lot girls don't like it and a lot of boys and girls do' (lines 5-6). Here, Amy draws on the idea that interest in computers is a matter of individual preference and that gender is irrelevant in whether a person likes or dislikes computers.

The participants frequently resisted the idea that there may be gender differences in girls and boys ability with computers in school. In some contexts this idea was combined with the assertion that if there were any differences, girls were likely to be better at computer work than boys. For example consider extract 11, below:

Extract 12 ***Colin***

I OK What about using computers in school are girls and boys equally good at that

Colin Yeah because em for Tech if you do Tech work girls and boys are in there's mixed like sex or girls and boys so em girls learn and so do boys an mainly the girls do better than the boys at that because the boys are either talking or they're not listening or something and the girls are paying like attention

I Mm-hm

Colin But yeah girls are the same as boys on that yeah

In extract 12 Colin also responds yes to the question about whether girls and boys are equally able with computers in school. Colin backs this up through his statement that there is 'mixed like sex' (line 4) in the Technology lessons and that 'girls learn and so do boys' (lines 4-5). Colin goes on to suggest that girls may do better in the Technology lessons than boys because 'boys are either talking or they're not listening or something and the girls are paying like attention' (lines 6-7). Here Colin draws on the idea that boys are, in general, more badly behaved than girls and that this may detrimentally effect boys learning. Finally, in line 8 Colin states 'But yeah girls are the same as boys on that yeah'. Through this statement Colin is perhaps orienting to his earlier comments about the fact that there may be differences between girls and boys in their interest in computer *games* (extract, 6, p. 71). Thus, his use of the phrase 'girls are the same as boys *on that* yeah' (line 9) Colin implies that while there may be gender differences in the use of computers for games, there are no such differences in the use of computers in school. James draws explicitly on this idea in extract 12:

Extract 12 ***James***

I Yeah OK What about using computers in school ? Are girls and boys equally good at using the computers for schoolwork

James .hh Well em not many girls have computers at home like console so the games side they probably wouldn't be as good as boys but em with the em PC side a lot of girls have computer home computer like PCs so em they be equally as good because the teachers teach everyone not just the boys

I Yeah yeah are they equally interested in your school computers

James Yeah I think so because em its just the school computers are used for work you can't really play games on them unless you're in you're free time so they could pro- they equally interested

In the above extract, in response to a question about girls and boys use of computers for school, James initially states that becuase fewer girls have 'console' games (Sega, PlayStation etc.) at home they are probably not as good as boys at games. He goes on to state that because girls often have a PC computer at home, and because; 'teachers teach everyone not just the boys' (lines 6-7) girls and boys will be equally good with these types of computers. In his response to the interviewers question about girls and boys interest in school computers, James agrees with the interviewers suggestion that girls and boys will be 'equally interested' (lines 12-13). James backs this up through his statement 'the school computers are used for work you can't really play games on them' (lines 10-11). Here again then, James draws on the idea that while boys may be better at computer games, they have no such advantage when using the computers for work.

The extracts discussed in this Chapter illustrate that the participants attributed a different significance to gender across the contexts of computers for work and computers for games. Extract 13 provides an illustration of how one of the participants drew this contrast:

Extract 13 ***Julie***

I OK Are boys and girls equally good at playing computer games
Julie I think boys are better than playing at girls
I Why's that ?
Julie Don't know boys have got more talent in them than girls. (.) Sorry but I think they are they they've got more talent when they're playing computer games
I So do you think they're equally interested are girls as interested in computer games as boys
Julie No I think boys are more interested than girls cause girls have got different things to do than play on computers
I What about using them in school are girls and boys equally good at using computers for schoolwork
Julie Yeah, Yeah I think so because most girls like playing well using the keyboards and writing things down but boys don't like that I don't think I think they maybe think its boring

In the above extract Julie firstly responds to a question about girls and boys ability with computer games. In her initial response Julie states that she thinks boys are better at playing computer games than girls (line 3). In response to the interviewers prompt Julie draws on the idea that boys are somehow inherently

better at computer games than girls 'Don't know boys have got more talent in them than girls...they've got more talent when they're playing computer games' (lines 5-7). In her use of the word 'Sorry' (line 6) Julie orients to the fact that her statement about boys greater ability with computer games may be controversial.

In her response to the interviewers question about interest in computer games Julie again states that boys will be more interested than girls (line 10). She back this up with her statement 'girls have got different things to do than play on computers' (lines 10-11). Here Julie implicitly draws on the idea that boys play computer games to an excessive degree and at the expense of their involvement in other activities. This statement also serves to position girls relative lack of interest in computer games as positive. It is worth noting though that in the section of the interview concerned with computer games Julie positioned herself as an enthusiastic computer game player (Chapter 3, p. 37, extract 10).

While Julie characterised boys as keener and more able with computer games, she agreed with the suggestion that girls and boys are equally able with the school computers (lines 14-16). Here, Julie implies that girls interest may be greater than boys because girls like 'using the keyboards' (line 15) whereas boys may 'think it's boring' (line 16). It is interesting to note that while Julie begins to say that most girls 'like playing' (line 14) with the keyboards she retracts this and states 'well *using* the keyboards'. This is perhaps due to the fact that had Julie used the formulation 'girls like *playing* the keyboards' this may have seemed contradictory to her earlier statements about girls relative lack of interest in computer games.

Besides resisting the idea that there were gender differences in ability and enthusiasm for computers in school, the participants also frequently resisted the idea that girls may be somehow be disadvantaged in terms of access to computing:

Extract 14 ***Debbie***

1 *I* This is talking about school computers and it says girls
2 in senior schools are being left far behind in learning how to use
3 computers
4 *Debbie* NO I mean we're mixed classes so we're all taught exactly the
5 same now so (.)

In the above extract the interviewer refers to a newspaper article headline ('Computers are not a girls best friend') and suggests that in senior schools girls 'are being left far behind in learning how to use computers' (lines 2-3). Debbie strongly disagrees with the suggestion in the question through her emphasis on the word 'No' and her statement 'I mean we're mixed classes so we're all taught exactly the same now so' (lines 4-5).

In the following extract Colin also resists the idea that girls are disadvantaged in their access to computers in school.

Extract 15 ***Colin***

I OK this one says 'Boys muscle in on the keyboard' and it says that em boys tend to dominate the computers in school and the girls don't get as much of a chance to use them (.) do you think that's true

Colin Well one of my friends used to have their tutor room as the computer room whenever I went up there to see em there was mainly loads lots of girls on the good computers better computers and the em ones that there's newer ones and the other the boys were on the not so good ones

In extract 15 the interviewer refers to the newspaper article headline 'Boys muscle in on the keyboard' and suggests that boys tend to dominate the computers in school. In his response Colin resists the implication that boys dominate the computing resources in school. He does so by referring to the fact that when he visited a friends tutor group there were 'mainly loads lots of girls on the good computers ... and the boys were on the not so good ones' (lines 7-9). Thus Colin suggests that far from being disadvantaged girls may have greater access to the computing resources than the boys.

Gender and computers in the workplace

One of the newspaper headlines discussed in the section concerned with gender and computers for work referred to the lack of female involvement in the computing industry; 'Hi-tech calls on women to plug skills gap'. The participants were read this headline and asked why they thought there were fewer women than men in the computing industry. An interesting difference emerged between the girls and boys responses to this question. Three of the boys explained the lack of

involvement on the part of women in terms of their lack of experience with computers when they were young. Two of these three linked this lack of experience to girls lack of involvement in computer games. An example of one of the boys responses is presented below:

Extract 16 *James*

I Why do you think not enough women go into the computing industry

James Because of em the interest when their child is like not their because of the computer games being mostly for boys they em the interest has gone completely so they don't it probably don't even enter their mind to em work with computers because they don't even like them

In the above extract James accounts for women's lack of involvement in the computing industry in terms of their lack of interest when they were young. He states that this is due to the fact that 'computer games are mostly for boys' (line 4). It is interesting to note that one of the interview questions referred to a newspaper article which suggested that computer games were mostly for boys. James's account then may, in part, be referring back to that earlier discussion and be drawing on an idea suggested by the interviewer. James states that because computer games are mainly for boys women's interest 'has gone completely' (line 5) and that 'it probably don't even enter their mind to em work with computers...' (lines 5-6). In this way James constructs women's lack of involvement in the computing industry as due to their 'socialisation', in that they are not encouraged to become involved in computer games when they are young. Implicit in James account is the idea that the use of computers for games fosters an interest in the use of computers for work.

As stated above three of the boys accounted for women's lack of involvement in the computing industry in terms of their lack of experience when they were young. One other boy stated that women were probably just as capable with computers as men but they may prefer to stay at home and look after the children. A fifth boy stated that women may think computing was more of a 'man's job'. However, he qualified this statement by citing an example of a women he knew who used computers 'all day'. The sixth male participant stated that he did not know why there were less women in the computing industry. The boys then drew on a variety

of explanations to account for women's lack of involvement in the computing industry. The girls responses to this question were somewhat more uniform and drew on a different account than was used by any of the boys. In their responses to the question, four of the girls constructed women's lack of involvement in the computing industry as a positive choice on the part of women. Three of these participants drew on the idea that women may not become involved in the computing industry because they did not wish to work with computers. An example of one of the girls accounts is given below:

Extract 17 ***Amy***

I This one[Newspaper article] says that computer companies can't get enough women to come and work for them (.)why do you think not many women go into the computing industry ?
Amy Because there's like dunno its just like they probably don't (.) a lot of people like they'd rather be like a secretary or something like that but some (.) quite a lot of people may find them quite boring computers especially if they're just like typing things out on them all day and they probably don't wanna do that all the time
I But why do you think there's less women than men
Amy Don't know really its just that its just cause I think probably men feel the same as the women its just there is more men

In her response to the question Amy states that 'a lot of people like they'd rather be like a secretary or something' (lines 5-6). Amy goes on to state that some people may find computers 'quite boring' (line 7) and draws on the idea that working with computers can be mundane 'especially if they're just like typing things out on them all day and they probably don't wanna do that all the time' (lines 7-8). It is interesting to note how Amy's account is constructed to undermine the significance of gender differences. Thus Amy states that 'a lot of *people*' (line 7) may find working with computers boring as opposed to just women. Similarly, when the interviewer returns to the idea that there are less women in the computing industry (line 9) Amy again undermines the significance of gender differences. Thus Amy suggests that women and men's enthusiasm (or lack of it) for computers is similar: 'I think probably men feel the same as the women' (lines 10-11). Amy's repeated use of the word just 'its just that its just cause' and her statement 'its just there is more men' implies that gender differences in participation in the computer industry are just a benign feature of

everyday life and that there is *nothing to be explained.* The effect of Amy's account is to imply that the interviewers question is somewhat meaningless.

As stated above, three of the girls drew on the idea that women may not become involved in the computing industry because they may not like working with computers. A fourth girl also constructed women's lack of involvement as a positive thing, in this case by stating that women did not need to use computers because they were 'brainier than men'. A fifth, drew on the idea that women may feel computing is 'male dominated'. However, in this account the participant implied that while older women may have felt this way, people of her age no longer did. The sixth female participant was not asked the question.

While it would be unwise to draw any conclusions on the basis of these very small differences, the pattern of responses to this question suggest that girls may strongly resist the implication that women as a group are disadvantaged in terms of their access to computing. This may be due to a desire on the part of the speakers to resist positioning themselves as a member of an underprivileged group. The idea that women's lack of involvement in the computing industry is due to their lack of interest in computers may, after all, be a more empowering account for the girls.

5.4. Summary of Chapter Five

In summary then this chapter focused on the participants' accounts of the significance of gender in the use of computers for games and work. The participants' characterised girls' and boys' preferences for computer games as polarised and along traditional gender lines. The participants also drew on the idea that boys were keener computer game players than girls. Resistance to this idea was sometimes achieved by asserting that some girls liked *other* typically male activities such as football. Thus, even in these accounts, the participants implicitly oriented to the idea that computer games were somehow inherently more suitable for boys. The participants also oriented to the idea that boys were more able with computer games than girls, and the greater ability of boys was attributed to their greater experience with games. When accounting for boys' greater interest or ability with games some of the girls drew on a negative characterisation of boys who played computer games *too* often. The boys were not evaluative about girls' preferences for computer games or about the fact that girls may play computer

games less frequently than boys. However, this may be partly due to the fact that the researcher was female.

In contrast to the extracts concerned with games, the participants generally resisted the idea that there were any gender differences in the use of computers for schoolwork. On some occasions the participants asserted that girls may be more able and interested than boys. One issue that was not addressed in the interview schedule and which may have been relevant to the issues discussed in this chapter, is the extent to which the participants may have characterised boys and girls preferences and ability with computers in school as differentiated across different computing activities. This is likely to be an interesting area for future research.

Chapter 6: Conclusions

6.1. Introduction

This Chapter attempts to draw together the main findings of this study, relate these findings to the research discussed in Chapter One and to suggest some possible directions for future enquiry. Section 6.2 will discuss the analytic observations from the three analyses Chapters on the participants' characterisations of the use of computers for work. Similarly, 6.3. will draw together the analytic observations from the participants' characterisations of the use of computers for games. Finally, 6.4. presents some concluding comments on the methodological issues raised in this study.

6.2. Computers for work

Constructing computers and computing

As discussed in Chapter Three the participants drew on a variety of different characterisations of computers across the interviews. Computers used for work were characterised as fast, efficient and sophisticated labour saving devices which were capable of complex procedures that would otherwise be time consuming or impractical. The participants also drew on a variety of negative characterisations of computers for work. One was that computers were 'slow' and therefore frustrating to use. Another was that computers were complex and difficult to understand and that this also led to frustration. The participants also drew on the idea that computers could be unreliable, and that you could suddenly, without warning, lose an important piece of work or information. A final negative characterisation was that computers were boring and mundane to use.

As was illustrated in Chapter three, the participants drew flexibly on these different characterisations of computers across different contexts of the interview. As was also discussed, such variability poses problems for questionnaire based approaches which assume that children have a fixed concept or attitude towards computers: If children draw flexibly on different (and contradictory) metaphors of computers, how are we to decide which is their true or underlying representation? By contrast, from a discourse

analysis perspective, the variable and functional nature of accounts is an important focus of interest. Rather than attempt to reveal participants true or underlying representations, one of the aims of discourse analysis is to explicate the varied accounts participants draw upon, and the functions that these different 'versions' achieve. As the remainder of this Chapter will argue, one of the main conclusions of this study was to strengthen the points made in the introduction about the limitations of the questionnaire based approach and to illustrate the utility of more contextual and qualitative perspectives.

Constructing ability with computers

Chapter Four explored how the participants characterised ability or competence with computers. Competence with computers was defined in terms of; having experience with computers; 'knowing what to do' or 'being in control' when working with computers; being able to work on ones own; and being able to help others with computing problems. The participants' references to computing skills they had acquired and the use of 'technical' or technical sounding phrases also served to position them as competent. Lack of competence with computers was characterised in terms of; not having sufficient experience with computers; not 'knowing what to do' and needing help when working with computers (either from the teacher or from other pupils). When describing themselves or others as having difficulties with computers the participants frequently drew on the idea that computers were complex and difficult to understand.

In addition to being generally good or bad at computing a third 'subject position' available to the participants was that they were 'good enough' at working with computers. The idea of being 'good enough' at computing raises some interesting issues regarding how competence with computers is defined. A future research project might explore whether this characterisation of ability is more readily drawn upon in the context of working with computers than with other school subjects. It may be the case for example, that for many pupils computing is seen as a subject in which they have to 'get by' rather than one in which they are likely to excel. A comparative analysis of children's characterisations of competence across different school subjects could reveal some interesting insights here.

In some contexts the participants descriptions of themselves as being 'good enough' at computing seemed organised to ward off the potential inference that they were the type of person that was very good at computing. One possible function of these accounts was to avoid being seen as 'boastful'. Another possibility is that the participants were keen to ward off the negative connotations of being a 'computer geek' or 'boffin'. As will be discussed later, distancing oneself from being the kind of person who is *excessively* keen on computers was particularly important when talking about playing computers games.

These points highlight some of the subtle issues that mediate the way children position themselves in relation to information technology. Computer attitude scales assume that children's relationship to computers can be assessed in terms of how positive or negative they are along various 'dimensions' (the most common dimensions used are 'anxiety', 'liking' and 'confidence'). However, such measures may obscure some of the complex and contradictory ways children position themselves in relation to IT. As discussed above, in some contexts, children may want to avoid describing themselves as being very good at computing, not because they are 'under confident' or 'unenthusiastic' about computers, but because being OK or 'good enough' at computing is a desirable identity, or because they want to avoid being positioned as a 'computer geek'.

Gender and ability with computers

As discussed in Chapter 4, the participants did not explicitly link ability with computers to gender. Furthermore, the analysis did not reveal any substantive differences between the girls and boys in terms of how they characterised their own ability or confidence with computers. However, a few points relating to the issue of gender and ability with computers did suggest some possible areas for further enquiry. One interesting theme was the participants'' accounts of 'expert pupils''. While references to expert pupils were not frequent enough to form a substantial part of the analysis, as stated in Chapter 4, it is worth noting that *none* of the references to 'expert pupils' were to girls.

The possibility that boys are more likely than girls to emerge as 'expert pupils' is in line with the observations of Eljkaer (1992). As discussed in the introduction, Eljkaer argued that the subject content of computer science is symbolically linked to

masculinity, and that consequently, boys developing gender identity is tied to their success or failure in the subject. According to Eljkaer, boys are compelled to establish their competence in the 'public sphere' of the IT classroom and so tend to dominate the computing resources and classroom discussion. Eljkaer suggests, that while girls do not feel the need to compete with boys for 'public space', they are just as confident as the boys about their ability with computers. Significantly, Eljkaer also observed that boys who tended to struggle with computer science were reluctant to seek help. This latter observation fits with the finding in this study that 'needing help' signalled lack of competence with computers.

While the evidence of this study does not allow for any firm conclusions to be drawn about the meaning of 'helping behaviour' in the IT lesson, or about the significance of 'expert pupils', the above discussion does raise some interesting areas for future enquiry. One interesting avenue would be to look at the way expert pupils emerge in the IT lesson. Possible research questions include: How do pupils come to be identified by their fellow classmates and teachers as 'experts'? How do such pupils characterise their own relationship with IT? A key area for enquiry will be to explore how gender mediates the notion of the expert pupil: Are expert pupils always boys? What about girls who do well in IT, how do they characterise their ability with computers? And how are girls who are successful in IT described by their teachers and fellow pupils? As discussed in the introduction, there is some indication that teachers are more likely to attribute the achievements of girls in computing subjects to hard work than to ability or flair (Culley, 1993). Is similar behaviour by boys and girls in the IT lesson accorded differential significance?

The research questions discussed above would be most fruitfully explored by qualitative, observational studies and by detailed analysis of video recordings of children's behaviour within the IT lesson. Such research could also explore the 'helping behaviour' of children when working with computers. As indicated above, Elkjaer's research suggests that boys are less likely than girls to seek help with computing tasks, and it would be interesting to see whether further research would confirm this finding. Do boys and girls differ in the number of times they solicit help or offer help to others? Are there qualitative differences in the ways in which girls and boys offer and respond to help? Detailed examination of behaviour of this type might go some way to elucidating the subtle ways that children's interactions with computers come to be imbued by gender.

When considering the extent to which the participants' understandings of competence with computers were mediated by gender it is perhaps also interesting to consider the themes that did not emerge in this study. One theme that we may have expected to arise was that people who were good at computing would also be good at maths or at science and technical subjects. As discussed in the introduction, some researchers have argued that one possible explanation for girls lack of enthusiasm for computers is the strong association between computing and subjects such as maths, science and technology (Culley, 1993). However, while the participants in this study frequently drew on the idea that someone who was good at computing was likely to be good at school work generally, the idea that competence with computers may be linked to ability in maths, science or technology rarely arose (only one explicit reference to this idea was identified). However, it is important to point out that although these themes were not raised explicitly in the interviews in this study this does not necessarily mean that they would not be drawn upon in other contexts.

Gender and enthusiasm for computers

As discussed in Chapter Four, the interview questions did not lend themselves to a comparative analysis of how highly the girls and boys rated their liking of computers. However, there were some differences in the kinds of computing activities that the boys and girls said they liked doing. The girls, more often than the boys, cited typing or word processing as an activity that they enjoyed; and the boys, more often than the girls, referred to computer games as an activity that they liked doing on the school computer. The boys also more frequently referred to a general feature of computing that appealed to them such as 'finding things out'. While it would be unwise to draw any firm conclusions on the basis of the very small differences observed here, these findings do suggest that there may be some differences between girls and boys, not in their overall attitude towards 'computers', but in terms of their enthusiasm for and participation in different kinds of computing activities. The extent to which gender mediates girls and boys responses to *different kinds* of computing activities is likely to be an important area for future research.

The possibility that girls and boys may respond differently to different kinds of computing activities may seem somewhat self-evident. However, it is an issue that is frequently glossed over in a great deal of research into gender differences in IT. As has

been discussed, much of the research in this area has compared girls and boys attitudes towards 'computers'. The findings of this study add weight to the argument made in the introduction, that given the wide range of computing activities children now engage in, a comparison of girls and boys responses to items about 'computers' may well be meaningless. Although the present study explored the distinction between 'computers for work' and 'computers for games', with hindsight it would have been interesting to have further explored the children's characterisations of specific computing tasks or software. An important aspect of future research in this field will be to explore gender differences in children's responses to particular computing activities.

As discussed in the introduction, there is some evidence to suggest that girls are less likely than the boys to see computers as having any personal relevance to their own lives (Makrakis, 1993), and that boys are far more likely than girls to have career aspirations in computing fields (Culley, 1993; Hattie and Fitzgerald, 1988). While the small number of participants in this study do not merit any firm conclusions, it is interesting to note that the boys and girls were, on average, equally enthusiastic about working with computers when they were older. Again, despite the small number of participants involved, it is perhaps also worth noting that of the girls who cited a specific occupation or computing activity that they may do, all three referred to word processing (the three boys who cited a specific activity they may do when they were older referred to three different tasks; 'designing', 'typing', and 'organising files'). When set alongside the differences in the girls and boys responses to the question about their liking of computers, these findings suggest that gender differences in aspirations about working with computers may manifest themselves, not in terms of whether or not the girls and boys see themselves as working with computers (most of the participants in this study thought that computers would play some role in their future), but in terms of the different kinds of computing activities girls and boys see themselves doing.

One point of contact between the findings of this study and the questionnaire based research discussed in the introduction, is that while there may be small 'average' differences between girls and boys in their attitude towards computers, on the whole, girls are both enthusiastic towards and confident about their ability with computers. These observations raise some puzzling questions about the relatively lower participation of girls in computing activities: If girls are generally positive towards computers why do they choose to opt out of formal computing subjects at school,

University and beyond? Although not explored in this thesis, a crucial area for future research will be to explore how girls account for their decision not to take up computing at these various stages of their academic and professional careers. The findings of this study suggest that one fruitful area of enquiry will be to explore how gender mediates children's responses to different kinds of computer tasks. It seems plausible that while girls are generally positive about some computing activities, computing careers and computing courses at university are still regarded as predominantly male domains.

Talking about gender and computers

Besides exploring possible differences between the girls' and boys' characterisations of their own ability and enthusiasm for computers, this thesis also explored the way in which the participants *themselves* addressed the significance of gender in computer use. As discussed in Chapter 5, in general the participants resisted the idea that there were any differences in girls and boys ability or enthusiasm for computers in school. The participants also resisted the implication in some of the interview questions that girls were somehow disadvantaged in their access to the school computers. The strong resistance to the idea that there are gender differences in the use of computers in school stands in contrast to some previous research which suggests that both boys and girls regard computing as an activity that is somehow more appropriate for boys (Wilder, Mackie and Cooper, 1985). However, the different findings of this study and the one conducted by Wilder et al (1985) may in part be due to changes over time. It seems plausible that the increasing use of computers in schools over the last decade may have helped to dissolve the very strong stereotype that the use of a computer is inappropriate for girls.

The extent to which the participants considered gender to be important in girls and boys interactions with *different kinds* of computing tasks in school was not addressed in this study and is likely to be an interesting area for further research. It seems plausible for example, that word processing may be seen as something which girls are more likely to enjoy and be good at than boys, and that 'hard core' computing activities such as programming are seen as the province of boys. Similarly, as previously mentioned, it seems likely that the significance people attribute to gender in relation to computing activities at University and beyond will also vary across different computing domains. Exploring how the significance of gender is defined and

negotiated across different computing contexts is likely to be an interesting and fruitful area for future research.

6.3. Computers for games

Characterising computer games and computer game playing

The participants' characterisations of computer games and computer game playing were lively and enthusiastic. The participants characterised computer games as very realistic and computer game playing as an activity which involves intense concentration and complete absorption in the game. The participants also characterised their interactions with computer games as frequent and as lasting for long periods of time. The participants employed these characterisations to position themselves as enthusiastic and regular computer game players. However, the participants also oriented to the idea that being *too* keen on computer games or playing them *too* often could be undesirable. In these accounts the participants drew on the negative image of the solitary computer game player who plays computer games at the expense of their involvement in other activities. By employing these characterisations the participants distanced themselves from the possible inference that they themselves played computer games to an 'unhealthy' or excessive degree.

As discussed in Chapter Four, there were no average differences between the girls and boys in terms of how highly they rated their ability with computer games (although again, the small number of participants involved in this study prevents any firm conclusions being drawn). As was also discussed, the responses to the question about the participants' *enthusiasm* for computer games did not lend themselves to a comparative analysis between the girls and boys. It is worth noting though that all but one of the girls who participated in this research described themselves as enthusiastic computer game players. Research into children's interactions with computer games suggests that boys are more regular and enthusiastic game players than girls (Griffiths, 1996; Stutz, 1996). However, while it may be the case that boys are *on average* more positive about computer games than girls, the findings of this study suggest that it would be unwise to conclude that girls are negative about computer games. A few differences did emerge in the kinds of games that the boys and girls said they liked playing. Thus (as was the case with computers used for schoolwork) in addition to

possible differences in overall enthusiasm for computer games, future research should explore differences in girls and boys responses to *different kinds* of computer games.

Chapter 5 explored how the participants themselves negotiated the significance and meaning of gender in the context of computer use. As we saw in that chapter, while the participants resisted the idea that there were any gender differences in the use of computers for school, in the context of computer games, girls and boys preferences were characterised as polarised along traditional gender lines. These accounts were often warranted by the assertion that such preferences were part of whole set of differences that permeate many aspects of everyday life. The participants also drew on the idea that boys were keener and more regular computer game players than girls. On some occasions, the participants resisted the suggestion that there were gender differences in girls and boys interactions with computer games by referring to the fact that some girls liked other typically male activities such as football. Even in these accounts then, the participants oriented to the idea that computer games are somehow more inherently appealing to boys. The participants also oriented to the idea that boys were better at playing computer games than girls, and boys greater ability with games was explained in terms of their greater experience.

As noted above, research looking at children's interactions with computer games suggests that boys are far more regular computer game players than girls. As Griffiths (1996) argues, this finding is hardly surprising given that most computer games are targeted at boys and tend to contain exclusively masculine images. While there has been a great deal of research looking at children's interactions with video arcade games there has been comparatively little research looking at the use of home computer games. In light of the increasing use of computer games in the home there is clearly a need to redress this balance (Griffiths, 1996). One important area for future research will be to explore the link between the use of computer games at home and children's behaviour with computers in school. Some writers have suggested that boys greater experience with computer games may be an important contributing factor to their relatively higher participation in school computing activities (Beynon, 1993). The distinction that the participants in this study drew between the significance of gender in a school and game context suggests that this is not reflected in the participants own understandings of computer use. However, it does seem plausible that boys interactions with computer games may make them more readily disposed to *some*

computing tasks. This possibility is also likely to prove an interesting area for further enquiry.

In general, research in the field of gender and IT could benefit from more attention to the way boys interact with computer technology. As discussed in the introduction, the implicit assumption in some research is that boys' relationship to IT represents an unproblematic ideal, and that it is girls and women who constitute the 'problem'. However, as Eljkaer argues, we need to be sensitive to the relational nature of gender: Any understanding of girls and women's relationship to computer technology must include an examination of boys and men's interactions with the subject (and vice versa). Exploring the possible benefits and disadvantages of computer games would seem to be a particularly important area of enquiry if we are concerned about understanding boys' relationship to computers.

The preceding discussion has identified a number of important areas for future research. In general, there is a need for more research into children's interactions with computer games. Exploring the links between children's use of computer games and their involvement in school computing activities may be a particularly revealing line of inquiry in understanding gender differences in response to computers. As was the case with computers used for work though, future research will have to be sensitive to the way different kinds of computer games can be differentially 'gender marked'. The discussion of computer games also emphasises the need to begin to examine boys and men's relationship to computer technology more closely and to move away from a focus solely on the behaviour of girls and women.

6.4. Concluding comments

As discussed in the introduction, the predominant approach to understanding gender differences in response to IT has been to employ questionnaire based approaches. The main conclusion of this body of research has been that while girls are generally positive towards computers, they are 'on average' less positive than boys. In contrast, the findings of this study suggest that gender is likely to influence children's responses to computers in terms of their enthusiasm for and participation in different kinds of computing activities. In light of these findings the questionnaire-based approach which compares children's attitudes towards 'computers' would seem to be somewhat obsolete. One way of solving this problem would be to develop questionnaire-based

methods that differentiate between different computing activities. However, while such an approach is likely to be useful, it will not in itself provide a full understanding of the way gender mediates children's responses to different computing tasks. The findings of this research strengthen the argument made in the introduction that there is a need for more qualitative and contextual studies of gender issues in the use of information technology.

This study has highlighted the way the significance of gender may vary across different kinds of computing activities. Another closely related issue is the extent to which gender differences may vary depending on the particular context within which a given task is encountered. As discussed in the introduction, to date, most research within this field has tended to focus on the use of computers within 'Information Technology' or 'computer studies' options. Similarly, the interviews in this study took place within IT lesson time. However, as was pointed out in Chapter One, computers are now used across the curriculum and it is important that researchers begin to consider the possible effects of this trend on gender differences in response to computers. In addition to exploring how gender differences vary in response to *different kinds* of computing activities future research should explore the closely related issue of how the particular *contexts* within which computing tasks are encountered may also mediate the potential significance of gender (cf. Light et al, 1999).

The present study adopted a discursive perspective to address the question of gender differences in children's responses to computers. One of the strengths of this approach is in its attention to the way the participants themselves characterised their interactions with computer technology. This approach has led to several interesting insights that may otherwise have been glossed over in more traditional questionnaire based studies. One possible disadvantage of discourse analysis however, is that it does not lend itself easily to large-scale comparisons between different groups. Researchers interested in gender differences in response to IT will want to keep track of large scale trends in girls and boys responses to computers, and questionnaire based methodologies are likely to continue to be useful in this respect.

These points suggest that research in the field of gender and IT is most likely to gain from a combination of qualitative and quantitative perspectives. However, it is important to bear in mind the contrasting theoretical assumptions that underpin these different perspectives. As authors in the field point out, discourse analysis is not

simply another methodology that can be employed to address the traditional concerns of psychology. Instead, discourse analysts have argued for a radical re-conceptualisation of some of the most fundamental notions in the discipline. For example, through their attention to the variable and context dependent nature of self presentation, discourse analysts have argued that the assumption that we can discover participants 'true' or underlying representations of objects and events in the real world is problematic (Potter and Wetherell, 1987). A full consideration of the implications of this debate is well beyond the scope of this thesis. The point to note here is that when we try to combine qualitative and quantitative perspectives a number of theoretical tensions arise. Research in the field of gender and IT is most likely to benefit then, not only from combination of qualitative and quantitative perspectives, but also from a consideration of the theoretical issues that such a position raises for the way we understand children's relationship to computer technology.

Appendix A: Interview Schedule and Scrapbook

The interview schedule is presented below. As far as possible the participants were asked all of the main questions. The follow up questions (in italics) were employed flexibly depending on the participants initial response to the question. A photocopy of the scrapbook is included in pages 106-117. The scrapbook was size A3 and the images were of a better quality than the ones presented here. Where a question referred to a scrapbook image the page number of the image is indicated in the schedule.

Interview schedule

As you know I'm interested in finding out what children your age think about computers, and what I'd like to do today is have a *discussion* about what you think about computers. You have already answered some written questions for me, so today you have a chance to tell me what you think about computers in a little more detail. Is that OK ?

OK. Well, I've got a few questions here relating to what you use computers for and how much you enjoy using them, and we can base our discussion around these. However, we don't have to stick to these questions, they are really just a guide to our discussion, so if there is something you think is important about computers or your experience with them that isn't covered by these questions, then please bring it up.

OK, first of all I'd like to talk to you about the computers you use in school and what you use them for, and later on I'd like to ask you about game computers and any other computers you may have used. OK ?

Computers in the classroom

1. So what sort of things do you use the school computer for ?
   Are there any other lessons where you use computers ?
   Is there anything else you have used the school computers for that you haven't mentioned ?

Enjoyment

2. What kinds of things do you *like* doing on the school computer ?

   Why do you like ..... ?

   What is it about ....(the activities they mention)... that you like ?

   (Refer to the activities that they mentioned in QU.1.)

3. Is there anything you dislike about using the computers for schoolwork ?

   What kinds of things do you dislike doing on the school computer ?

   Why do you dislike .....?

   What is it about... (that particular activity).. that you don't like ?

Ability

4. Would you say you were good at working with computers ?

   Why do you think you are good at computer work ?

   Why don't you think you are good at computer work ?

   What sort of computer work do you think you are good at ?

   Is there anything you are not so good at ?

5. Would you say that you were better at working with the computer, or at other types of schoolwork ?

   Why ?

6. Would you like to be better at working with computers ?

   Why ?/ Why not ?

   How good would you like to be ?

Confidence/Difficulties

7. Are you confident about using computers ?

   What gives you that confidence ?

   Where do you get that confidence from ?

   Why are you confident ?

   Why aren't you confident? What is it that puts you off ?

8. Do you find working with computers easy or difficult ?

What kinds of things are easy on the computer?

What is it about.... (that particular activity).... that is easy ?

What kinds of things are difficult ?

What is it about.....(that particular activity)....that is difficult ?

9. What sort of person is good at working with computers ?

What sort of people like working with computers do you think ?

Computers in education - broader issues

10. OK. Now I've got some pictures here I'd like you to look at (Scrapbook pp. 106-107) . These photographs show children working with computers in school. How important do you think it is for children to learn about computers in school ?

Why is it important do you think ?/Why don't you think it's important ?

What sort of things should children be taught about computers ?

Would you like to learn more about computers ? Why ?

What sort of things would you like to learn ?

Computers in the workplace

11. These are some pictures of people using computers in the work place (Scrapbook pp. 108-109). Do you think computers are important in the workplace ?

Why are they (so) important ? Why are they not important ?

What sort of things are they used for do you think ?

12. Would you like to work with computers when you are older ?

Why/Why not ?

What sort of computer work could you see yourself doing ?

13. Does anything put you off working with computers ?

OR. - Are there any disadvantages or negative aspects to working with computers ?

Computers at home/ Computer games

14. Is there a computer at home ?

IF YES : *Whose is it ?*
What kind of computer is it ?
What do you use it for ?

IF NO : *Don't worry, lots of people don't have one . Do you ever play or use your friends computers ? What do you use it for ?*

If they mention a desktop computer ask them if they ever use it for schoolwork (if they find it helpful and so on), before moving onto games questions.
If they only mention a 'game' computer (i.e. Nintendo, Sega) go directly to question 15.

15. Do you ever play computer games, on your own or a friends computer ?
Do you like playing computer games ?
IF 'YES ' :*Why do you like computer games ?*
What is it that is so good about computer games ?
What sort of games do you like ?
Do you have a favourite game ?
Why do you like that particular game so much ?
IF 'NO' : *Why don't you like computer games?*
What is it that you don't like about computer games ?

16. Would you say you were good at playing computer games ?
Why are you good ?/Why are you not so good ?
Would you like to be better at playing computer games ?
Why ?
What sort of person is really good at playing computer games ?

17. What's the difference between using computers for games and using them for work ?
Which would you say you were better at ? Why ?
Which do you prefer ? Why ?

18. A. OK lets have a look at the scrapbook again. Can you read this headline out for me ? ("Teenagers feel need to steal for a game" Scrapbook p.110). Do you think that's true ? Do you think that some teenagers feel they have to steal computer games?

Why do you think that is ?

Why do you think it is so important to them ?

18.B. The article says that part of the reason is that some teenagers are addicted to computer games. Do you think that's true ? Do you think computer games are addictive ?

What is it about computer games that makes them addictive ?

Do you think you play computer games too often or to little ?

Gender and games

19.A. Can you read out this headline? (Scrapbook p. 111, 'Video love games target teenage girls'). The article says that most of the games in the shops are designed with boys in mind and are not interesting to girls. It says that some companies are trying to design games that are more appealing to girls. Do you think that computer games are suitable for both boys and girls ?

Why do you say that ?

What sort of games appeal to boys ?

What sort of games appeal to girls ?

19.B. What about this advertisement (Scrapbook p. 112. 'ThunderHawk') . Have you heard of this game do you think it would appeal more to girls or more to boys. Why ?

20. Are girls and boys equally good at playing computer games ?

Are they equally interested ?

Why ?

Gender and schoolwork/workplace

21. What about using computers in school. Do you think girls and boys are equally good at using computers for schoolwork ?

Do you think they are equally interested ?

When you think of a boy who is really good with computers what sort of person do you think of ?
When you think of a girl who is really good with computers what sort of person do you think of ?
Do you think there are any differences between girls and boys when it comes t to computers ?

22. This article (Scrapbook p.113, Computers are not a girls best friend', was written about ten years ago and it says that girls aren't as interested in computers as boys. Do you think that's true ?

Why is that do you think ?

23. Can you read this headline for me ? (Scrapbook p.114. 'Boys muscle in on the keyboard'). The article says that boys tend to dominate the computers in schools and girls don't get as much of a chance to use them. Do you think that's true ?

Does it ever happen in your classroom , when you are working with computers ?

24. OK. What about this one (Scrapbook p.115, 'HI-tech calls on women to plug skills gap'). This one says that computer companies can't get enough women to come and work for them. Why do you think not many women go into the computer industry ?

25. This article says that boys aren't doing as well as girls at school (Scrapbook p.116. 'The trouble with boys'. Do you think that's true?).

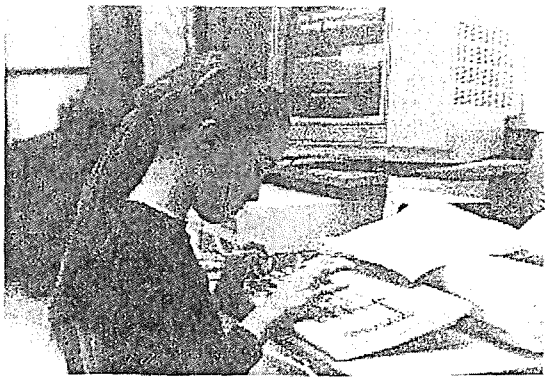
The article says that part of the reason is that boys don't want their friends to think they are 'square'. Do you think boys are concerned about that sort of thing more than girls ?

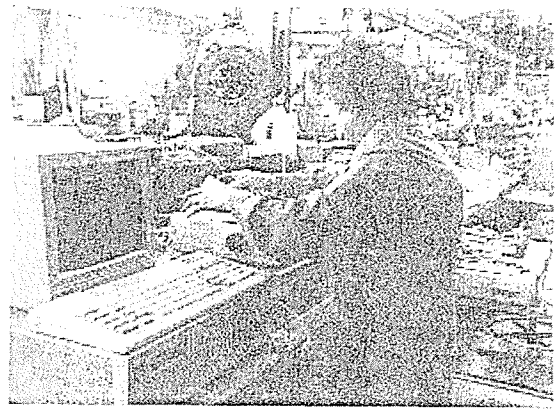
26. This article (Scrapbook p.117 'Technology lessons will fight gender stereotypes') on the other hand says that because everyone has to do computer technology now, girls and boys will be equally happy using computers, and will be equally likely to go into computing careers. Do you think that's true? Do you think the same number of boys and girls will get jobs working with computers?

27. Is there anything we haven't covered in our discussion that you think is important about your experience with computers? Is there anything you would like to ask me?

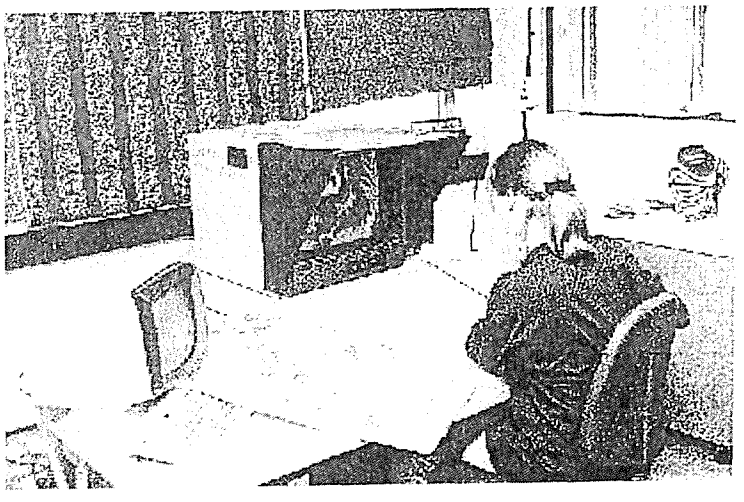
MICHAEL POWELL

Jane Mitra and her pupils who have won an award for their multimedia program





Photograph: University of Southampton



KATZ PICTURES

Teen spirit: consumer goods have become youngsters' main source of a sense of identity and community

Teenagers feel need to steal for a game

Twenty-five per cent of teenagers would be prepared to steal a computer game if they could not afford it, according to a study to be presented at the BSA conference.

Just over a quarter of the teenagers said that they found it difficult to stop playing the games.

The study, conducted by Ken Parsons, senior lecturer in sociology at Manchester Metropolitan University, involved interviews with 61 teenagers in a youth club and further education college in Crewe and Dundee.

The youth club did not have any computers, so Dr Parsons avoided the trap of interviewing only the most dedicated players, as would be the case in games halls. Nevertheless, he found that 70 per cent of the study group owned their own computers, and not one of the remaining 30 per cent said that they did not want to own one. "I was surprised because the teenagers in this cohort were not affluent — most of their parents were in low-income jobs," he says.

Dr Parsons's study, which also involved a review of existing research, outlines three areas of concern around computer games.

First, they take children away from outdoor sports and could therefore have a bad effect on their health and are addictive. Some 90,000 youngsters a year seek help for addictions to gambling, and the games pose a new snare.

Second, they are expensive and at about £40 a time many parents feel it is impossible to satisfy their children's demands. Dr Parsons found that a quarter of the teenagers in the study would steal to overcome this problem.

Third, the games can be viewed as racist, sexist and classist. Dr Parsons found that although 92 per cent of the females said they enjoyed the more whimsical, less aggressive games, and their preferred character was Sonic the Hedgehog, 82 per cent of the 35 males he talked to enjoyed the violence and aggression in most games. Their favourite games included *Mortal Combat* and *Heavyweight Champ*.

"I am not advocating that such games be banned," he says. "But parents and those involved in working with young people need to be more alive to the dangers they pose."

Video love games target teenage girls

Kevin Rafferty in Tokyo and Jonathan Confino

JAPANESE-based Sega and American computer giant Microsoft yesterday announced plans to develop a powerful new generation of video games that will supplement the current diet of violence and action with love and soap operas.

The companies hope their 32-bit machine, which will be twice as powerful as Sega's current range, will attract teenage girls who have been put off by the brutality of the existing games such as Mortal Kombat in which the conquering hero draws realistic blood and guts.

The product, which should be available in Britain by Easter 1995 and is likely to cost around £400, will be able to use movie-quality games that use real actors.

Games that continue to use cartoon characters, such as Sonic the Hedgehog, will be greatly enhanced by being able to show detailed expressions and emotions. The product will be able to show more colours on the screen and sound quality will be greatly improved.

Nick Alexander, chief executive of Sega Europe, said: "At the moment, the games are male orientated. Girls, particularly post-pubescent girls, are more interested in relationships and emotions than shooting and action.

"The new system certainly should be able to open up this market and could have things like interactive soap operas where the player can choose the direction of the plot."

But the new technology will also have the ability to make games involving violence much more realistic and blur the lines between fantasy and reality.

In an attempt to head off criticism, Sega and other companies are working towards a voluntary classification system for different age groups.

The tie-up between Sega and Microsoft represents an intensification of the battle for dominance in the £9 billion video games market.

Apart from Sega's main rival Nintendo, several other companies such as Sony have already announced plans to produce similar products. The race is now on to see who can bring them first to market.

Mr Alexander said: "The market is moving forward very rapidly and everyone is busting a gut to develop new products."

While Mr Alexander concedes that a new company 3DO, a joint venture between Matsushita, Time-Warner and AT&T, may be the first to bring a 32-bit machine to the European market, he expects the Sega rival to undercut it in terms of price.

News of the tie-up with Microsoft, America's most profitable computer firm, pushed Sega's shares up 3.5 per cent in Tokyo

Shoichi Nakamura, managing director of Sega, praised Microsoft's "great know-how and achievements, especially in operating systems".

Guardian
18/1/94

THUNDERHAWK

FIRESTORM
THUNDERHAWK 2

What we have here is the definitive Mega-CD game... The yardstick by which all others will be measuredd

GAMESMASTER 94%

If you've got a Mega-CD you have two choices: buy Thunderhawk or sell the Mega-CD.

SEGA ZONE 92%

Thunderhawk's an action-packed, in-yer-face flight sim that's more fun than any game has a right to be.

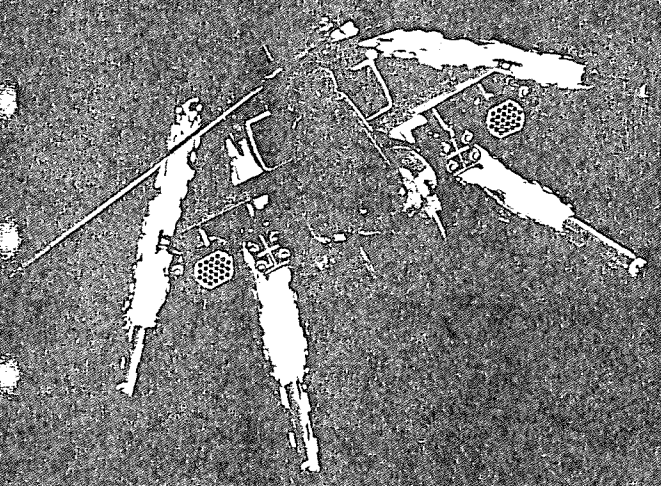
MEGA 91%

It puts anything else on the Mega-CD to shame... A standard by which all future Mega-CD games will be judgedd

SEGA FORCE MEGA 92%

This is the game you simply must play... This is the game that will embarrass the hell out of the other CD-developers.

SEGA POWER 91%



GET READY FOR THIS...

LOCATE, INTERCEPT & DESTROY

PC CD-ROM, SEGA SATURN & SONY PLAYSTATION

CORE DESIGN LIMITED 55 ASHBOURNE ROAD DERBY DE22 3FS TEL: 01332 297797 FAX: 01332 381511

Computers are not a girl's best friend

By Bill Johnstone
Electronics Correspondent

Girls in senior schools are being left far behind in learning how to use computers, a survey shows.

Three commmon reasons are lack of female computer teachers, parents who give home computers to their sons rather than daughters, and the presence of boys in class who tend to hog the school compters.

The conclusions are the result of a survey in 20 English primary and secondary schools to determine why such a low proportion of girl pupils want to use computers.

The study was conducted by Acorn Computers, of Cambridge, maker of the BBC Microcomputer that accounts for 85 per cent of school computers.

The Acorn study shows that there is no sex bias in primary or junior schools where as many girls as boys participate in computer courses and exhibit as much talent.

But in grammar and secondary schools, the deficiency of female teachers and the encouragement given to boys has meant that girls are lagging behind. The report states: "Girls in girl-only schools are doing much better in computer studies than their mixed-school counterparts. It seems that without the boys to hog their computers, girls are more willing to overcome their prejudices against computers."

However, the report concludes that parents are equally to blame: "Our worry is that Britain is in danger of losing half its talent if girls do not acquire vital computer skills.

"It is clear that much of the problem is due to parents giving home computers to their sons rather than their daughters. This 'leg-up' to the boys could mean that girls will not be able to compete with their more knowledgeable brothers at school."

Boys muscle in on the keyboard

A computer in every school has proved a mixed blessing. Girls seem to be missing out on the new technology, which has slotted straight into a male-dominated hierarchy of maths teaching

Mary Gribbin

MICROCOMPUTERS are promoted as the saviour of the nation. Both girls and boys, we are told, are provided with new hope for work by this new technology, and last Christmas the home computer was the present for the kids that walked off the shelves. The message hammered home by advertising was that a home computer was essential for children to keep up with what they were learning at school, and for parents to catch up on what they had missed. It clearly got through, with the implication that when it came to getting a job, with 4 million unemployed, that school leavers who knew the difference between a bit and a byte would have a head start. Even though a micro system could set parents back by hundreds of pounds, and shortage of the most popular models caused a frantic search for alternatives (often more expensive and less suitable), the micro was, indeed, the present that little Johnny got for Christmas 1983, and sales continue to boom.

But what of little Jill? There is a growing weight of evidence that girls are missing out on computer education, for all the reasons that they miss out on science education in general. And parents worried enough about a son's job prospects to fork out hundreds of pounds for a micro in a desperate attempt to help generally seem less determined to promote the job prospects of their daughters.

Girls have to fight to get their hands on computers in most homes and schools. Male teachers and pupils make micros seem "out of bounds"

The problem was brought home to me by the experience of children in a class of 9-10 years olds that I was teaching. All but one of the 26 children in the class said before Christmas that they would like a micro. Most of the children in the school came from fairly affluent homes, and 13 of the 26 children had their wish granted. Twelve of the chosen 13 were boys. Five of the girls who wanted a micro but didn't get one said that their brothers (not necessarily older brothers) had got one for Christmas, and that "sometimes he lets me have a go". And all of the children who did have micros—the few girls as well as the male majority—were taught how to use it by Dad. None of them ever mentioned Mum using it at all—which rather gives the lie to one current TV ad which shows Mum and Dad happily playing with the new toy while little Johnny looks on. Typically, I was told by my pupils, Dad "helps" the children with the computer in the early evening "while Mum is cooking the dinner", or at weekends "when Mum is clearing up the house". At the age of nine, children in our society are conditioned to accept that boys and men are the proper users of a computer, that girls might be allowed an occasional touch of the keyboard, and that a woman's job is to feed and care for the men.

I thought that this might be a purely local phenomenon, and certainly would not have dreamed of drawing far reaching conclusions about the state of the nation from such a casual and limited "survey". But now the London Borough of Croydon has produced a report for the Equal Opportunities Commission (EOC) on *Information Technology in Schools*. These "guidelines of good practice for teachers of

OBSERVER SUNDAY 25 MARCH 1990

Hi-tech calls on women to plug skills gap

Women could hold the key to the future of the information technology industry. **Julian Ayer** reports.

THE INFORMATION technology industry is faced not only with the problem of ever fiercer competition for skills, it has also been forced to recognise that it is failing to attract *women into its workforce* — at a time when women are seen as the answer to the nation's labour market problems.

The Women in Information Technology Foundation (WITF) has been formed to offset this trend and to campaign to boost the proportion of women to men in IT.

To those who appreciate the *significance of an effective computer-based information technology industry to the economic* health of Britain, the current acute shortfall of computer staff is dire. The statistics of gloom are unexpected.

By the mid-Nineties, according to the PA Consulting Group report, *Human Resource Issues in Information Technology*, there will be a demand for 200,000 graduates a year in the IT sector, *but supply will stand at* only 135,000. Last year, 12 per cent of graduate vacancies in IT departments remained unfilled. Even so, graduates supplied only 20 per cent of the trained manpower needed. The rest were trained by the industry itself, but this source cannot provide long-term relief.

The National Computing Centre estimates that in five years' time the overall shortage of IT personnel in the UK will be 500,000, but after that the outlook could be even bleaker.

A study of the intake into computer science degree courses has revealed that the proportion of women dropped from 25 per cent in 1988 to less than 15 per cent in 1988, at a time when the number of females *entering higher education* and the workforce in general has been rising. This suggests that the information technology industry is not projecting an image that finds feminine favour.

Studies have revealed that information research technology is generally perceived as offering desk-bound jobs that mean *staring into a screen and that are* best suited to a 'techie' obsessed with the intricacies of electronic science.

IT is not, though, being fostered as the mainstream business it is in most university teaching, but rather as a theoretical computer science. So a graduate *from a practical* sandwich degree course from Thames or North Staffs Polytechnic is paid £4,000 a year more than one who holds a Cambridge University computer science degree. The latter lacks the business nous needed by the user.

The Post Office is a good example of an organisation concerned about the retention of *female IT staff. It has begun* major computerisation of 10,000 *High Street post offices*. The Post Office's IT staff have more than tripled from 300 in the Eighties, to a current 1,100. But to head off any weakening of its IT capability through the poaching efforts of companies desperate to make up for their own IT shortfall, the Post Office has turned to the Women in Information Technology Foundation *and its fund-raising consultant*, Philip Virgo.

To boost the ratio of women to men in the IT workforce, companies such as IBM are investing heavily in programmes to attract back women who have left the industry to have children. They claim a 70-75 per *cent success rate*.

ICL has invested aggressively and hopes to recruit 80 per cent of its former female employees. It has installed complex data transmission equipment in employees' houses as one way of escaping the IT skills shortage.

The FI Group is investing in neighbourhood computer centres, *rather than putting equipment* in homes, on the principle *that mothers are attracted back* to work by the desire to leave the house.

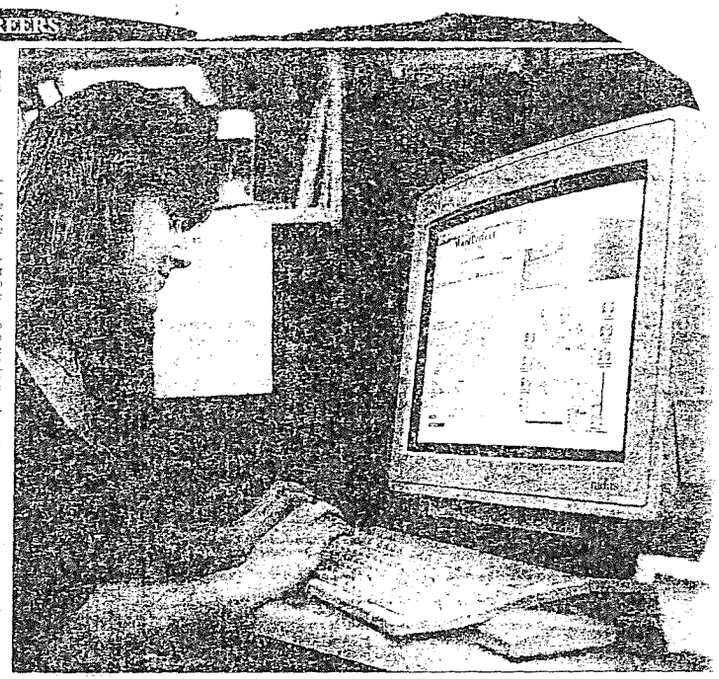
The WITF is monitoring differences of this kind so that it can promote the campaign to recruit more women into the *British IT industry*.

Those, like Philip Virgo, who liken the struggle to build up the British IT workforce to the second Battle of Britain, point to the recruitment activities of other EC countries, notably the *Germans*.

There is no more talk of blaming our skills shortage on the United States and the brain drain. Instead, the dreaded name of Siemens is muttered wherever two IT personnel specialists meet.

German companies have been seen this year actively pursuing the brightest British IT graduates at milk round presentations up and down the country. The cream of the male IT graduate workforce is being lured to Germany with exciting offers of a prosperous life in the EC.

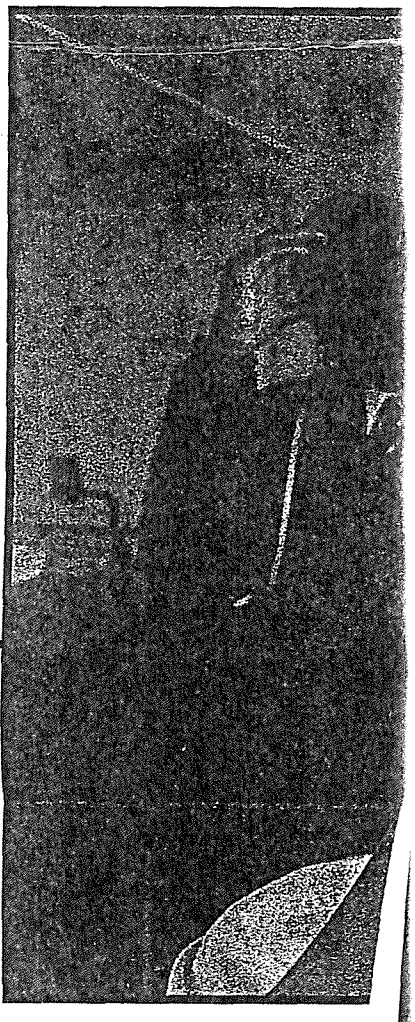
Further along the age-scale, however, it is women with families who are less open to such blandishments and more likely to be a source of stable and skilled staff.



Old girl network: Women are likely to solve the computer industry's skills problem./Photograph by Dod Miller.

Licker, geek, swot and boff. The words that make boys try less hard at school. By **Hilary Wilce**

The trouble with boys



When an Essex comprehensive set out to tackle its poor exam results a few years ago, it discovered an anti-work culture so strong among the boys that even carrying a book could be social death.

"Some took so much pride in never being seen with a book they had virtual slaves to carry their books to and from school for them," says John Cooper, the head of Nicholas School, Basildon. "The worst thing you could be was a 'boff' or an 'anorak'."

Schools have been battling for decades to boost the confidence and achievements of their girl pupils. Now their very success has thrown up a second gender challenge – boys. Because while girls are doing better and better in school, boys are struggling to stay put, and the gap between the sexes is widening steadily.

Boys now do less well at every level of GCSE than girls, and less well in English from the age of seven onwards. They are less conscientious about homework, less organised about bringing the right books to class, more likely to get in to trouble with their teachers, and four times as likely to be excluded from school. Out of school, they read fewer books than girls and spend more time watching television and videos.

> 'You're duty bound to be like your friends. You feel you'll be laughed at if you're not'

The good news is that schools that recognise these problems can do much to keep boys motivated and on track. Nicholas School, which has introduced a programme of mentoring, after-school classes and residential courses, has seen the boys' achievements rise steadily, from 86 per cent getting one or more GCSE passes in 1994 to 96 per cent two years later.

For some critics the current anxiety about boys' achievements is only a negative reaction to girls' success. Boys, they point out, still show more confidence with design and technology than girls, still achieve more high-grade A-levels, and are holding their own in National Curriculum tests in maths and science.

But researchers say these differences are unlikely to hold. Girls are already advancing on the boys' strongholds of maths, science and technology, and the general achievement gap at every level is growing.

"Boys arrive at school less well prepared for learning than girls, and it goes on from there," says Ralph Tabberer of the National Foundation for Educational Research. "I think most people now accept that that's the general picture."

Many reasons are given. Boys are less good at language-based learning than girls, less articulate, and less socialised – all of which hamper primary-school learning. At secondary level, they mature later, have a natural aggression that makes them less willing to accept authority, and are more likely to be criticised and undermined by their teachers. And in today's service economy, while many girls can look forward to good jobs in offices, banks and retailing, boys are far less sure what the future holds for them, or whether it's worth making any effort on its account.

But go into schools and ask young teenage boys – the age at which attitudes to school can decline sharply – why they are being outstripped by girls and their answer is far more simple: it's their friends.

At Homewood School and Sixth Form College, Tenterden, a flourishing Kent comprehensive, pupils are matter-of-fact about this and its consequences.

"Friends are what matter in the end," says 14-year-old Simon Eels. "If you say you're going to the library to get some work done, or something, and they go, 'What you want to bother with that for?', you don't go."

"You're duty bound to be like your friends," says Chris Hayward, 13. "You feel you'll be laughed at if you're not."

"I know I'm going downhill this year," says Andy Lowe, 14, philosophically. "I know I'm in with the wrong group. I think I've got the power to hold out against them – I hope I have, because I don't want to go like them – but I'm definitely going the wrong way at the moment."

All these boys know "for a fact" they could do better if they wanted to, but work is not a priority.

"It's not that girls are more intelligent than us," says Chris Hayward. "It's just that they can put their minds to things better than we can."

The school's assessment co-ordinator, Mike Denning, agrees and says the school is looking at ways of targetir students performing below ability – many of whom will boys.

"It's a question of self-motivation," he says. "Boys t to be less committed, less conscientious than the girls. They seem to have this belief in an innate intelligence which will somehow get them by."

But traditional female diligence – hours spent on homework, and hands up in class – is now being reinforced by such powerful new levels of confidence boys in co-ed schools are complaining they can't get word in edgeways in classroom discussions. In respo some schools are experimenting with boys-only Engl classes, while parents are beginning to look with nev interest at single-sex schools for their sons.

"Girls are definitely more articulate than boys, particularly about how they feel about things," says Braggins, head teacher of the Skinners' School, a b grammar school in Tunbridge Wells.

"We had Jonathan Miller here to talk to our sixt boys, and we invited the girls' grammar school to t part, and I have to say it was the girls who asked al questions."

The Skinners' School is a high-flying environme soars in the exam league tables, but even here the work hard to make sure that they aren't seen to be hard.

"Licker," says Jonathon Angel, 13. "That's what y get called if you have your hand up all the time. Licke swot ... "

Technology lessons 'will fight gender stereotypes'

TECHNOLOGY lessons for all children from age five will combat "gender stereotyping" which prevents girls taking up computing careers, John MacGregor, the Secretary of State for Education, said yesterday, **writes Mary Braid.**

He said one aim of the national curriculum was to counteract entrenched attitudes at home and school which held girls back.

He told a computing conference at University of East Anglia that only a fifth of programmers and analysts were women – a figure which had remained constant since 1981. There was little sign of improvement in the number of girls taking computing courses at school or in higher education. Only polytechnics and colleges attracting increasing numbers of mature female students were enjoying an upturn.

His hope that compulsory technology teaching would make a "substantial or crucial effect" follows warnings from the Labour Party and school advisers about shortages of technology teachers and classroom computers.

It is estimated that there will be a 6,000 shortfall in technology teachers by 1995. This will particularly harm primary schools where it is believed gender stereotying can be tackled most effectively.

Labour says the shortages threaten the introduction of technology into schools this September, while the National Association of Advisers in Computer Education has warned there are not enough computers in schools.

Mr MacGregor said computing companies should open links with local colleges and schools to boost female recruitment.

REFERENCES

Artis, J. (1994). Social Class Identity: A Discourse Analysis Approach. Unpublished undergraduate MA dissertation, University of Edinburgh.

Austin, J. (1962). How to do things with words. London: Oxford University Press.

Bar-Hillel, Y. (1954). Indexical Expressions. Mind, 63, 359-79.

Barnes, B., & Law, J. (1976). Whatever Should be Done with Indexical Expressions? Theory and Society, 3(223-37).

Beynon, J. (1993). Computers, Dominant Boys and Invisible Girls: Or Hannah it's not a toaster it's a computer! In J. Beynon & H. Mackay (Eds.), Computers into Classrooms: More Questions Than Answers . London: The Falmer Press.

Brownell, G. (1993). Macintosh Clip Art: Are Females and Minorities Represented. Journal of Research on Computing in Education, 26(1), 116-122.

Buckley, P., & Smith, B. (1991). Opting out of technology: A study of girls' GCSE choices. In G. Lovegrove & B. Segal (Eds.), Women into computing: Selected papers 1988-1990 (pp. 80-86). London: Springer-Verlag.

Chen, M. (1986). Gender and computers: The beneficial effects of experience on attitudes. Journal of Educational Computing Research, 2(265-282).

Crook, C. (1994). Computers and the Collaborative Experience of Learning. London: Routledge.

Culley, L. (1988). Girls, Boys and Computers. Educational Studies, 14(1), 3-8.

Culley, L. (1993). Gender equity and computing in secondary schools: Issues and strategies for teachers. In J. Beynon & H. Mackay (Eds.), Computers into Classrooms: More Questions than Answers . London: Falmer Press.

Eastman, S. T., & Krendel, K. (1987). Computers and gender: Differential effects of electronic search on students' achievement and attitudes. Journal of Research and Development in Education, 20(3), 41-48.

Edwards, D., & Potter, J. (1992). Discursive Psychology. London: Sage.

Elkjaer, B. (1992). Girls and Information Technology in Denmark: An account of a socially constructed problem. Gender and Education, 4(1/2), 25-40.

Garfinkel, H. (1967). Studies in Ethnomethodology. Englewood Cliffs: Prentice Hall.

Gilbert, G. N., & Mulkay, M. (1984). Opening Pandora's Box: A Sociological Analysis of Scientists' Discourse. Cambridge: Cambridge University Press.

Gill, R. (1993). Justifying injustice: broadcasters' accounts of inequality in radio. In E. Burman & I. Parker (Eds.), Discourse Analytic Research: Repertoires and Readings of Texts in Action. London: Routledge.

Gill, R. (1996). Discourse analysis: Methodological aspects. In J. E. Richardson (Ed.), Handbook of Qualitative Research Methods for Psychology and the Social Sciences. Leicester: British Psychological Society.

Goffman, E. (1961). Asylums. Harmondsworth: Penguin.

Griffiths, M. (1996). Computer game playing in children and adolescents: A review of the literature. In T. Gill (Ed.), Electronic Children: How children are responding to the information revolution (pp. pp. 41-58). London: National Children's Bureau.

Hattie, J., & Fitzgerald, D. (1988). Sex differences in attitudes, achievement and use of computers. Australian Journal of Education, 31(1), 3-26.

Hess, R. D., & Miura, I. T. (1985). Gender differences in enrollment in computer camps and classes. Sex Roles, 13(3/4), 193-203.

Hoyles, C. (Ed.). (1988). Girls and Computers. London, University of London, Institute of Education, Bedford Way Papers, No. 34.

Hughes, M., Brackenridge, A., & Macleod, H. (1987). Children's ideas about computers. In J. Rutkowska & C. Crook (Eds.), Computers, Cognition and Development (pp. 9-34). London: Wiley.

Kay, R. (1992a). An analysis of methods used to examine gender differences in computer-related behaviour. Journal of Educational Computing Research, 8(3), 277-290.

Kay, R. H. (1992b). Understanding gender differences in computer attitudes, aptitude, and use: An invitation to build theory. Journal of Research on Computing in Education, 25(2), 159-171.

Kiesler, S., Sproull, L., & Eccles, S. (1985). Pool Halls, Chips, and War Games: Women In The Culture of Computing. Psychology of Women Quarterly, 9, 451-462.

Littleton, K., Ashman, H., Light, P., Artis, J., Roberts, T., & Oosterwegel, A. (1999). Gender, Task Contexts, and Children's Performance on a Computer-based task. European Journal of Psychology of Education. *forthcoming*

Littleton, K., Light, P., Joiner, R., Messer, D., & Barnes, P. (1994). Gender and software interactions in children's computer-based problem solving (Technical Report 17): ESRC Centre for Research in Development, Instruction and Training, University of Nottingham.

Littleton, K., Oosterwegel, A., Roberts, T., & Light, P. (1998). Computers in technology education: Gender agendas Report to The Nuffield Foundation.

Littleton, K. S. (1994). Girls and Information Technology. In P. F. Murphy & C. V. Gipps (Eds.), Equity in the Classroom: Towards Effective Pedagogy for Girls and Boys. London: The Falmer Press.

Lovegrove, G., & Hall, W. (1991). Where are the girls now? In G. Lovegrove & B. Segal (Eds.), Women into computing: selected papers 1988-1990 (pp. 33-43). London: Springer-Verlag.

Makrakis, V. (1993). Gender and Computing In Schools In Japan: The "We can, I can't" Paradox. Computers and Education, 20(2), 191-198.

Marshall, H., & Wetherell, M. (1989). Talking About Career and Gendner Identities: A discourse Analysis Perspective. In S. Skevington & D. Baker (Eds.), The Social Identity of Women. London: Sage.

Martin, R. (1991). School children's attitudes towards computers as a function of gender, course subjects and availabilty of home computers. Journal of Computer Assisted Learning, 7, 187-194.

Parker, I. (1990). Discourse: definitions and contradictions. Philisophical Psychology, 3(2), 189-204.

Parker, I. (1992). Discourse Dynamics: Critical Analysis for Social and Individual Psychology. London: Routledge.

Parker, I., Potter, J., Wetherell, M., Abrams, D., & Hogg, M. (1990). Discourse in Social Psychology. Philisophical Psychology, 3(2), 187-225.

Potter, J., & Wetherell, M. (1987). Discourse and Social Psychology: Beyond attitudes and behaviuor. London: Sage.

Rosen, L. R., & Maguire, P. (1990). Myths and realities of computer phobia: A meta-analysis. Anxiety Research, 3, 175-191.

Straker, A. (1986). Should Mary have a little computer? In L. Burton (Ed.), Girls into maths can go (pp. 149-152). London: Holt, Rinehart and Winston.

Stutz, E. (1996). Is electronic entertainment hindering children's play and social development? In T. Gill (Ed.), Electronic Children: How children are responding to the information revolution (pp. pp. 59-70). London: National Children's Bureau.

Sutton, R. E. (1991). Equity and Conputers in the Schools: A Decade of Research. Review of Educational Research, 61(4), 475-503.

Todman, J., & Dick, G. (1993). Primary children and teachers' attitudes to computers. Computers Educ., 20(2), 199-203.

Turkle, S. (1984). The Second Self: Computers and the Human Spirit. London: Granada.

Volman, M., Eck, E. V., & Dam, G. T. (1995). Girls in science and technology: The development of a discourse. Gender and Education, 7(3), 283-292.

Ware, M., & Stuck, M. (1985). Sex role messages vis a vis microcomputer use: A look at the pictures. Sex Roles, 13(3/4), 205-214.

Whitley, B. E. (1996). Gender Differences in Computer-Related Attitudes: It Depends on What You Ask. Computers in Human Behavior, 12(2), 275-289.

Whitley, B. E. (1997). Gender Differences in Computer-Related Attitudes and Behavior: A Meta Analysis. Computers in Human Behavior, 13(1), 1-22.

Widdicombe, S. (1993). Autobiography and change: rhetoric and authenticity of 'Gothic' style. In E. Burman & I. Parker (Eds.), Discourse Analytic Research: Repertoires and Readings of Texts in Action. London: Routledge.

Widdicombe, S., & Wooffitt, R. (1990). 'Being' versus 'doing' punk: on achieving authenticity as a member. Journal of Language and Social Psychology, 9(4), 257-277.

Widdicombe, S., & Woofit, R. (1995). The Language of Youth Subcultures: Social Identity in Action. Hemel Hempstead, UK: Harvester/Wheatsheaf.

Wieder, L. (1974). Telling the code. In R. Turner (Ed.), Ethnomethodology. Harmondsworth: Penguin.

Wilder, G., Mackie, D., & Cooper, J. (1985). Gender and computers: Two surveys of computer-related attitudes. Sex Roles, 13(3/4), 215-228.

Wooffitt, R. (1990). On the Analysis of Interaction: An introduction to Conversation Analysis. In P. Luff, N. Gilbert, & D. Frohlich (Eds.), Computers and Conversation . London: Academic Press Limited.