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**THE RELATIONSHIP BETWEEN BULLYING ROLES AND  
CHILDREN'S EVERYDAY DYADIC INTERACTIONS**

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**Abstract**

This study investigated the behaviour and communication of seven- to eight-year-old children during a dyadic computer task. The children participating were identified by peers as (a) initiators of bullying ('Bullies'), (b) defenders of those victimised ('Defenders') and (c) those who generally do not take on a consistent role in relation to bullying ('Non-Role' children). Children were videotaped during the task and the interaction was coded, 34 dyads participated. Defenders used significantly higher levels of supportive communication such as explanation and guidance than Bullies. The task performance of dyads consisting of Defenders with Non-Role children was significantly superior to that of dyads comprising Bullies plus Non-role children. The behaviour of the Non-Role children was influenced according to whether they were working [with](#) a Bully, a Defender or another Non-Role child. The study suggests that the roles that children adopt in relation to bullying influence their behaviour in other, non-bullying contexts.

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4           Bullying is a complex social phenomenon influenced by the behaviours and  
5 characteristics of the peer group as a whole.. Children adopt a variety of roles in relation to  
6 bullying, for example, they can act as initiators, assistants or defenders, (e.g. Salmivalli,  
7 Lagerspetz, Bjorkqvist, Osterman & Kaukiainen, 1996, Sutton & Smith, 1999), and may  
8 passively or actively encourage, resist or deliberately avoid participating in bullying episodes.  
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11           In order to understand why children adopt these roles, considerable research has  
12 been devoted to understanding how individual differences in cognitive and social information  
13 processing skills; moral understanding and social goals relate to variables such as  
14 sociometric status, age, gender, interpersonal awareness, social prestige and reputation (e.g.  
15 Arsenio & Lemerise, 2001; Crick & Dodge, 1994; Sijtsema, Veenstra, Lindberg & Salmivalli,  
16 2009; Sutton, Smith & Swettenham, 2001). The focus of the present study, however, was on  
17 children's behaviours during collaborative work and the influence that bullying roles may have  
18 on these.  
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21           A number of methods have been used with the aim of investigating and  
22 understanding bullying behaviour and its impact on children's lives. Frequently,  
23 questionnaires or interviews accessing peer-, teacher- and self-report of bullying behaviour  
24 have been used. More rarely, observational methods have been used, for example, video  
25 recordings of playground bullying (Hawkins, Pepler, & Craig, 2001; Pepler & Craig, 1995).  
26 Until now, video recording methods have not been used to study different bullying roles during  
27 interaction on classroom tasks. It is our view that it is important to learn more about how  
28 children who adopt different roles during bullying behave at times when bullying is not  
29 necessarily taking place, such as during collaborative work. Children spend a great deal of  
30 time together on a daily basis over several years at school, and behaviours during both  
31 bullying and non-bullying episodes are likely to influence each other. Both Harach and  
32 Kuczynski (2005) and the Social Information Processing Model as put forward by Crick and  
33 Dodge (1994) maintain that interpersonal exchanges are transactional and that relationships  
34 are influenced by a shared history of previous interactions.  
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37           The links between bullying roles and collaborative work have rarely been examined  
38 but Cowie and colleagues (Cowie & Berdondini, 2001; Smith, Cowie & Berdondini, 1994)  
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2 interviewed bullies, victims and bystanders about their reactions to cooperative group work.  
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4 They found that although most children felt positive about group work, bullies strongly disliked  
5 it. Our aim was to extend this initial work by observing the behaviour of different bullying roles  
6 during a dyadic collaborative task. Success on these kinds of tasks is particularly sensitive to  
7 the communications used by participants, so we sought to investigate this specific aspect in  
8 detail.  
9

### 12 **Characteristics of Bullying Roles**

14 The Participant Roles Scale (PRS) was developed by Salmivalli et al. (1996) to  
15 investigate bullying roles. The PRS took the form of a questionnaire designed to elicit  
16 nominations for the individuals in a class from their peers regarding bullying behaviours and  
17 was originally administered to twelve- to fourteen-year-old children. Salmivalli et al. (1996)  
18 distinguished six participant roles that children adopt in bullying situations as follows: Bully  
19 (ringleader; initiator of bullying episodes), Assistant (is actively involved in bullying episodes  
20 but assisting a ringleader), Reinforcer (provides an audience and possibly encouragement),  
21 Victim (target of bullying behaviour), Defender (supporter of a victim) and Outsider (a child  
22 who remains uninvolved). The categories were found to be non-exhaustive, and a proportion  
23 of children remained unclassified (Non-role children). Non-role children were considered not  
24 to have a role as they received equal nominations for more than one role, or, alternatively,  
25 very few nominations for any of the roles.  
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28 Generally, three types of bullying are recognised; physical (e.g. hitting, kicking),  
29 verbal (e.g. teasing, name-calling) and relational (e.g. social exclusion, rumour-mongering).  
30 Salmivalli et al. (1996) included a description of bullying for children at the start of the  
31 questionnaire encompassing these three types.  
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34 Sutton and Smith (1999) replicated Salmivalli et al.'s (1996) findings with an adapted  
35 instrument and found similar roles with seven- to ten-year-old children. A further study  
36 (Sutton, Smith, & Swettenham, 1999) supported the validity of Salmivalli et al.'s (1996)  
37 distinction between Ringleaders and their followers (Assistants and Reinforcers). They found  
38 that on theory of mind tests Ringleaders scored higher than children in *all* the other participant  
39 role categories. Sutton et al. (1999) proposed therefore, that the respect and possibly fear  
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2 that Ringleaders command from their peers was partly dependent on a good understanding of  
3 others' states of mind.  
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5           Goossens, Olthof and Dekker (2006) and Salmivalli et al. (1996) also conducted  
6 sociometric tests with their samples and found that bullies tended to be unpopular whereas  
7 defenders tended to be popular children. However, more recently, Sijtsema et al. (2009)  
8 found that, in adolescence, bullies may enjoy higher levels of *perceived* popularity but that  
9 defenders generally score highly on sociometric popularity at all ages. Salmivalli et al. (1996)  
10 suggest that because popular children have high sociometric status they may have less to  
11 fear from bullies if they try to protect a victim.  
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### 17 **Communication in Interactive Collaborative Tasks**

18           Research into collaborative learning has identified behaviours and communication  
19 styles that are associated with the creation of productive relationships (e.g. Joiner, Littleton,  
20 Faulkner & Miell, 2000). In collaborative dyads, productive relationships are characterised by  
21 communication that incorporates effective questioning, explanation and clarification of ideas;  
22 that offers direction and guidance and the constructive discussion of disagreements (Barron &  
23 Foot, 1991; Kruger, 1993).  
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29           Communication in collaborative tasks has been extensively studied in relation to  
30 cognitive variables such as verbal ability but has less commonly been examined in relation to  
31 social variables. There is no previous research looking at bullying roles. However, a small  
32 number of studies have examined performance and communication on collaborative tasks in  
33 relation to sociometric status (Markell & Asher, 1984; Murphy & Faulkner, 2000, 2006). Using  
34 a shape-matching task, Murphy and Faulkner (2006) found gender differences between  
35 matched-gender dyads of popular with unpopular children (ages five- to seven-years).  
36 Popular girls' performance on the task was significantly better. They were found to use  
37 significantly more directives and reminders of task rule. They also discussed disagreements  
38 and were generally more helpful and supportive to their partners than popular boys or  
39 unpopular children of both genders.  
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48           Markell and Asher (1984) paired popular children and unpopular children with  
49 average children (ages 10- 11-years) for a series of jigsaw-puzzle tasks. The communication  
50 between dyads comprising an unpopular and an average child was asymmetric, with  
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2 unpopular children using fewer directives, more agreements and more speech acts focussed  
3 on their partners' activities rather than their own. By contrast, dyads consisting of a popular  
4 and an average child were relatively egalitarian in these respects.  
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7 Finally, Murphy and Faulkner (2000) in a dyadic referential communication task with  
8 children (ages five- to six-years) reported that popular children used fewer disagreements  
9 overall but importantly, a significantly higher proportion of these were discussed as opposed  
10 to non-discussed than were those of the unpopular children.  
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13 To summarise, the literature examining communication in collaborative tasks  
14 consistently suggests that directives, guidance, questions, discussion of disagreements and  
15 explanation and clarification are elements that are associated with successful task outcomes  
16 and peer popularity.  
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### 21 **Bullying Roles and Interactive Collaborative Tasks**

22 Smith et al. (1994) reported that children who bully try to dominate and sabotage  
23 collaborative work. Cowie and Berdondini (2001) found, from interviews with 8- to 11-year-  
24 olds, that bullying children were more likely to express contempt for others and interrupt them  
25 during group work than were other children. These attitudes would seem unlikely to foster the  
26 effective collaborative activity we have described above which results from being able to  
27 share ideas and engage in constructive discussion of each other's ideas (Kruger, 1993;  
28 Mercer, 1995). We wished here to extend the findings of Cowie and Berdondini (2001) by  
29 examining communication during interactive work in more detail. In particular, we wished to  
30 compare the behaviour of bullies with that of defenders in a communicative and collaborative  
31 context. Whereas bullies disrupt group work, Salmivalli et al. (1996) surmise that defenders  
32 are popular, high status children. It seems reasonable to explore therefore, whether  
33 defenders are likely to be assertive, helpful and therefore successful in the context of shared  
34 work. Another question we wished to examine was the effect on communication for non-role  
35 children of working with either a bully or defender. As there are likely to be a large number of  
36 Non-role children in any one class their responses to different partners are therefore of  
37 interest and importance.  
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### 51 **Predictions**

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1. The task performance of Defenders and their partners will be superior to that of Bullies and Bully-partners as measured by number of moves on the task.
2. At the level of the dyad, a greater proportion of communication features associated with effective collaboration will be observed for Defenders with Non-Role partners than for Bullies with Non-Role partners.
3. Similarly, at an individual level, a greater proportion of communication features associated with effective collaboration will be observed for Defenders than for Bullies.
4. There will be differences in the verbal communication of the Non-Role partners of Bullies and the Non-Role partners of Defenders in comparison with each other.
5. There will also be differences in the verbal communication of the Non-Role partners of Bullies compared with that of Non-Role children paired with each other and Non-Role partners of Defenders compared with Non-Role children paired with each other.

### Method

#### Participants

A total of 193 children from Year 3 in seven different primary schools in Hertfordshire, UK were invited to participate. Class sizes were average for the UK and varied between 24 and 29 pupils per class.

Children were recruited through active parental permission using the opt-in consent procedure. Letters describing the study, its ethical considerations and safeguards, together with consent forms were sent to the parents/carers of 193 children. Participation was voluntary; children with parental consent were also asked whether they wished to participate. A typical participation rate of 73.6% was obtained (Warden & McKinnon, 2003) giving a total sample pool of 142 children (51% boys) between 6 years 9 months and 9 years 0 months ( $M = 7$  years 7 months,  $SD = 4.25$  months). For children without parental permission, 43% were boys. There was no significant difference in the ages of children with and without parental permission.

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#### Overview of Sampling Procedures

In order to select a sample of children to take part in the main study, all 142 children from the sample pool were individually tested by the first author to ascertain firstly, their

1  
2 participant role status (PRS) according to the definitions given by Salmivalli et al. (1996) and  
3  
4 secondly, their verbal ability. An adapted form of the PRS interview suitable for use with 7 –  
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6 10 year old children (Sutton & Smith, 1999) was used to identify a sample of children with the  
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8 role status 'Bully' or 'Defender' and a sample of 'Non-Role' children. The British Picture  
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10 Vocabulary Scale II (BPVS II; Dunn, Dunn, Whetton & Burley, 1997) was used to measure  
11  
12 verbal ability. All data were collected by means of individual interviews with each child. The  
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14 interviews took place in a quiet place in the each child's school where privacy could be  
15  
16 guaranteed and lasted approximately 30 minutes. Children were assigned to dyads on the  
17  
18 basis of their PRS categories and dyads were matched for gender and BPVS scores. The  
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20 interview also included a sociometric interview (Coie, Dodge & Coppotelli, 1982) and the  
21  
22 Social Behaviour Scale (prosocial subscale) (Warden & Mackinnon, 2003). These were not  
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24 used for the purposes of selecting participants for the main study but took up about 10  
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26 minutes of this time. ▾

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**Deleted:** Children identified as either Bullies or Defenders were matched with a Non-Role child to form dyads, then, from the remaining pool of children, as many Non-Role children were matched into dyads as possible until the pool was exhausted. Children were matched on the basis of verbal ability to form same-gender dyads. The mean score for the BPVS across the sample of 142 children was 95.51 ( $SD = 38.25$ ) with scores ranging from 70.00 to 133.00. Children within dyads were matched so that they did not differ by more than 5 points on the BPVS scale. Sixty-eight children from the original sample pool were identified as being eligible to participate in the main study. Children were allocated to the dyads as follows: ¶  
10 Bully plus Non-Role dyads (10 boy-dyads, 0 girl-dyads) ¶  
13 Defender plus Non-Role dyads (5 boy-dyads, 8 girl-dyads) ¶  
11 Non-role plus Non-Role dyads (2 boy-dyads, 9 girl-dyads) ¶  
Equal distribution of gender across the different dyads was attempted as far as possible but, as we had no female Bullies in our sample, this was not entirely possible.

### 25 Sampling Measures and Scoring Procedures

26 **Participant role status.** The Participant Roles Scale (PRS) questionnaire (Salmivalli  
27  
28 et al. 1996) adapted for use with 7 – 10 year-old children by Sutton and Smith (1999) was  
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30 used to determine children's role or non-role status according to the following subscales:

- 31 Bully - A child who initiates or takes the lead in bullying incidents
- 32 Assistant - A child who joins in the bullying but who does not initiate it
- 33 Reinforcer - A child who incites the bully and provides an audience
- 34 Defender - A child who sticks up for or consoles the victim
- 35 Outsider - A child who actively ignores bullying situations by staying away
- 36 Victim - A child who is nominated as someone who gets bullied

37  
38 Sutton and Smith (1999) reported moderate to good internal reliability for these six subscales  
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40 (Cronbach's alphas: Bully  $\alpha$  .85, Reinforcer  $\alpha$  .88, Assistant  $\alpha$  .67, Defender  $\alpha$  .80, and  
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42 Outsider  $\alpha$  .55. For the present study, Cronbach's alphas were: Bully  $\alpha$  .90, Reinforcer  $\alpha$  .56,  
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44 Assistant  $\alpha$  .72, Defender  $\alpha$  .88, and Outsider  $\alpha$  .42. The victim subscale consists of a single  
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46 item therefore  $\alpha$  not applicable).  
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49 For Sutton and Smith's (1999) adapted version of the PRS, children are asked in an  
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51 interview to provide peer nominations in relation to a set of 21 behavioural descriptions  
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1 relating to the various role descriptions described above. We requested nominations from  
 2 both sexes; children could provide as many nominations for each role as they wished.  
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 5 As interviewing children about bullying amongst their classmates is a sensitive  
 6 subject, the first author used the following procedure for the PRS interview to minimise ethical  
 7 problems (such as children feeling that they might be 'telling tales' on classmates). A set of  
 8 cards was prepared, with one card for every child in the class bearing the child's name. On  
 9 the reverse of the card was a unique number identifying this child. The cards were laid out  
 10 face up by the interviewer who read out the names on each card and checked that the  
 11 children were able to identify each of their classmates by reading the names on the cards.  
 12 The children were then asked to provide nominations. They could generally do this easily but  
 13 were given additional explanation by the researcher if necessary. The children were asked to  
 14 find the card bearing the name of the child they were nominating, and then asked to read the  
 15 number on the reverse aloud to the researcher. It was emphasised to the children that they  
 16 were not to disclose the *name* on the card to the interviewer. This procedure ensured that the  
 17 child's confidentiality was protected and that the researcher conducting the interviews  
 18 remained blind to the PRS status of each child. As an additional precaution the interviewer  
 19 was seated behind a low screen where the children's faces but not the cards were visible to  
 20 her.  
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33 **Scoring procedure.** Previous authors (Salmivalli et al. 1996; Sutton & Smith, 1999)  
 34 have employed PRS scores to allocate children to the categories 'Bully', 'Defender' etc. using  
 35 one of two methods: Z-scores standardised over the whole class or absolute (percentage)  
 36 numbers of nominators. Goossens et al. (2006) reviewed these methods and recommended  
 37 the absolute method on the grounds that it avoids the problem of very high scorers masking  
 38 scores for other children in the class. We therefore used the absolute method and allocated  
 39 children to a particular role if they were nominated by 25% or more of their classmates for that  
 40 role and by less than 25% for any other role.  
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46 In total, 21 children were identified as Bullies from the total pool of 142. Using an  
 47 allocation rate of 25% is highly conservative compared to previous studies such as Salmivalli  
 48 et al. (1996) and Sutton et al. (1999). Therefore, relatively fewer children were allocated to  
 49 the roles compared to children in these studies. The following numbers of children met the  
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**Deleted:** Salmivalli et al. (1996) used scores for the children that were standardised by class to allocate children to the participant roles. The exception to this was the 'victim' role where a child was allocated to this role if he/she was nominated by 30% or more of his/her classmates regardless of any other nominations they received. Sutton and Smith (1999) investigated different methods for allocating children to roles with their adapted instrument including standardisation by class, standardisation across the entire sample, no standardisation and factor roles but did not recommend any particular method. Goossens et al. (2006) compared relative (standardised z-scores) and absolute (percentage) methods of assigning roles using the PRS and recommend use of the latter. They argue that by creating z-transformations by class, all the PRS roles are filled and hence one is assuming that every class will have all or most of the roles represented, but that it is entirely possible that some classes may not have children in some of the roles e.g. there may be no Bullies or Defenders in some classes. Furthermore, the presence of extremely high scorers for a role in a class may mask the presence of other children who would otherwise fill that role. Hence, we allocated children to a particular role if they were nominated by 25% or more of their classmates for that role and by less than 25% for any other role, with the exception of victims where we followed Salmivalli et al. (1996) and allocated children if they received 30% or more nominations. Goossens et al. (2006) investigated the use of 10%, 15% and 20% of nominations for allocation, and concluded that 15% or 20% are advantageous because this results in fewer children meeting the criteria for allocation to more than one role. As we were undertaking an observational study, we wished to use a high nomination rate (25%) for allocation to roles in order to select the most representative children within each role. Using this method for allocation, none of the children met the criteria for more than one role.

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2 criteria for the other PRS roles: Assistant 4, Reinforcer 1, Outsider 0, Defender 25, Victim 1.  
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4 The remainder of the children did not meet any criteria for any of the roles and hence  
5  
6 remained unclassified (Non-Role children).

7 **Verbal ability.** The British Picture Vocabulary Scale II (BPVS II; Dunn et al. 1997)  
8  
9 was used as the measure of verbal ability. The BPVS is a norm-referenced, standardized  
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11 assessment of receptive (spoken) vocabulary for Standard English for use with children ages  
12  
13 between 3 years 0 months and 15 years 8 months. This test was administered and scored  
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15 according to the instructions provided in the testing manual. The manual provides norms and  
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17 verbal mental age equivalents for these scores. According to the manual the BPVS has a  
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19 normal distribution and good reliability (Cronbach's alpha  $\alpha$  0.93, median split-half = 0.86).

20 **Additional measures.** To obtain a sociometric popularity measure (as per Coie et  
21  
22 al., 1982) the children were first asked to nominate three children that they liked the most and  
23  
24 liked the least in their class. They were then asked to nominate children according to the  
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26 Social Behaviour Scale (Warden & Mackinnon, 2003), we used the prosocial subscale only.  
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28 These measures were used to provide information on the characteristics of the sample, not to  
29  
30 select children for participation in the main study.

31 **Scoring procedure for additional measures.** Allocation to the categories of  
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33 Popular, Unpopular, Neglected, Controversial and Average for the sociometric test was  
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35 calculated according to binomial probability as described by Newcombe and Bukowski (1983).  
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37 This was in preference to the standardisation procedure described by Coie et al. (1982) to  
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39 overcome the problems associated with standardisation between school classes that vary  
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41 (see Newcombe & Bukowski, 1983 for full details). Scores for the Social Behaviour Scale  
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43 were calculated as described by the authors of the scale, Warden and Mackinnon (2003).

#### 44 **Study Design**

45 Our first aim was to compare the performance and behaviour of Bullies and  
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47 Defenders on a dyadic collaborative task when these children were working with a Non-role  
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49 child. Our second aim was to compare the performance and behaviour of Non-role children  
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51 according to whether they were working with Bullies, Defenders or other Non-role children.

52 All comparisons were between-subjects. Children in the dyads were classmates and  
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54 therefore known to each other.

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Deleted: Children were selected for participation in the study on the basis of their PRS status (Bully, Defender or Non-Role) and three types of dyads were constructed consisting of (a) a Bully plus a Non-role child (Bully-Non-Role dyads), (b) a Defender plus a Non-role child (Defender-Non-Role dyads) or (c) two Non-role children (Non-role plus Non-Role dyads).

Children identified as either Bullies or Defenders were matched with a Non-Role child to form dyads, then, from the remaining pool of children, as many Non-Role children were matched into dyads as possible until the pool was exhausted. Children were matched on the basis of verbal ability to form same-gender dyads. The mean score for the BPVS across the sample of 142 children was 95.51 ( $SD = 38.25$ ) with scores ranging from 70.00 to 133.00. Children within dyads were matched so that they did not differ by more than 5 points on the BPVS scale. Sixty-eight children from the original sample pool were identified as being eligible to participate in the main study. Children were allocated to the dyads as follows:

10 Bully plus Non-Role dyads (10 boy-dyads, 0 girl-dyads)

13 Defender plus Non-Role dyads (5 boy-dyads, 8 girl-dyads)

11 Non-role plus Non-Role dyads (2 boy-dyads, 9 girl-dyads)

Equal distribution of gender across the different dyads was attempted as far as possible but, as we had no female Bullies in our sample, this was not entirely possible.

Data were also collected on the children's sociometric popularity and prosocial behaviour for comparison with previous research. However participants were selected on the PRS categories and matched on verbal ability, and not selected on popularity or prosocial behaviour.

**Deleted:** To control for possible effects of verbal ability on the task, dyads were matched on their BPVS scores.

Role allocation, matching and selection of dyads were undertaken by the second author so that the first author (who administered the PRS and BPVS instruments, supervised the collaborative computer task and coded and analysed the videotapes) remained blind to the role status of the 68 children selected to participate in the main study.

### Main Study Procedure

The 34 dyads were invited to play the 'Shopping Task' collaborative computer game. The children played the game at their own schools in an area where they were used to working but where interruptions by other children were minimised.

For this task pairs of children were given a shopping list containing six items and were instructed to take a 'car' around a 'town' to collect the items from the shops and place them into their shopping basket. Each dyad used a single mouse to navigate the car around an interactive town map that contained various landmarks, including several shops. The

1  
2 screen display also featured a 'Yellow Pages' reference section that could be consulted to  
3 identify which shops contained various items, and a shopping basket that allowed children to  
4 see which items on the list they had already collected (see Figure 1). Instructions about  
5 sharing the mouse and collecting the different items were left deliberately vague so that  
6 children would be obliged to negotiate these aspects of the task for themselves. It was  
7 emphasised to the children that the purpose of the task was to collect all the items on the list  
8 in the fewest possible moves. A counter on the computer display gave the children feedback  
9 about how many moves they had made. Children completed the game when they had  
10 collected all six items which was generally in about 10 minutes. Children had one practice  
11 trial with an experimenter supervising to familiarise themselves with the task and were then  
12 videotaped whilst undertaking the experimental trial without supervision. The researcher  
13 remained nearby to intervene if necessary, this happened on only one occasion when one of  
14 the children wandered away.

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16 The interviewer and supervisor of the 'Shopping Task' was the first author. Training  
17 was accomplished simultaneously with piloting for the adapted questionnaire, the card  
18 numbering system and the shopping game task. Problems with procedures or interviewing  
19 could thus be addressed before commencing the main study. Piloting was carried out with a  
20 class of children who did not participate in the main study.

### 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

#### Experimental Measures and Scoring Procedures for Main Shopping Task Study

Radziszewska and Rogoff (1988) established that the Shopping task can be used  
successfully to investigate collaboration and joint problem solving for a similar age group to  
that participating in this study. Pilot testing indicated that our computerised version of this  
task was highly appealing to children. We collected the following measures: Task  
performance, mouse possession and observational measures of verbal communication.

**Task performance.** The total number of moves made to and from the shops was  
recorded by our computer program and provided a measure of performance.

**Mouse possession.** Two different measures were used for mouse possession: (a)  
The percentage of time that each child had the mouse in their hand as seen on the  
videotapes, (b) the number of turns taken by each child. The children generally took turns to  
collect each of the items on the shopping list. The total number of turns almost always

1  
2 corresponded to the number of items on the shopping list (i.e. six). There were, however,  
3  
4 some instances where one child kept possession of the mouse throughout the game. In  
5  
6 these cases the child was coded as taking six turns and the partner as none. In one case the  
7  
8 children took seven turns in total where they mistakenly collected the wrong shopping item  
9  
10 and then corrected their mistake, in this case the total number of turns was coded.

11  
12 Coding was undertaken by the first author and a research assistant coded 10% of the  
13  
14 tapes for inter-rater reliability. Training of the research assistant was brief as coding for  
15  
16 mouse possession was straightforward; the children passed the mouse back and forth to  
17  
18 each other quite clearly except for one dyad who could not be coded as their hands were  
19  
20 obscured on the tape. Inter-rater agreement for percentage of time children had mouse  
21  
22 possession  $r = .97$ ,  $p < .0001$ , the Kappa value for the turn-taking code was [excellent \(Kappa](#)  
23  
24 [= .96\)](#).

25  
26 **Observational measures of verbal communication.** The total interaction for each  
27  
28 dyad was used for verbal analysis and all of the children's conversation was transcribed.  
29  
30 Transcripts were checked for accuracy against the videotapes by the authors and segmented  
31  
32 into thought units. A thought unit is one expressed idea or fragment, as defined by Gottman  
33  
34 and Parkhurst (1980) and Gottman and Parker (1986). The transcripts were then coded with  
35  
36 each thought unit receiving a code. Coders used the transcript and videotape simultaneously  
37  
38 to make coding decisions; all coders were blind to the children's PRS status. [For the coding of](#)  
39  
40 [thought units the value of Kappa was .88.](#)

41  
42 **Coding and analysis.** Our coding system was based on similar systems we used for  
43  
44 previous observations of interactive tasks (Murphy & Faulkner 2000, 2006). We included  
45  
46 codes to reflect aspects of verbal communication known to impact task performance and  
47  
48 working relationships: Questions, explanation, directives, guidance, and discussed  
49  
50 disagreements. We also included codes categorising particular communications specific to  
51  
52 the computerised Shopping Task (see Appendix 1).

**Deleted:** for the full system with coding descriptions

53  
54 Directives were coded as 'Demands'. Our system initially differentiated between  
55  
56 strong demands ('Do that') and softened 'polite' demands ('Could you help me, please?').  
57  
58 However there were no significant differences between these types of demands so they were  
59  
60 combined and reported together. 'Directive-Guidance' was a sub-category of 'Demands'

1  
2 which related specifically to instances where one child was giving his/her partner guidance on  
3 using the mouse to 'navigate' around the town map. 'Information' referred to all factual  
4 statements not covered by other codes, 'Explanatory-Information' was a sub-category  
5 representing all task-specific information concerned with organising, monitoring or explaining  
6 the task. Questions were initially coded into three types but questions of all kinds were  
7 unusual during this particular task and so were finally summed together for analysis.  
8  
9 Agreements and disagreements were coded in relation to either (a) the decision to be made  
10 about the action to be taken next on the task ('Agreement-Action', 'Disagreement-Action'),  
11 which meant complying or not complying to a partner's demand or (b) matters of fact about  
12 the task ('Agreement-Fact', 'Disagreement-Fact'), such as the location of a particular item on  
13 the map which did not involve compliance. Disagreements were then subject to a second  
14 coding to distinguish between 'Discussed Disagreements' and 'Non-Discussed  
15 Disagreements'.

16  
17 We coded positive and negative 'Feeling Statements' that indicated children's  
18 reactions to the task and/or each other and 'You and Me' statements where children  
19 commented on aspects of their shared experience. The latter were rare and are not reported  
20 further. 'Off-task Talk' referred to all conversation that was not task-related.

21  
22 The first coder was the first author and ten percent of the videotapes were coded by a  
23 research assistant to test inter-rater reliability. The two coders used the codes together with  
24 examples from the transcripts and video data and discussed interpretation. They then  
25 practiced coding transcripts and videotapes together until good agreement was reached.

26  
27 Kappa values for the codes were as follows: Demands .89, Directive-Guidance .87, Feeling  
28 Statements .92, Agreement-Action .89, Agreement-Fact .95, Disagreement-Action .58,  
29 Disagreement-Fact .66, Discussed-Disagreement .88, Non-Discussed Disagreement .92,  
30 Information .87, Explanatory-Information Statements .82, Questions .98, Off-Task Talk .94.

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. Thought Units .88,

## Results

### Participant Characteristics

1  
2 Table 1 shows characteristics of participants in terms of age, gender, verbal ability  
3 (BPVS score), popularity (sociometric status) and prosocial score. Although Bullies in the  
4 'Shopping Task' sample were somewhat older than the other children, age differences  
5 between the groups were not significant. An ANOVA showed significant differences between  
6 the different PRS categories ( $F(4, 63) = 8.46, p < .001$ ) for BPVS scores, post-hoc  
7 (Bonferroni) tests indicated significant differences between Defenders and Bullies ( $p < .001$ ),  
8 Defenders and Bully-partners ( $p < .01$ ), Bullies and Defender-partners ( $p < .001$ ). For  
9 prosocial scores, an ANOVA was again significant ( $F(4,63) = 4.31, p < .01$ ) and post hoc  
10 (Bonferroni) tests show significant differences between Defenders and Bullies ( $p < .01$ ),  
11 Defenders and Bully-partners ( $p < .05$ ) and Defenders and Non-role pairs ( $p < .05$ ).  
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### 19 Shopping Task Performance

20 The aim of the 'Shopping Task' was to collect all six items into the shopping basket in  
21 as few moves as possible. Our first prediction was that collaboration between Defenders and  
22 their partners would be more effective than between Bullies and Bully-partners as measured  
23 by performance on the task.  
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27 Defender-Non-Role dyads achieved the best mean performance as they completed  
28 the task in the fewest number of moves ( $M = 69.30, SD = 12.51$ ), Bully-Non-Role dyads  
29 showed the worst performance ( $M = 112.00, SD = 48.42$ ) with Non-Role plus Non-Role dyads  
30 performing intermediately ( $M = 98.55, SD = 38.28$ ). An ANOVA showed significant  
31 differences for PRS categories ( $F(3,37) = 3.31, p < .05$ ) and post-hoc tests indicate a  
32 significant difference between defender dyads and bully dyads ( $p < .05$ ). A multiple regression  
33 analysis (entry method) was carried out with performance (number of moves) as the dependent  
34 variable. The predictor variables were age, gender, BPVS score and PRS role (there were no  
35 highly correlated variables, correlation coefficient between age and BPVS was  $r = .02$ , non-  
36 significant). Mean age and mean BPVS score for the dyad were used. Dummy variables were  
37 created for the Bully, Defender and Non-role categories, and for gender. The deviation method  
38 was used in preference to a reference category for the PRS dummy variables. Regression  
39 diagnostics were run, including checks for outliers and influential cases, and the data were to  
40 be found suitable for such analyses.  
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2 Table 2 shows that at the first stage of the hierarchical regression, where the  
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4 Defender variable, Bully variable and Non-Role variable are compared with each other, both  
5  
6 the Defender and Bully variables contribute significantly to performance on the task, but the  
7  
8 Bully variable accounts for a significant decrease in performance whereas the Defender  
9  
10 variable accounts for a significant improvement in performance. The Defender variable  
11  
12 remained significant even when age, gender and verbal ability (as measured by BPVS score)  
13  
14 were introduced individually. However, the Bully variable remained significant only after the  
15  
16 introduction of the age variable but was non-significant after the introduction of gender and  
17  
18 verbal ability. It is important to note however, that although gender differed between Bullies  
19  
20 and Defenders (all Bullies were boys) and Bullies' verbal ability scores were significantly  
21  
22 lower than those of Defenders, neither gender nor verbal ability had a significant effect on  
23  
24 performance in the regressions.

### 25 **Mouse Possession**

26 Children were keen to play the game and eager to take their own turn with the  
27  
28 mouse. However, there were no significant differences on any of the measures used for  
29  
30 mouse possession between any of the groups of children.

### 31 **Verbal Communication Measures**

32 Our second, third and fourth predictions stated that Defender-Non-role dyads would  
33  
34 use a greater proportion of communication features known to be associated with effective  
35  
36 collaboration than would Bully-Non-role dyads both at dyadic and individual level. Hence, a  
37  
38 series of planned two-way comparisons for each communication code was carried out (a)  
39  
40 between Defender-Non-role dyads and Bully-Non-role dyads, (b) between individual Bullies  
41  
42 and Defenders and, (c) between individual Bully-partners and Defender-partners.  
43  
44 Bonferroni's adjustment was not used for these comparisons (Field, 2005). Our fifth and final  
45  
46 prediction concerned comparisons between (d) individual Bully-partners and individual  
47  
48 children in Non-role plus Non-role dyads and (e) individual Defender-partners and individual  
49  
50 children in Non-Role plus Non-Role dyads. Again two-way planned comparisons were used  
51  
52 without Bonferroni's adjustment. For all verbal communication measures non-parametric  
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54 tests were used as the data did not meet the assumptions of normal distribution.  
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As described above, speech was divided into thought units for coding. Bully-Non-Role dyads had the highest mean number of thought units ( $M = 91.60$ ,  $SD = 32.38$ ) and Defender-Non-role dyads the fewest ( $M = 73.88$ ,  $SD = 27.83$ ) with Non-role plus Non-role dyads showing an intermediate number ( $M = 88.36$ ,  $SD = 27.99$ ). However none of these differences were significant. Verbal interaction codes have been expressed as a percentage of the total number of the child's thought units.

**Verbal communication measures: Dyads.**

**Defender-Non-role dyads and Bully-Non-role dyads.** Mann-Whitney tests show that Defender-Non-Role Dyads used significantly more Directive-Guidance ( $M = 8.38$ ,  $SD = 4.71$ ) than Bully-Non-Role dyads ( $M = 4.44$ ,  $SD = 1.92$ , Mann-Whitney  $U = 17.50$ ,  $p < .01$ ,  $r = -.61$ ). Also, Defender-Non-Role dyads were significantly more likely to agree to proposed actions (Agreement-Action  $M = 3.97$ ,  $SD = 2.13$ , Mann-Whitney  $U = 26.0$ ,  $p < .05$ ,  $r = -.50$ ) and were less likely to disagree to factual statements (Disagreement-Fact  $M = 1.50$ ,  $SD = 1.17$ , Mann-Whitney  $U = 59.5$ ,  $p < .05$ ,  $r = -.49$ ) than Bully-Non-Role dyads ( $M = 1.83$ ,  $SD = 1.48$  and  $M = 3.85$ ,  $SD = 2.28$  respectively). Although Bully-Non-Role dyads engaged in more Off-Task Talk on average than Defenders, there was wide individual variation in this and the difference was not significant. Our second prediction is therefore partially borne out for Directive-Guidance which has been previously associated with effective collaboration, although there were no differences on other measures such as Explanatory-Information Statements. There were no differences between the dyads for use of any of the Feeling Statements. The behaviour of the Non-role plus Non-role dyads mirrors that of their performance on the Shopping Task and generally falls between the Bully-Non-role dyads and Defender-Non-role Dyads.

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**Verbal communication measures: Individuals.**

There were no significant differences in the use of Demands, Questions, Information Statements or Feeling Statements by any of the children. Table 3 shows means and standard deviations for all individual verbal communication measures.

**Defenders and Bullies.** Defenders were found to use significantly more Directive-Guidance (Mann-Whitney  $U = 34.00$ ,  $p < .05$ ,  $r = -.40$ ), and Explanatory-Information Statements (Mann-Whitney  $U = 35.00$ ,  $p < .05$ ,  $r = -.38$ ) and significantly fewer total

1  
2 disagreements (Mann-Whitney  $U = 20.00$ ,  $p < .001$ ,  $r = .58$ ) and Disagreement-Facts (Mann-  
3  
4 Whitney  $U = 63.50$ ,  $p < .001$ ,  $r = -.67$ ) than Bullies. Bullies also tended to engage in more  
5  
6 Off-Task Talk than Defenders, however, as with the dyadic data, there was wide individual  
7  
8 variation and differences were not significant. In *absolute* terms, Bullies used more  
9  
10 disagreements overall and were found to use more Discussed-Disagreements than  
11  
12 Defenders. However, when differences in the *proportion* of disagreements that were Non-  
13  
14 Discussed versus Discussed were examined; it was found that for Bullies the mean proportion  
15  
16 was 0.66, whereas for Defenders it was 0.32. Bullies used a significantly higher *proportion* of  
17  
18 Non-Discussed Disagreements than Defenders (Mann-Whitney  $U = 34.50$ ,  $p < .05$ ,  $r = -.39$ ).  
19  
20 Hence, our third prediction, that individual Defenders would use more effective  
21  
22 communication than Bullies was therefore strongly supported as the use of directives,  
23  
24 guidance, discussed disagreements and explanation have all been shown to be linked with  
25  
26 successful collaborative relationships.

27  
28 ***Defender-partners and Bully-partners.*** Our fourth prediction was concerned with  
29  
30 differences in the behaviours of the Non-Role children depending on whether they were  
31  
32 partnered with a Bully or a Defender. Partners within dyads tended to mirror each other in the  
33  
34 use of Off-Task Talk with Bully-partners using much more of this type of talk than Defender-  
35  
36 partners although differences did not reach significance.

37  
38 Bully-partners used significantly more Explanatory-Information Statements than  
39  
40 Defender-partners, (Mann-Whitney  $U = 37$ ,  $p < .05$ ,  $r = -.33$ ), furthermore, they used more  
41  
42 than all the other groups of children, including Defenders. Bully-partners and Defender-  
43  
44 partners used similar proportions of Non-Discussed- to Discussed-Disagreements with no  
45  
46 significant differences.

47  
48 Defender-partners use significantly more total agreements, Agreements-Action and  
49  
50 Agreements-Fact, than Bully-partners (Mann-Whitney  $U = 21.0$ ,  $p < .01$ ,  $r = -.57$  Mann-  
51  
52 Whitney  $U = 19.0$ ,  $p < .001$ ,  $r = -.60$  and Mann-Whitney  $U = 37.0$ ,  $p < .01$ ,  $r = -.36$   
53  
54 respectively). Bully-partners showed very low levels of all types of agreement, again they  
55  
56 differed from all the other children in this respect.

57  
58 ***Asymmetry within the Dyads.*** The exceptionally high use of Explanatory-Information  
59  
60 Statements and exceptionally low use of Agreement-Actions by Bully-partners that we

1  
2 observed was explored further by examination of the use of the different forms of  
3  
4 communication between children within the same dyad. Comparisons were made between  
5  
6 Bullies and their partners, and Defenders and their partners. There were two significant  
7  
8 differences between Bullies and their partners; Bully-partners used significantly more  
9  
10 Explanatory-Information Statements than Bullies (Mann-Whitney  $U = 17.0$ ,  $p < .05$ ,  $r = -.55$ )  
11  
12 and significantly less total agreement (Mann-Whitney  $U = 21.00$ ,  $p < .05$ ,  $r = -.49$ ),  
13  
14 Agreement-Action (Mann-Whitney  $U = 21.0$ ,  $p < .05$ ,  $r = -.43$ ) and Agreement-Fact (Mann-  
15  
16 Whitney  $U = 26.0$ ,  $p < .05$ ,  $r = -.40$ ). There were no significant differences for any measures  
17  
18 between Defenders and their partners.

19  
20 ***Bully-partners and Non-role plus Non-role children*** Differences once more  
21  
22 emerged between children in Non-Role plus Non-Role dyads and Bully-partners. Bully-  
23  
24 partners use significantly fewer total agreement and Agreement-Action (Mann-Whitney  $U =$   
25  
26  $50.0$ ,  $p < .01$ ,  $r = -.43$ , Mann-Whitney  $U = 51.0$ ,  $p < .01$ ,  $r = -.42$  respectively) and near  
27  
28 significantly more Explanatory-Information Statements (Mann-Whitney  $U = 70.0$ ,  $p = .055$ ,  $r =$   
29  
30  $-.28$ ). All other measures were non-significant.

31  
32 ***Defender partners and Non-Role plus Non-Role children.*** There were no  
33  
34 significant differences between children in Non-Role plus Non-Role dyads and Defender-  
35  
36 partners on any measures.

### 37 Discussion

38  
39 The study had two main aims: (a) to compare the behaviour and communication of  
40  
41 Bullies and Defenders when working on an interactive task (b) to examine the behaviour and  
42  
43 communication of the Non-Role partners of the Bullies and Defenders on this task.

44  
45 As we had predicted, Defenders generally used more of the communications  
46  
47 associated with successful performance on collaborative tasks than did Bullies. Examples of  
48  
49 this were the provision of guidance for their partners on navigating the 'car' around the 'town'  
50  
51 (directive-guidance), high use of explanation (explanatory-information) and when  
52  
53 disagreements arose they were dealt with by discussion rather than by disparaging or  
54  
55 ignoring partners' views.

56  
57 Non-Role children's behaviour appeared to be highly influenced by their partners.  
58  
59 There were no significant differences in the communication of Non-Role children partnered  
60

1  
2 with Defenders or other Non-Role children. When these Non-Role children were with Bullies,  
3  
4 however, they used very high levels of explanation and very low levels of all kinds of  
5  
6 agreement compared to the Non-Role children partnered with Defenders and other Non-Role  
7  
8 children.

9 Performance was also directly affected by composition of the dyads; dyads  
10 comprising a Defender and a Non-Role child achieved the best performance on the task,  
11 Bully-Non-Role dyads the worst with Non-Role plus Non-Role dyads in-between. These  
12  
13 differences in performance remained significant after controlling for the verbal ability, age and  
14  
15 gender of the dyads. The behaviour of the children in each of the PRS categories is  
16  
17 considered further.

### 18 19 **Defenders**

20 Defenders' behaviour during the interactive task was generally consistent with the  
21  
22 confident but also empathic role that other studies have reported them as adopting in bullying  
23  
24 situations. They scored very highly on the prosocial scale as one may expect from children  
25  
26 who aid those in distress in bullying situations. They were less likely to disagree with their  
27  
28 partners than Bullies and their use of Explanatory-Information Statements provided support  
29  
30 for their partners. When they did disagree, a significantly lower proportion of their  
31  
32 disagreements compared with those of Bullies were of the non-constructive, non-discussed  
33  
34 kind. Their high use of Directive-Guidance is helpful but as it requires telling the partner  
35  
36 where to move the mouse it also requires a certain amount of confidence. Directives tend to  
37  
38 be used by more self-assured, popular children (Murphy & Faulkner, 2006). Use of these  
39  
40 communications was reflected in the current study by the Defender-Non-Role dyads' superior  
41  
42 performance on the task.

### 43 44 **Bullies**

45 The behaviour of Bullies in the collaborative task was less obviously related to the  
46  
47 role they are typically reported as adopting during bullying situations. Bully-Non-Role dyads  
48  
49 had the poorest performance on the task of any of the dyads. Bullies disagreed with their  
50  
51 partners more and a significantly higher proportion of their disagreements, as opposed to  
52  
53 Defenders' disagreements, were of the unsupportive, non-discussed kind. They also gave  
54  
55 significantly fewer helpful explanations (Explanatory-Information) and were less likely to give  
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2 partners navigational instructions (Directive-Guidance) than the Defender children.  
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4           However, it is also interesting to reflect on the measures on which Bullies did not  
5 differ from the other children where differences might have expected. Bullies did not use  
6 demands or express negative or positive feeling statements to a greater extent than the other  
7 children. Also, Bullies and Defenders showed similar amounts of agreement and Bullies did  
8 not take control of the mouse any more than the other children. Therefore, rather than  
9 demonstrating overt negative behaviour, Bullies showed a lack of the positive kinds of  
10 behaviour demonstrated by Defenders. It is possible that class peer relationships could be  
11 moulded by what individuals fail to do as much as by what they actually do. Bullies did not  
12 reinforce hostile relationships during the task, but on the other hand, they did not appear to  
13 take the opportunity of a positive situation to ameliorate relationships with their peers either.  
14 Whether they were unwilling or unable to do so is impossible to determine from our  
15 observations. However Cowie and Berdondini (2001) found that Bullies expressed contempt  
16 and showed little concern for others' feelings during cooperative group work, thereby  
17 suggesting low motivation to build positive relationships. Bullies in our sample were also  
18 generally quite unpopular (six out of ten scored above the threshold for unpopularity).  
19  
20

21           However, it is also possible that Bullies experience other, additional difficulties with  
22 this kind of task. Monks, Smith and Swettenham (2005) have suggested that Bullies have  
23 problems with executive control and planning. It is possible, therefore, that Bullies may have  
24 encountered cognitive or executive difficulties with the Shopping Task as successful  
25 performance requires a degree of planning. The performance of the Bully-Non-Role dyads on  
26 the shopping task was the worst of all the dyads. As all the children enjoyed the task, we  
27 surmise that this indicates that the Bullies had more problems executing the task, rather than  
28 that they were unwilling to carry it out. It may be that Bullies' cognitive problems necessitated  
29 the very high level of compensatory Explanatory-Information Statements used by the Bully-  
30 partners (higher than any of the other children).  
31  
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33           Some support for this suggestion comes from Monks et al. (2005) who found that  
34 aggressors (ages four- to six-years) obtained lower scores than other children on a range of  
35 theory of mind tests as well as on inhibitory control and planning tasks, although not to a  
36 significant extent. This was in contrast to Sutton et al.'s (1999) study showing that Bullies  
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2 (ages seven- to ten-years) have superior theory of mind skills. However, Coolidge, DenBoer  
3  
4 and Segal (2004) also found links between bullying behaviour and executive function deficits,  
5  
6 including decision-making, planning and organisational problems, and social misjudgements  
7  
8 for 11-15 –year-old adolescents.

9 Perhaps these disparate findings can be reconciled by the results of Kaukiainen et al.  
10  
11 (2002) who found two groups of Bullies in a sample of 11- to 12-year-olds: one ‘socially  
12  
13 unskilled’ group, characterised by learning difficulties and low social intelligence, the other a  
14  
15 ‘socially skilled’ group without learning difficulties and with average social intelligence.

16 The Bullies in our study appear to resemble Kaukiainen et al.’s (2002) first group,  
17  
18 suggesting that they may have inferior theory of mind, inhibitory control and planning skills  
19  
20 comparable to those of Monks et al.’s (2005) sample. This would certainly account for their  
21  
22 poor performance on the task. A study by Ciairano, Visu-Petra, and Settanni (2007)  
23  
24 demonstrating that children’s behaviour on a cooperative puzzle task was linked to executive  
25  
26 inhibitory control lends further support for this interpretation.

### 26 **Non-Role Children**

27 According to their peer nominations, Non-Role children do not consistently adopt a  
28  
29 particular role in bullying situations but may adopt different roles on different occasions. This  
30  
31 would suggest that their behaviour is flexible and influenced by those around them and the  
32  
33 situations in which they find themselves. This appeared to be supported by our findings; Non-  
34  
35 Role children partnered with either a Defender or another Non-Role child behaved similarly to  
36  
37 each other but the Non-Role children partnered with Bullies behaved very differently. It  
38  
39 should be remembered that Bullies and their Non-role partners were matched on verbal ability  
40  
41 (BPVS score) and therefore Non-role children working with Bullies had lower verbal ability  
42  
43 than Non-role children working with either Defenders or other Non-role children. In spite of  
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45 this, they used very high levels of Explanatory-Information Statements, higher than all other  
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47 children. However, they used only moderate levels of Directive-Guidance. It seems puzzling  
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49 on first consideration that, as both these forms of communication are concerned with  
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51 providing explanation and assistance to partners, Bully-partners should use very high levels  
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53 of one (Explanatory-Information) but low levels of the other (Directive-Guidance). When  
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55 seeking to understand this, it may be worth considering Bullies’ probable reputations within  
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1  
2 the peer group. Directive-Guidance, as it involves telling a partner what to do and taking  
3 charge to a certain extent is a rather more assertive communication strategy than use of  
4 Explanatory-Information Statements. Hence Non-role children may well have hesitated to use  
5 this Directive-Guidance strategy with children who are known to bully. At the same time the  
6 apparent over-reliance on Explanatory-Information Statements may well indicate that these  
7 were used in instances where the other dyads would have used a mixture of Directive-  
8 Guidance and Explanatory-Information.  
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14 One of the effects on a Non-Role child of working with a Bully rather than another  
15 child may therefore be a reduced flexibility in the kinds of communication he or she feels able  
16 to use. It is interesting to note also that Bully-partners showed very low levels of agreement  
17 with their partners, compared to Non-Role children working with other children. It is possible  
18 that Bully-partners may have felt cautious about disagreeing outright and were instead using  
19 the more indirect, less assertive strategy of failing to agree. One possible interpretation of  
20 these interactional behaviours was that the Non-Role children were wary of asserting  
21 themselves with Bullies.  
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### 27 **Limitations**

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29 We would express caution about the generalisability of these findings to bullying  
30 behaviour at other ages and in other social situations for a number of reasons:  
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32 1. In order to obtain the sample size required for the dyadic Shopping Task we  
33 needed to interview 142 children individually. Furthermore, supervision of the computer task  
34 and subsequent coding of the videotaped material was labour-intensive. By necessity  
35 therefore, the sample size for the Shopping Task was relatively small consisting of 34 dyads  
36 (68 individuals). Furthermore, we did not manage to recruit any female bullies and were  
37 therefore unable to balance the 3 dyad-types for gender. In spite of this, our study was  
38 sufficiently powered to obtain consistent and statistically significant results and we were able  
39 to control for the effects of gender when exploring factors relating to performance. However,  
40 it would be prudent not to assume very broad generalisability without replication with larger  
41 samples.  
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49 2. We took measures of the children's sociometric popularity and prosocial behaviour.  
50 This provided some data on the characteristics of our sample, but could not be used in the  
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2 analyses relating to verbal communication as dyads were neither matched nor selected for  
3 participation on these criteria, resulting in high intra-dyadic variation on these measures.  
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5 However, bearing in mind the interesting relationships between bullying, popularity and  
6 prosocial behaviour, future research may wish to investigate the interplay of these factors on  
7 communication using samples of greater size than in the present study.  
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11 3. Another consideration to be borne in mind is that we sought to create a situation  
12 that was similar to an everyday interactional context. The extent to which we succeeded in  
13 achieving this is difficult to determine, but it should be remembered that the interaction we  
14 observed was (a) dyadic and (b) composed of researcher-selected children. Findings from  
15 this study may not apply to group interactions or to naturally-occurring dyads.  
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### 19 **Conclusion**

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21 We hoped to shed some light on possible links between communication during  
22 collaborative interactions of children and the roles that they adopt in bullying contexts. To our  
23 knowledge this is not a subject that has been explored before. However, some significant and  
24 interesting findings have emerged that warrant further investigation. Recent bullying  
25 prevention programmes advocate involving the entire peer group rather than focusing  
26 exclusively on children who bully and their victims. One of the aims of this approach is to  
27 undermine the respect and fear that children who bully appear to command. Harach and  
28 Kuczynski (2005) have maintained that relationships are formed from an accumulation of  
29 interactions over time and we have shown that there are significant differences in the  
30 interactions of children even at times when bullying is not taking place. Perhaps then, to deal  
31 with bullying effectively, attention needs to be focused on children's interactions in a variety of  
32 contexts as well as during actual instances of bullying.  
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Table 1.

*Characteristics of Shopping Task participants*

	N	Age (months) <i>M (SD)</i>	Gender	BPVS scores <i>M (SD)</i>	Popularity category	Prosocial scores
Bullies	10	94.70 (3.40)	10 male 0 female	88.30 <sup>b</sup> (1.89)	6 unpoplar 4 average	6.60 <sup>e</sup> (4.22)
Defenders	13	92.85 (4.45)	5 male 8 female	100.85 <sup>a</sup> (7.18)	1 popular 12 average	17.23 <sup>c</sup> (12.44)
Bully- partners	10	90.90 (4.01)	10 male 0 female	91.10 <sup>b</sup> (5.49)	10 average	7.40 <sup>d</sup> (4.40)
Defender- partners	13	92.62 (4.13)	5 male 8 female	101.46 <sup>a</sup> (7.47)	13 average	9.23 (5.96)
Non-role pairs	22	91.77 (3.16)	2 male 9 female	95.14 (7.78)	1 popular 21 average	8.86 <sup>d</sup> (5.63)

Significant differences within columns between superscripts: a and b =  $p < 0.05$ , c and d =  $p < 0.05$ , c and e  $p < 0.01$ .

Table 2.

*Hierarchical Regression Analysis of Variables Predicting Task Performance.*

Predictor	R <sup>2</sup>	F(df)	β	B
I step	0.23	4.59(2, 31)*		
Non-role			5.26	.12
Bully			18.71	.39*
Defender			-23.97	-.53**
Ila step	0.23	3.05(3, 30)*		
Non-role			6.04	.13
Bully			18.28	.40*
Defender			-24.32	-.54**
Age			1.17	.07
Ilb step	0.23	3.00(3, 30)*		
Non-role			3.70	.08
Bully			20.90	.45
Defender			-24.60	-.54**
Gender			4.58	.06
Ilc step	0.23	2.96(3, 30)*		
Non-role			5.26	.12
Bully			18.72	.40
Defender			-23.99	-.5*
BPVS			0.00	.00

\* p < .05, \*\* p < .01. Step Ila  $\Delta R^2 = .013$ , Step Ilb  $\Delta R^2 = .002$ , Step Ilc  $\Delta R^2 = .004$ .

Table 3.

*Verbal Communication Measures by Individual: Frequency of Observations Expressed as a Percentage of Total Number of Thought Units.*

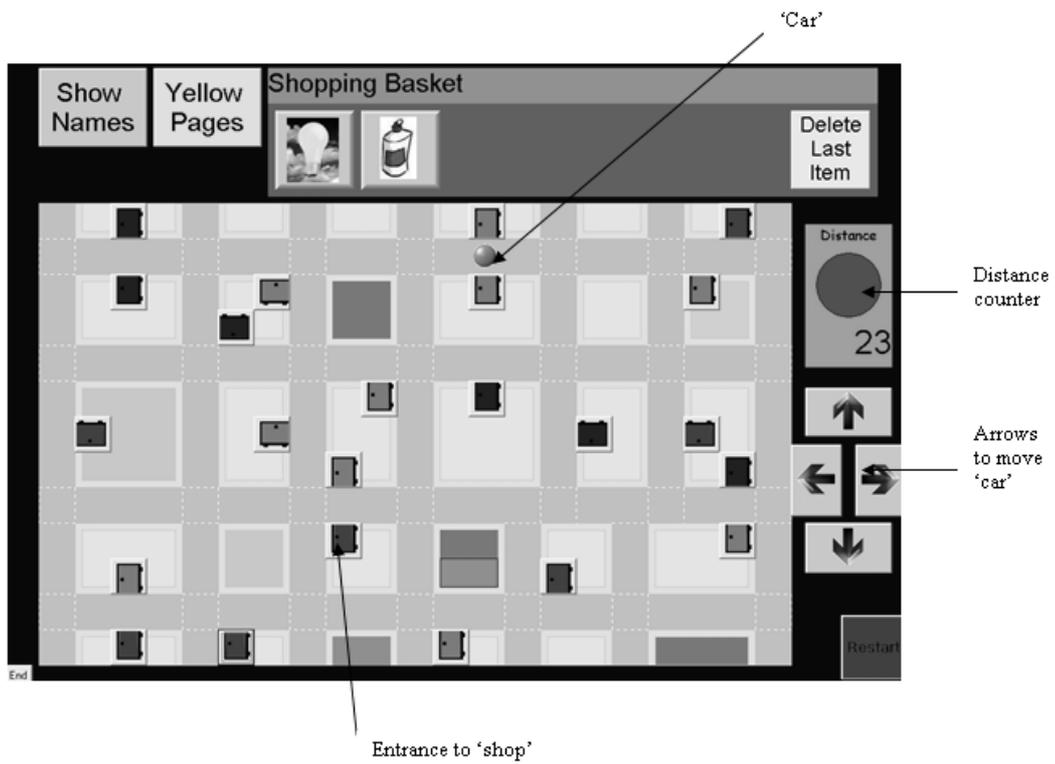
	Non-Role + Non-Role dyad <i>M (SD)</i>	Defender- partners <i>M (SD)</i>	Bully- partners <i>M (SD)</i>	Defenders <i>M (SD)</i>	Bullies <i>M (SD)</i>
Demands	10.31 (4.73)	7.59 (5.95)	10.70 (7.06)	8.18 (4.95)	9.13 (6.25)
Directive- Guidance Information	6.59 (7.59)	7.15 (7.13)	5.38 (4.73)	9.60 <sup>b</sup> (7.45)	3.51 <sup>a</sup> (3.62)
Explanatory- Information Off-Task Talk	15.60 (7.81)	15.10 <sup>d</sup> (6.46)	19.97 <sup>b,c</sup> (6.34)	18.70 <sup>b</sup> (9.24)	10.97 <sup>a</sup> (5.81)
Questions	3.44 (3.88)	1.84 (3.54)	5.68 (10.06)	2.07 (4.91)	7.47 (9.85)
Agreements (total)	13.75 (6.96)	13.36 (5.78)	12.50 (8.38)	13.21 (6.63)	12.91 (3.58)
Agreements- Action Agreements -	6.75 <sup>a</sup> (3.08)	8.64 <sup>e</sup> (4.84)	3.69 <sup>b,f</sup> (2.79)	7.08 (3.07)	8.15 <sup>a</sup> (4.49)
Facts Disagreements (total)	2.33 <sup>a</sup> (1.69)	4.23 <sup>g</sup> (3.43)	0.75 <sup>b,h</sup> (0.86)	3.71 (3.14)	2.92 <sup>a</sup> (2.85)
Disagreements- Action Disagreements-	4.42 (2.68)	4.42 <sup>e</sup> (2.57)	2.94 <sup>b,f</sup> (2.07)	3.37 (2.81)	5.23 <sup>a</sup> (2.78)
Facts Disagreements (total)	4.13 (3.16)	3.30 (2.57)	4.58 (3.93)	2.30 <sup>h</sup> (1.68)	6.38 <sup>g</sup> (6.64)
Disagreements- Action Disagreements-	2.09 (1.97)	1.15 (1.78)	1.41 (1.62)	1.11 (1.14)	1.84 (2.60)
Facts N	2.04 (1.95)	1.80 (1.58)	3.16 (3.08)	1.20 <sup>h</sup> (1.12)	4.54 <sup>g</sup> (2.28)
	22	13	10	13	10

Information includes Explanatory-Information statements. Significant differences within rows between superscripts: a and b =  $p < .05$ , c and d =  $p < .05$ , e and f =  $p < .01$ , g and h =  $p < .001$ .

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*Figure 1. Computerised Version of the Shopping Task*

Figure 1 - Computerised version of the 'Shopping Task'.



## Appendix 1

*Coding System for Computerised Shopping Task*

<b>PRIMARY VERBAL CODES</b>	<b>EXAMPLES</b>
<b>Demands</b>	
Directives	You do that Let me have my turn now, please?
Directive-Guidance (sub-category). Guidance and direction specifically for the partner whilst using the mouse.	Go left, now up, up, go in there.
<b>You and Me statements</b>	We're both in the same class
<b>Information exchange</b>	
Information. Factual statements, not expressing feeling, not covered by above categories.	The grocery store's got apples I dunno
Explanatory-Information (sub-category of Information). Task monitoring, task organisation, explanation concerned with carrying out the task. Not expressing feeling.	Got to get the last item now, nearly finished. 52, too much (referring to counter in game).
<b>Feeling Statements</b>	
Positive feeling, self-focused	I like this game, it's cool
Negative feeling, self-focused	I'm getting bored doing this
Positive feeling, other-focused	Great! You're doing it right.
Negative feeling, other-focused	You're stupid
<b>Off-Task Talk</b>	
Off-task talk.	I'm going swimming tomorrow

<b>Questions</b>	
Question for information	What does this one do?
Request for repetition	What?
Question for agreement (tag question)	Right?
<b>Agreements and disagreements (First coding)</b>	
Agreement-Action - agree to act, comply to a demand	OK, you can have the next go.
Agreement-Fact - agree to a matter of fact	Yes, you're right, it is in there.
Disagreement-Action – disagreeing to take action, refusal to comply a demand	No, you can't have the next go. I'm not going to the jewellery shop
Disagreement-Fact, disagreement about a matter of fact.	It isn't in that shop, it's in the other one
<b>Disagreements (Second coding)</b>	
Discussed Disagreement	You can't, you have to find it first, then you can do that bit
Non-Discussed Disagreement	No I'm not doing it