

Implications of gender differences for the development of animated characters for the study of bullying behavior

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Abstract

This paper considers the impact of gender on the design of animated agents that aim to evoke empathy and to encourage children to explore issues related to bullying. High fidelity storyboards containing bullying scenarios were presented to 80 ten year old children from two schools. Children individually completed a questionnaire that focused on amongst other things the empathic relationship between the child and the characters in the storyboard. Results indicate significant differences between the genders, with greater levels of empathy and comprehension achieved when characters are of the same gender as the child. This has considerable implications for the design of animated characters for bullying scenarios, requiring that the gender of the child is taken into account when designing animated characters and the scenarios they participate in.

Keywords: children, technology, education, victimization, virtual reality, aggressive behavior

1 Introduction

Studies have revealed that bullying behavior in schools is a widespread problem worldwide (Smith et al., 1999; Wolke & Stanford, 1999) with disturbing short and long term consequences, including depression and anxiety (Craig, 1998). A range of intervention strategies to counteract bullying problems in schools have been developed (Olweus, 1999; Wolke, Woods, Schulz, & Stanford, 2001), however, it remains unclear as to how children can be provided with strategies to cope with bullying (Eslea & Smith, 1998).

Virtual Learning Environments (VLEs) populated with animated agents offer children a safe environment where they can explore and learn through experiential activities (Moreno, Mayer, Spires, & Lester, 2001; Pertaub, Slater, & Barker, 2001). Animated characters offer a high level of engagement, through their use of expressive and emotional behaviors (Nass, Isbister, & Lee, 2001), making them intuitively applicable for exploring issues such as bullying.

We are working within VICTEC (Virtual ICT with Empathic Characters), a European funded Framework V project which aims to apply synthetic characters and emergent narrative to Personal and Social Health Education (PSHE) for children aged 8-12 through using 3D self-animating characters to create improvised dramas in a virtual school. FearNot, the application being developed within this project provides a school-based VLE populated by animated agents representing the various characters in a bullying scenario. The iterative design approach used in this project makes considerable use of prototyping techniques, to allow investigation that guides design decisions for FearNot. A high fidelity prototype was used for the experimentation reported here.

A key issue for the project is the empathy felt by children for the animated agents. Our focus is to determine how the animated agents should appear, behave and interact so as to maximise the level of empathy that children have with the characters. Underlying this aim is the

perspective that if children empathise with characters a deeper exploration and understanding of bullying issues is possible. Evidence suggests whilst agent appearance and actions do not seem to influence believability for children (Woods, Hall, Sobral, Dautenhahn, & Wolke, 2003), the level of empathy felt by users can have a significant impact on agent believability (Prendinger & Ishizuka, 2001).

The considerable differences between boys and girls of the selected age group (e.g. social awareness (Weinraub, 1984), verbal and cognitive abilities (Kuhn, Sharon, & Brucken, 1978), friendship networks (Maccoby, 1988), bullying roles (Wolke & Stanford, 1999)) must be considered in the design of animated characters, bullying storylines and the creation of empathy. Prior research suggests that gender is an important consideration in the design of animated agents (Xiao, Stasko, & Catrambone, 2002). The experimentation reported here considers the impact of gender on the empathy felt by children for agents within a bullying environment and how this should be incorporated in subsequent agent design.

Initially, we discuss our approach to empathy with its focus on cognitive and affective empathy. The relationship between empathy and gender in children is then considered, identifying differences between the genders that could have a potential impact on empathic relation development. We then discuss empathic agents, highlighting previous research that considers how agents can be used to evoke empathy in users. We briefly describe bullying, identifying different types of bullying, bullying behaviors and roles and identify how this has affected scenario and agent design. We then outline the approach taken to investigate the impact of gender on the empathy felt by children for agents within a bullying scenario, which involved the use of high fidelity storyboards and questionnaires. The results from this experimentation are then presented. These are then discussed and a number of implications for design are identified. Finally, some conclusions are presented.

2 Empathy

The term empathy refers to a psychological construct that is used for heterogeneous processes between two persons. It can be defined in broad terms as “An observer reacting emotionally because he perceives that another is experiencing or about to experience an emotion” (Stotland, Mathews, Sherman, Hannson, & Richardson, 1978). Another, less broad definition is given by Wispè (Wispè, 1986) who described empathy as “the process whereby one person ‘feels her/himself into the consciousness of another person.’” Whilst a range of perspectives regarding empathy exist, we are currently considering two possible levels of empathic processes between an observer and a target: cognitive and affective.

Cognitive empathy (Holz-Ebeling & Steinmetz, 1995) refers to the process of the observer attempting to understand how a target feels in a given situation. The cues available for the observer are the behavior of the subject (including bodily and especially the facial expression of emotion) and the situation the target is dealing with. The result of this process of understanding has a cognitive outcome, e.g. “I think John is sad because Luke hits him”.

Affective empathy refers to processes with an affective outcome. When such a process takes place the observer feels something due to the perception of a target. However, there is controversy between researchers concerning the question of what quality the relationship between the emotion of the observer and the emotion of the target must be. Although there is some debate regarding affective empathy (e.g. (Stotland et al., 1978; Stroebe, Hewstone, & Stephenson, 1996)) the approach that we follow here is similar to that of (Eisenberg & Strayer, 1987) where affective empathy is considered to be when the observer’s emotion is equivalent to the target’s inner state, e.g. “I feel sorry for John because he is sad”.

2.1 Empathy and Gender

Studies using a wide range of assessment instruments have consistently found that females score higher than males on empathy (Jose, 1989). Eisenberg and Lennon (Eisenberg &

Lennon, 1983) carried out a meta-analysis of 16 studies and reported that 11 out of the 13 studies revealed higher empathy for females. Eisenberg and Lennon interpreted the findings in two ways. Firstly, males and females are aware of the stereotype that females are more emotional and caring than males (Eagly & Steffen, 1985) and secondly, males and females are supposedly socialised differently with regards to emotions (Dunn, Bretherton, & Munn, 1987). However, many behavioral empathy studies do not show clear cut gender effects (Eisenberg & Lennon, 1983).

An understanding of the issues surrounding the development of gender concepts and sex roles is necessary for the design of animated characters bullying storylines and the creation of empathy. Research studies have revealed that gender concepts and sex roles are acquired differentially for boys and girls, where boys' gender typical behavior is acquired earlier and is more strongly adhered to than girls.

Sex-role stereotyping where certain tasks and objects are associated with males or females appears as early as age 2 (Weinraub, 1984) and by age 5, children start to associate certain personality traits with male or female (Kuhn et al., 1978). Male stereotypes develop faster and in more detail than female stereotypes. Stereotyping for choice of toys and the tendency towards same-sex groups is less pronounced for girls (Maccoby, 1988) and this strengthens with age. Boys' peer groups are larger and rely more on status and reputation, and role conformity whereas girls' peer networks are smaller and more intimate. The male role depends on the avoidance of femininity, physical nature of activity and achievement. These differences help explain gender effects regarding the types of bullying behaviors experienced by boys and girls and the role of empathy.

3 Empathic Agents

Animated agents are becoming increasingly widespread as a way to establish communication between users and computers (Cassell, Sullivan, Prevost, & Churchill, 2000), although this

has been with somewhat mixed results (Dehn, 2000). The use of animated agents for well-bounded, specified tasks with goal related outcomes (e.g. help systems (Lester, Stone, & G.D., 1999) and e-commerce applications (Aberg, 2000)) seems to add little value to the interaction. However, research suggests that animated agents have particular relevance to domains with flexible and emergent tasks where empathy and believability are crucial to the goals of the system (Marsella, Johnson, & LaBore, 2000).

In considering empathy and animated agents, it is important to distinguish between empathy on the side of the agent (MacNamee, Dobbyn, Cunningham, & O'Sullivan, 2003) and empathy on the side of the user (Marsella, Johnson, & LaBore, 2003). Our focus is on the latter and we aim to create an empathic agent that is able to, by its behaviors and features allow the user to build an empathic relation with it. This requires that we construct agents that, by their appearance, situation, and behavior, are able to trigger empathy in the user. Using empathic interaction maintains and builds user emotional involvement to create a coherent cognitive and emotional experience. This results in the development of empathic relations between the user and the agent, meaning that the user perceives and models the emotion of the agent experiencing an appropriate emotion as a consequence.

A number of animated agents have been developed where empathy and the development of empathic relations have played a significant role. These include theatre (Bates, 1994), storytelling (Machado, Paiva, & Prada, 2001) and personal, social and health education (Silverman et al., 2002). The results from such research identify that it is possible to evoke empathic reactions from users and that this can result in stimulating, novel interactions. Further, applications such as Carmen's Bright Ideas (Marsella et al., 2003) highlight the potential of animated agents for exploring complex social and personal issues, through evoking empathic reactions in users.

4 Bullying Scenarios and Empathic Agents

The scenarios that we are developing within this project require believable and comprehensible storylines, plot and characters that are true to life. Producing this level of realism requires an understanding of bullying behavior within the target age group.

Bullying behavior can be classified as being direct (physical / verbal) or relational (Björkqvist, 1994; Whitney & Smith, 1993). Direct physical bullying includes acts such as hitting, kicking, pinching, taking belongings or money, and pushing or shoving. Verbal bullying includes behaviors such as name-calling, cruel teasing and taunting. Relational victimisation is defined as the purposeful damage and manipulation of peer relationships leading to social exclusion (Crick & Grotpeter, 1995) by spreading malicious gossip or withdrawal of friendships (Wolke, Woods, Bloomfield, & Karstadt, 2000)

Research studies have revealed gender differences concerning the prevalence and the types of bullying behavior utilised by males and females. Girls are less likely to be physically bullied compared to boys, but more likely to be relationally victimised, and the distribution of verbal bullying across gender is equivalent (Wolke et al., 2001). Group bullying is more likely to be encountered by girls, and more boys than girls identify themselves as children who bully others (Rigby, 1996).

Traditionally, research considered bullying behavior as a simple dichotomy comprised of the ‘pure’ bully aggressor and the ‘pure’ victim. More recently, studies have highlighted this as an oversimplification of the social group roles involved in bullying, and further principal bullying profiles have emerged, namely bully/victims, defenders, bystanders and assistants to the bully (Salmivalli, Lagerspetz, Björkqvist, Österman, & Kaukiainen, 1996; Wolke & Stanford, 1999).

Each bullying profile has distinct characteristics in terms of individual differences, social cognition styles, family factors and peer relationships. ‘Pure’ bullies bully other children but

are never victimised by others whereas ‘pure’ victims are victimised by others but never bully others. Bully/victims are both victimised and bully others at times. Defenders are important in the group process of bullying behavior as they help to defend the victim and may stand up to the bully, and usually have a high social standing within the peer group. Bystanders are generally neutral children who may view bullying behavior but do not intervene on the side of the bully or the victim. The bully assistants do not perpetrate initial bullying events but assist the ‘pure’ bully by encouraging them to continue victimising.

Our focus lies on the protagonist characters and the empathic feelings they evoke within children. These protagonists have less complex bullying profiles, for example they are either ‘pure’ bullies (bully other children but never victimized by others) or ‘pure’ victims (victimized by others but never bully). Our emphasis is on understanding the children’s empathic responses to the bully, bully assistant and victim animated agents. All bullying roles will be considered, however currently we need a deeper understanding of the responses from the children towards the protagonist before exploring more complicated inter-relationships between, defenders, bully/victims and bystanders.

5 Prototyping Empathic Agents

For this experimentation a high fidelity prototype was provided using Kar2ouche (Immersive Education, 2001). This high fidelity storyboarding tool allowed the creation of scenarios, populated with prototypical animated agents, that aim to capture both direct and relational bullying behavior taking into account the different group roles. The storyboard scripts provide two different stories about direct and relational bullying devised by experienced psychologists with expertise in bullying research. Each story is comprised of a series of episodes/chapters. Both stories begin with an introduction and background information about the protagonists. A series of episodes involving bullying incidents then occurs.



Figure 1. Physical bullying scenario



Figure 2: Relational bullying scenario

Figures 1 and 2 illustrate clips from a direct and a relational bullying scenario. In figure 1 we see the entire cast of a direct bullying situation, with the bully (Luke), the victim (John) and bully assistants in the background. In figure 2 we see the victim (Frances) in a relational bullying situation with the bully (Sarah) and the assistant bully (Janet).

5.1 Direct Bullying Scenario

The direct bullying scenario involves Luke (the bully) knocking John's (the victim) pencil case onto the floor in the classroom and then pushing him off his chair when no one else is looking. Luke then verbally abuses John and tells him to stop being a wimp and threatens John that he better not tell anybody about the incident. This happens whilst the bullying assistants are egging Luke on. The next scene shows John being upset and trying to decide what actions to take to stop the bullying happening. The story proceeds to show John trying out a number of different coping mechanisms including ignoring and trying to avoid Luke, fighting back with Luke and telling the teacher. The story illustrates ignoring Luke and fighting back as being unsuccessful strategies. The story ends with John telling the teacher and Luke being warned that if he did not stop bullying John, he would have to leave the school.

5.2 Relational Bullying Scenario

The relational bullying scenario is comprised of four episodes and begins with Sarah and Janet verbally abusing Frances and telling her to stop listening to their conversations. The verbal bullying intensifies during the first episode with Sarah and Janet making nasty

comments about France's appearance and personality. The next episode involves social exclusion as Sarah & Janet will not let Frances join in their group work at school and start to make fun of Frances's clothes. During the next episode Frances goes through a number of different possible coping strategies to deal with the bullying including laughing it off and looking like she is not bothered, telling a friend that she trusts, or avoiding the bullies. The subsequent episode depicts the unsuccessful outcome of just laughing off the bullying as this only serves to increase the bullying from Sarah and Janet. Frances also reaches the conclusion that avoiding the bullies will not be possible. The final episode proceeds to illustrate Frances confiding in a friend who has noticed that Sarah and Janet have been bullying her.

6 Method

6.1 Experimental Design

The children watched the direct and relational bullying scenarios and then completed a questionnaire (support was provided if required). This questionnaire comprised of both structured and semi-structured questions. Questions enquired firstly about the direct bullying scenario and secondly the relational bullying scenario. Questions about the child's empathic feelings towards the characters in both the scenarios followed.

6.1.1 Direct Bullying Scenario

Questions enquired about whether physical bullying happened at the respondents' school, whether they had experienced victimisation like 'John' the victim in the scenario and whether they had bullied anyone like 'Luke' the bully in the scenario. If children answered yes to experiencing or carrying out bullying they were asked to explain this in more detail. Children were asked whether the speech used in the scenario was realistic and similar to that used in their current school. Children then completed some questions about coping strategies they would employ if they were in John's (the victim) position and were asked to explain why they

would select a particular strategy. Children were also asked what would be the worst thing to do to try and stop Luke bullying John. Finally, children were asked why they thought Luke bullied John.

6.1.2 Relational Bullying Scenario

The same format of questions as for the physical scenario were used but in relation to Frances (the victim), Sarah (the bully) and Janet (bully assistant).

6.1.3 Characters in the Scenarios

Children were asked which character they liked most from both the direct and relational scenario and the reasons why. Children then stated their least preferred character with justifications for a particular selection. Next, children were asked about ‘prime characters’ in terms of if they could choose to be one of the characters, which one would they choose to be and why.

6.1.4 Emotions and Empathy

Children were asked whether they felt sorry for any of the characters and if so which characters and why, whether any of the characters made them feel angry and why, and finally, how they felt overall after watching both the direct and relational bullying scenarios (very happy, quite happy, neither happy nor sad, quite sad and very sad).

6.2 Sample

80 UK children aged 9-11 with an average age of 9.7 years (SD: 0.66) participated in the present study involving two schools. One small rural school with children from middle to upper class socio-economic status, and one larger urban school with children from predominantly lower to middle social economic status participated. 43 boys and 37 females participated.

6.3 Procedure

A trained psychology post-graduate researcher visited each class from the two schools to show the bullying scenarios and administer the questionnaire. The class watched together the direct bullying scenario followed by the relational bullying scenario. Subsequently, the researcher ensured that children understood the content of the scenarios and the names of the characters.

Children then went back to their seats and were distributed the storyboard questionnaire. Instructions were then given to the whole class that they were to complete the questionnaire individually and that the content was confidential. The researcher explained each question to the class and children were told to raise their hand if they did not understand any aspects of the questionnaire. Children were told that completion was not compulsory and that they were free to withdraw from the research at any time. Each questionnaire was collected and children were thanked for their participation.

7 Results

There were no significant gender differences between children who participated in the study and their bullying roles, i.e. an equal spread of bullies, victims, bully/victims, neutrals (with the majority falling into the neutral category) for both boys and girls for direct and relational bullying. There were no significant differences related to children's age.

7.1 Most & Least Preferred Character

9.1% of children preferred one of the 3 bullies (Luke, Sarah & Janet). Chi-square results ($\chi^2 = 25.95$, d.f. = 2, $p = 0.001$) revealed a significant association between gender and preferred character. Boys significantly preferred the male victim (John) (85.4%) whilst few males preferred the girl victim (Frances) (only 7.3%). Girls showed more differentiated preferences, with 58.3% preferring the female victim and 30.6% preferring the male victim.

The bully was the least preferred character, with only 9.3% of children least preferring a victim character, i.e. Frances or John. Chi-square analysis was carried out on the least preferred bully characters (removing the data for victims). Whilst the chi-square was not significant ($\chi = 3.43$, d.f. = 2, $p = 0.18$) it was possible to observe a trend between the genders. Boys least liked the female bully characters, with 51.4% least preferring the female bully and 20% least preferring the female bully assistant. Only 28.6% least preferred the male bully. The girls were far more evenly spread with 48.5% least preferring Luke and 42.4% least preferring Sarah. Only 9.1% ($n=3$) least preferred Janet, the bully assistant.

7.2 Prime Character

There was no gender preference for wanting to be a bully or a victim. The majority wanted to be an own gender victim (boys 83% wanting to be a male victim and girls 77% wanting to be a female victim). Chi-square results revealed a significant association ($\chi = 33.8$, d.f = 4, $p = 0.001$) between gender and prime character (which character within the scenario that the child would like to be). Boys did not want to be girls, particularly girl bullies with no boys indicating either Sarah or Janet as their prime character. 71.4% of boys wanted to be the male victim (John), 17.1% wanted to be the male bully (Luke) and 11.4% wanted to be the female victim (Frances). For the girls, 63% wanted to be Frances, 14% wanted to be John, and the remaining 23% were relatively evenly spread between the bullies. Chi-square results revealed a significant association ($\chi = 25.76$, d.f = 1, $p = 0.001$) between gender and same gender victim. 86.2% of males wanting to be John and 81.5% of females wanting to be Frances.

7.3 Affective Empathy

Whilst the chi-square was not strongly significant ($\chi = 3.46$, d.f = 1, $p = 0.06$), there was a trend for more males not to exhibit affective empathy for the characters, with 19.5% of boys not expressing affective empathy, compared to only 5.4% of girls. The girls expressed affective empathy for both victims. The boys expressed affective empathy for John, but not all

of them expressed empathy for Frances (N=8). No children expressed affective empathy for Luke, the male bully, whilst 2 girls did express empathy for the female bullies.

7.4 *Anger (Cognitive Empathy)*

Although the chi-square ($\chi^2 = 3.42$, $d.f = 1$, $p = 0.06$) was not strongly significant, there was a trend for girls (77.8%) to express more anger than boys (58.1%). This anger was directed to the bullies, with all of the bullies angering the participants.

7.5 *Coping Mechanisms*

There were no gender differences in coping mechanisms selected to deal with the direct and relational bullying situations. The majority of children (75%) suggested telling someone (whether this be teacher, friend or parent). The same coping strategies were used for both direct and relational bullying, again with no gender differences.

7.6 *Bullying Status and Affective Empathy*

All children who were classified as physical or relational bullies felt sorry for the victims. All of the children who were victims also felt sorry for the victims.

8 Discussion

Although many studies (Crick & Grotpeter, 1995; Lagerspetz & Bjorkqvist, 1994; Lagerspetz, Bjorkqvist, & Peltonen, 1988) have revealed more boys in primary school samples to be involved in direct bullying and more girls to be involved in relational bullying, this result was not replicated in this study. The distribution of children across bullying roles (bully, victim, bully/victim, neutral) was similar for both boys and girls, with the majority falling in the neutral category.

Children almost exclusively preferred the victims in the scenarios, with very few children expressing a preference for any of the three bully characters. However, there was a clear gender impact on most preferred character, with boys strongest preference being for the male victim, whilst girls were not as gender specific.

Children least preferred the bullies, with a trend for boys to show least preference for the female bullying characters. Boys indicated least preference for both the female bully and the assistant. Girls were more evenly spread between the main bullies (Sarah and Luke) and few least preferred the bully assistant. This suggests that girls are able to distinguish between the severity of the role whereas the boys were focused more on gender rather than character activity.

The majority of the participants when asked about 'prime character' wished to be a victim, but one that was the same gender as them. Notably, no boy expressed the desire to be a female bully and only 3 boys were prepared to be a female character of any sort. This has important consequences for the design of animated characters aimed at generating empathic relations.

There is a need for focused scenarios to be developed which offer children same gender animated characters with whom to empathise. The situation seems to be more extreme with boys, who clearly find it difficult to empathise with a female character. This could be an effect of age, as in this middle school age group, girls are more socially and cognitively developed which may enable them to take on both gender perspectives and the different expressed behavior patterns.

The fact that most children would choose to be a victim over the bullies may be an indication of the story plot, with the victims working through to a successful outcome (i.e. the bullying stops). However, we are aware that not all scenarios will have successful outcomes and in future work we aim to identify if an unsuccessful outcome is less likely to encourage children to choose to be a victim. This is an important factor as realism within exploring bullying demands that success is not inevitable.

Girls in the study expressed more affective empathy than the boys, with the girls expressing affective empathy for the victims of both physical and relational bullying whereas the boys

tended to express empathy only for the physical victim. However, it seems possible that this is a reflection of gender preference for males and their lack of affective empathy for girls.

Girls also revealed a higher degree of emotional response in terms of the anger they felt towards characters. In all cases the anger was aimed at the bullies rather than the victims. This outcome shows that within bullying scenarios children clearly believe and are engaging with the story, feeling sorry for the victims and angry with the bullies.

The lack of impact of gender differences and bullying type on coping mechanisms suggests that similar mechanisms are employed by children to deal with both types of bullying. This is a surprising result as it would be expected in line with previous research findings that more females would tell someone than males and that children would select different strategies depending on the type of bullying (i.e. direct or relational) (Wolke et al., 2001).

Throughout the results, there is clearly more sympathy and feelings for John, the physically bullied victim for both boys and girls, which indicates that both genders recognise the severity of physical attacks. However, this was less apparent for the relational bullying where girls appeared to have a greater understanding of the mechanics of the situation. Notably, boys were fairly evenly spread in their lack of preference for both the bully and the bully assistant, whereas girls appeared to dismiss the bully assistant and focus on the main villain. Whether this is because girls have more awareness and personal experience of relational bullying or because boys are ambivalent towards girls is not clear, although research (Björkqvist, Lagerspetz, & Kaukiainen, 1992) would support either case.

A positive result from this work has been the level of affective empathy that almost all participants expressed. This identifies the potential effectiveness of using animated agents to explore issues such as bullying and coping strategies. The gist of the storyline and the attempt to explore bullying without using a stereotypical plot was well received by all participants.

In that our project aims to encourage empathy, the results that are presented here clearly demand the acknowledgement and incorporation of gender in the design of a VLE populated by animated characters. From this study, we can suggest that girls can empathise with animated characters of either gender (although there is a clear preference for females). However, there is a strong tendency for boys not only to prefer, but to understand and empathise with their own gender. This suggests the need for more specific story tailoring (including ensuring the cast contains boys) for boys if we are seeking to encourage empathy and engagement.

We anticipated and found that the most liked character was a victim, John or Frances. However, more participants preferred John. This could be for a number of reasons, including the fact that John appeared on the screen significantly longer than the bully, however, in the relational bullying scenario there was more exposure to the bullies, yet participants still preferred the victim, Frances. More participants preferred John, considered him as prime character and expressed affective empathy for him than for Frances. Although the lack of affective empathy of the boys for Frances had an impact on this result, it also seems plausible that all children, both boys and girls, recognised direct physical bullying and the serious consequences that this can have. That is not to say, that relational bullying cannot have serious consequences, however, at age 9-11 children may be less aware of the long-term outcomes.

8.1 Applying the Results to Design

The results from this experimentation are being used to guide the design of the animated agents within the context of bullying scenarios (see figure 3). The main result, that children particularly boys empathise with same gender characters highlights the need to create gender specific scenarios, where the characters in the scenarios are the same gender as the child interacting with FearNot.



Figure 3: FearNot - Gender Specific Scenario

Not only does gender impact upon the empathy evoked, it also relates to the understandability of the scenarios, with boys showing less comprehension of relational bullying scenarios and the differentiation between bullying roles (bully, bully assistant). The conclusions drawn here, that scenarios need to be gender specific, have been verified through consultation with teachers.

FearNot scenarios are now automatically produced in a gender specific format, each scenario having a male and female version. The protagonists in each bullying scenario are either exclusively male or female. Early evaluations of these scenarios (see figure 3) identify that the characters (typically the victim) evoke a high level of empathy and that children understand the storyline and find this highly believable.

9 Conclusion

The results of the current study reveal interesting findings concerning the impact of gender on the design of animated agents for exploring bullying and coping strategies. The results reveal gender preferences towards male and female characters involved in stories about direct and relational bullying and affective empathy towards victims of bullying. This is particularly the case for boys as they appear to have much stronger gender preferences towards same-sex characters compared to girls and the storyline has a greater impact for boys if same-sex

characters are portrayed. Overall, the findings point to the careful consideration of the role of gender in the development of animated characters and specific storylines about the sensitive issue of bullying behavior.

10 Acknowledgements

This study was made possible with the help and participation of St Johns' school, Welwyn Green, Frith Manor School, Finchley. Particular thanks to Debra Massey, Lisa Oakden and Jenny Brunt. This research was conducted as part of the VICTEC project (IST-2001-33310), part-funded by the European Community Framework V program.

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12 Vitae

Sarah Woods currently coordinates the Psychology aspect of the VICTEC project at the University of Hertfordshire. This project involves designing interactive dramas within a virtual environment focusing upon bullying and social education for primary school children.

Prior to this, she worked at the Institute of Psychiatry, London (2000-2002) on an evaluation study involving psychiatric inpatient units, and at the University of Hertfordshire (1998-2000) on a large-scale study concerning bullying behavior. Her research interests include social development among children including bullying and aggressive behavior, behavioral problems and excessive crying. She has several publications in peer-reviewed journals related to these subjects and has presented at various conferences.

Lynne Hall is a Principal Lecturer in Digital Media in the School of Computing and Technology at the University of Sunderland. She gained her doctoral degree in 1993 at UMIST, UK and then worked in banking for several years, before becoming a lecturer. She teaches courses on Human Computer Interaction, multimedia and research methods. Her main research interests are synthetic characters, virtual learning environments and non-traditional user groups such as children and adults with cognitive impairment. She has published over 30 publications in peer-reviewed journals and conferences.

Dr. Kerstin Dautenhahn is Professor of Artificial Intelligence in the Department of Computer Science at University Hertfordshire in England where she coordinates the Adaptive Systems Research Group. She earned a doctoral degree in 1993 at University of Bielefeld, Germany. She teaches courses on Artificial Life, Behavior-based robotics and Intelligent Agent Systems. Her main research interests are Socially Intelligent Agents, social robotics and Artificial Life. She has edited 10 special journal issues on related subjects in different international journals and has published more than 100 research articles and edited several books.

Professor Dieter Wolke has most recently worked at the Institute of Child Health, London (1985-1990) and from 1990-1995 he was Director of Psychology at the University of Munich Children's Hospital before appointed as Research Professor of Psychology at the University of Hertfordshire, UK. In 2002 he became the Deputy Director of a large national resource

study of 14.000 families, ALSPAC at the University of Bristol. He is currently the Scientific Director at the Jacobs Foundation in Zurich. His research interests include the social development of children such as antisocial behavior and bullying, behavioral problems, the effects of maternal mental health on children and the development of preterm infants. He has authored over 120 research and review articles and textbook chapters.

Figure Legends

Figure 1. Physical bullying scenario

Figure 2: Relational bullying scenario

Figure 3: FearNot - Gender Specific Scenario