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TITLE

Learning to collaborate: Can young children develop better communication strategies through collaboration with a more popular peer

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ABSTRACT

Unpopular children are known to have poor communication skills and experience difficulty in collaborative situations. This study investigated whether pairing unpopular, 5 to 6 year-old, children with a more popular peer would promote more effective collaboration. The study also investigated differences in popular and unpopular children's verbal and non-verbal communication. Thirty-six girls and 36 boys were placed in one of 12 popular, 12 unpopular or 12 mixed pairs. There were no mixed gender pairs. Children were filmed playing a collaborative game. Collaboration in popular pairs was more successful and less disputational than in unpopular pairs. Boys in unpopular pairs broke the rules of the game more often, argued more and did not monitoring their partners' facial expressions effectively. With popular partners they argued less, were more likely to elaborate disagreements, looked at their partner for longer, smiled more and were more likely to offer him a small toy. Unpopular girls interactions were not markedly disruptive but they clearly benefited from being paired with a child with good communication skills. Popular girls modified their behaviour to take into account an unpopular partner's need for support. These findings suggest that pairing popular and unpopular children may be a useful classroom organisation strategy.

RUNNING HEAD

Popular and Unpopular Children's Collaboration

KEY WORDS

Collaborative Learning, Popularity, Children, Gender

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Abstract

Unpopular children are known to have poor communication skills and experience difficulty in collaborative situations. This study investigated whether pairing unpopular, 5 to 6 year-old, children with a more popular peer would promote more effective collaboration. The study also investigated differences in popular and unpopular children's verbal and non-verbal communication. Thirty-six girls and 36 boys were placed in one of 12 popular, 12 unpopular or 12 mixed pairs. There were no mixed gender pairs. Children were filmed playing a collaborative game. Collaboration in popular pairs was more successful and less disputational than in unpopular pairs. Boys in unpopular pairs broke the rules of the game more often, argued more and did not monitoring their partners' facial expressions effectively. With popular partners they argued less, were more likely to elaborate disagreements, looked at their partner for longer, smiled more and were more likely to offer him a small toy. Unpopular girls interactions were not markedly disruptive but they clearly benefited from being paired with a child with good communication skills. Popular girls modified their behaviour to take into account an unpopular partner's need for support. These findings suggest that pairing popular and unpopular children may be a useful classroom organisation strategy.

Key Words: Collaborative Learning, Popularity, Children, Gender

Introduction

While it is now well established that collaborative learning can enhance children's cognitive performance (e.g. Blaye, Light, Joiner and Sheldon, 1991, Kutnick and Rogers, 1994), consideration of the influence of individual differences in children's popularity, communicative skills and social competencies on collaborative learning exchanges has been paid scant attention. As peer interaction does not always proceed smoothly systematic investigation of how these factors influence collaborative learning seems warranted. For example, unsuccessful collaboration has been associated with poor social and communicative skills as Light and Glachan (1985) have shown. They found that when pairs of children worked together on a collaborative learning task successful pairs remained on task and resolved disagreements through reasoned argument. In unsuccessful pairs, by contrast, disagreements resulted in one or both of the children attempting to defend their 'status' by raising their voices, claiming to know what was right or just pressing ahead despite their partner's protests. These findings suggest that children need a command of particular social and communicative skills to form effective working relationships.

These findings also indicate that even when children are grouped according to age, ability or gender it can not be assumed that they will all be equally skilled in managing the interpersonal dynamics of interactive learning situations. Whether these skills are acquired naturally over the course of development or whether they have to be deliberately fostered through social skills training programmes has been a matter for debate in the research community, (e.g. Kutnick and Manson, 1998). Kutnick (1997), for example, found that teaching social skills to a class of nine-to-ten year-old children significantly improved the quality of their social interaction and subsequent performance on collaborative tasks.

Popularity has also been implicated as a factor that influences whether a child will be able to engage successfully in informal collaborations such as cooperative play. As well as being less well liked by their peers, less popular children have been shown to lack some of the skills necessary for effective collaboration. Black and her colleagues compared popular and unpopular three-to-five year-olds' performance in cooperative play situations, (e.g. Black & Hazen , 1990; Black, 1992; Black & Logan, 1995; Kemple, Speranza & Hazen, 1992). They demonstrated that even at this young age, unpopular children used less effective methods of verbal communication than popular children. Similarly, in an investigation of paired problem solving, Markell and Asher (1984) found that amongst nine year-olds, unpopular children were less

likely to influence their partner's decision making strategies than popular children. In challenging situations, popular children adopt more effective strategies to resolve disputes than unpopular children, (Underwood, 1993). In general the literature on popularity and friendship shows that popular children are more socially skilled and communicate with each other more effectively than their less popular peers, (e.g. Azmitia, 1996, Hartup, 1996).

Given these findings it is reasonable to suppose that when children participate in collaborative learning exchanges the relative popularity of each member of the group or pair will influence the success or otherwise of their joint collaborative effort. As Littleton and Hakkinen (1999) argue, there is a real need to understand, at a micro-developmental level, the social and interpersonal processes taking place when pairs or groups of children interact in collaborative play and learning contexts. The study reported in this paper was designed to investigate how popularity impacts on these processes. It compares, in some detail, the verbal and non-verbal social and communicative processes observed to take place between pairs of popular and unpopular, five-to-six year-old children playing a game requiring considerable collaboration.

Two questions were investigated: Firstly, are there significant differences in the way in which pairs of popular and unpopular children interact in a collaborative situation? Secondly, does unpopular children's behaviour differ depending on the type of partner, (popular, unpopular) they are paired with?

There is little available research on the first question. Despite the growing recognition of the importance of social skills on collaboration, (e.g. Azmitia 1996, Durkin 1995), only one study, Markell and Asher, (1984), has investigated how popularity influences children's performance in a collaborative learning context. They found that compared to more popular peers, unpopular children aged nine-to-ten years were more likely to violate the rules of the task. They were also more submissive, participated less overall and had less influence over their partners.

There is even less information on the second question. Previous studies have not investigated whether there are any measurable social or cognitive effects of pairing popular and unpopular children. This is an important question as children rarely have any direct choice of who they work with in classroom learning contexts. They must often have to attempt to work collaboratively with peers who in other contexts, such as the playground, they would not choose to interact with.

To investigate these questions single gender pairs of two popular children, two unpopular children or one popular and one unpopular child were videoed playing a game designed to test their social and communicative abilities. It also tested collaboration by observing how well they kept to a set of rules in the absence of an adult and whether they could act in a 'prosocial' manner, (i.e. deciding whether to keep a small toy for themselves or offer it to their partner). Rabiner and Gordon (1992) report that unpopular boys have greater difficulties resolving this type of conflict than popular boys.

Children's conversation was analysed using measures derived from existing research on collaboration. Asking questions, using directives and reminders have been found to be important to successful collaboration.,(Azmitia, 1988, Barron & Foot,1991) as have the nature of children's agreements and disagreements. Kruger (1993), for example, reported favourable learning outcomes for pairs who elaborate and extend each other's statements and questions. Unelaborated verbal conflict, by contrast, has been shown to be detrimental, (Azmitia, 1996; Light & Glachan, 1985).

Non-verbal communication is also an important feature of any interactive situation, yet this has seldom been taken into account in studies of children's collaboration. For this reason two indicators of non-verbal interaction, (gaze use and facial expression) were also measured. These measures were adopted as unpopular children are less likely than popular children to identify facial expressions correctly, (Denham et al., 1990; Nowicki & Duke, 1992; Philippot & Feldman, 1990; Walden & Field, 1990). Very little is known, however, about how popular and unpopular children use gaze to monitor changes in a partner's facial expression during interaction. The research on facial expression indicates that when popular children monitor others' facial expressions they should be more likely to identify these correctly and respond appropriately than less popular children.

On the basis of the findings reported above it was predicted that where both children were popular collaboration would be more effective, children would be more likely to observe the rules of the game and more likely to offer toys to each other. Next it was predicted that popular children would show greater use of verbal elaboration, questions, directives and rule reminders. In terms of non-verbal interaction it was predicted that popular children would look at their partner more, smile more and show fewer frowns and down-turned mouth expressions.

It is not clear from existing research how popular children might be affected by being paired with a less popular partner. On the one hand there may be no effects at all. At this young age popular children may not have developed sufficient social sensibility to tailor their social interactions appropriately for different partners. Alternatively, they may well be highly sensitive to the needs of other children, and one would predict differences in the ways in which popular children interact with each other compared to the ways in which they interact with less popular children. Finally, popular children may find working with a 'low status' partner difficult or unpleasant with consequent disruption to the interaction. Conversely, unpopular children might behave differently with a 'high status' partner compared with how they interact with an partner of more equal status.

Existing research, (e.g. Azmiltia, 1988, Markell and Asher,1984, Wood,Wood, Ainsworth, and O'Malley,1995) suggests four potential outcomes of pairing unpopular children with popular children. Firstly, and arguably most importantly, unpopular children may learn useful social and communicative skills by observing and modeling more popular children. Secondly the more socially skilled member of the pair might naturally scaffold the less skilled child. A third outcome might be that the performance of unpopular children improves because interacting with popular is a more positive experience.

Finally, it is possible that status and/or gender differences between popular and unpopular children might influence the unpopular children's ability to collaborate. As popular children enjoy higher status among their peers, (Coie, Dodge & Coppotelli, 1982) unpopular children might try harder to please the more popular child. Alternatively they might experience the status differential as intimidating or stressful and be more withdrawn or negative. As boys' peer relations are known to be more hierarchical than girls',(Daniels-Bierness,1989), issues of status and dominance may affect boys and girls differently.

Method

Design

The experiment was a 3 x 2 between-subjects design with Pair type (Popular, Unpopular, Mixed) and Gender as the independent variables. The dependent measures are described below.

Participants

Participants were four-to-six year old children attending six different primary schools in Hertfordshire, U.K.. Prior to testing, 257 children from nine classes completed an individual, confidential, sociometric interview. Denham et al.'s (1990) peer-rating scale and Newcombe and Bukowski's (1983) friendship nomination technique were used to determine the sociomentric makeup of each class. Only children classed as popular or unpopular on both sociometric measures were selected to participate in this study. Children's popularity status was treated as strictly confidential. Detailed consideration of the ethical implications of sociometric testing procedures is given in Murphy, (1999).

Seventy two children, half with high popularity ratings and half with low popularity ratings were selected. Twelve pairs of popular children, 12 pairs of unpopular children and 12 popular/unpopular pairs were formed. Children were always paired with a classmate. There were no mixed-gender pairs. Number of boy/boy and girl/girl pairs was equal for each type of popularity pairing.

Materials and procedure

Each pair was invited to play a game. Children were each given a teddy bear and a large 'feely' bag containing some small attractive toys and some less attractive objects. They were instructed to take turns to feel something in the bag and, without looking or taking it out, describe how it felt to their partner who had to decide, on the basis of this description only, whether to keep the object for their own teddy or give it to their partner's teddy. The first child then placed the object in a box 'belonging' to the designated teddy bear. The other child then took his/her turn. Children had five objects each and took turns until both bags were empty. The child whose teddy had acquired the most objects effectively 'won' the game. It took about ten minutes to play.

Children were instructed to observe the following rules: (i) take turns; (ii) do not look in the bag; (iii) do not take an object out of the bag until your partner has decided

which teddy it should go to; (iv) do not change your mind once you see the object. The latter two rules were designed to produce a potential conflict of interest as children had no way of knowing how 'desirable' the object was until it was revealed.

To make sure that children fully understood the instructions, the researcher practiced the game with each child first. All sessions were videotaped and took place in the children's own classroom or in a nearby area where they were used to working.

Dependent Measures

Cooperative and non-cooperative behaviour

Offers.

Whether or not children behaved in a cooperative, 'pro-social' manner was observed by noting the number of times they offered the unseen object to their partner's teddy.

Rule violations.

Rule violations were taken to indicate instances of non-cooperation, (e.g. snatching or keeping an object when the rules stated that it should go to one's partner's teddy; pulling objects straight out of the bag without giving a description; looking in the bag; refusing to take an object when the rules state that one should).

Verbal communication measures

The entire task interaction from start to finish (usually about ten minutes for each pair) was used to code children's verbal utterances as follows.

Directives.

Any utterance where one child told another what to do, (e.g. 'Please can I have it', 'Say me', 'Give it to me', 'It's your turn').

Rule reminders.

Utterances where a child reminded his/her partner of the rules of the game, (e.g. 'No, you mustn't look', 'It's my turn').

Disagreements.

All instances where a child indicated that he/she disagreed with his/her partner, (e.g. 'No'; 'I'ts mine'; 'That's not right').

Elaborated Disagreements.

Where a child attempted to justify or explain a disagreement with his/her partner, (e.g. 'No, that's not fair'; 'I should have it, you had it last time'; 'You're wrong, that's not what the rule says').

Questions.

Any question addressed to a partner,(e.g. 'What did you say'?, 'What do we do next'?);

Non-verbal communication measures

Two minute samples were taken from the videos and used to measure facial expression and gaze. The samples were selected to be neither the first two nor the last two turns of the game, to be times when the children's faces were clearly in view and, if possible, to include at least one episode of conflict.

Facial expression**.**

Izard's (1995) MAX coding system was used to analyse facial expression. Raised brows, mild frown, smile and down-turned mouth were measured as pilot testing indicated that these were the most frequent facial expressions displayed. They indicate interest/surprise, interest, joy and sadness respectively. Coding was carried out by the first author after she had trained on MAX. Ten percent of the videos were also coded by an independent researcher experienced in using MAX. Inter-rater reliability was greater than 80% for all codes used.

Gaze.

Using the same two minute samples, the total amount of time each child spent gazing at the partner's face was measured in seconds. The number of times children used gaze to monitor their partner's facial expressions was also measured and compared to the number of occasions where the child did not look at, or appear to notice, his/her partner's expression.

Results

Where measures could be shown to be continuous and normally distributed, results were analysed according to 3 x 2 ANOVAs with Pair Type (Popular, Mixed. Unpopular) and Gender as the between participant variables. Non-parametric tests (Kruskal-Wallis H and Mann-Whitney U) were used where data violated the assumptions for parametric tests. Chi-square tests were used for categorical data.

Cooperative and non-cooperative behaviours

Offers.

There were no overall significant differences between the mean number of offers made to partner by children in the different pair types (see Table 1a). Although none of the differences was significant, Table 1a shows that boys in Unpopular pairs were less likely to offer the toy to their partner than girls in Unpopular pairs. The latter, however, were most likely of all the children to offer the toy to their partner's teddy. There was, however, a significant difference between the mean number of offers made by unpopular boys in Mixed pairs, compared with boys in Unpopular pairs. Unpopular boys made significantly more offers to a more popular partner ($\underline{M} = 2.50$) than to an unpopular partner ($\underline{M} = 0.58$), ($\underline{U}=8$, $\underline{p}=0.009$). By contrast, there was no significant difference in the number of offers made by unpopular girls to a popular partner ($\underline{M} = 1.50$) compared with those made to an unpopular partner, ($\underline{M} = 2.08$). Popular children made the approximately the same number of offers to a popular partner ($\underline{M} = 1.21$) as they did to an unpopular partner ($\underline{M} = 1.45$). This can be seen by comparing Tables 1a and 1b.

Insert Tables 1a and 1b about here

Rule Violations.

Overall, children in Popular pairs violated the rules less often than children in Mixed or Unpopular pairs ($\underline{H} = 7.08$, $\underline{df} = 2$, $\underline{p} = 0.02$). Comparisons according to gender, however, showed that this difference was not significant for boys (see Table 2a). Girls in Unpopular pairs and Mixed pairs, however, made significantly more rule violations than girls in Popular pairs ($\underline{U}=33$, p=0.02). Pairs of popular girls were least likely to violate rules in comparison with all other pairs. A comparison the overall means for Unpopular pairs in Tables 2a and 2b shows that when unpopular children were paired with a popular partner both boys and girls were more likely to break the rules than two unpopular children paired together, ($\underline{M} = 3.33$ and 2.71 respectively), although this difference was not significant.

Insert Tables 2a and 2b about here

Verbal communication measures

Chi-square analyses were conducted separately for each verbal communication category. Where Chi-square was significant, individual cell chi-squares were inspected to determine where there were large differences between observed and expected frequencies. The analyses for Directives and Questions showed no significant differences according to either Pair Type or Gender and will not be reported further.

Rule Reminders.

Chi-square analysis revealed a significant relationship between Popularity and Gender ($\chi^2 = 6.54$, $\underline{df} = 2$, $\underline{p} = 0.038$). Inspection of individual cell chi-squares and values for observed and expected frequencies showed that for both boys and girls in unpopular pairs, the frequency of rule reminders was greater than expected. Girls in mixed pairs also showed more than the expected number of rule reminders whereas boys in these pairs showed fewer than the expected number of reminders, (see Table 3).

Insert Table 3 about here

Separate analyses were carried out for boys and girls to compare how they behaved in Mixed versus Same pairs, (i.e. pairs where both children were either popular or both were unpopular). Both analyses showed a significant relationship between Popularity and composition of pair (Same/Mixed). The analysis for the boys ($\chi^2 = 15.41$, $\underline{df} = 1$, $\underline{p} < .0001$) showed that unpopular boys used a greater than expected number of rule reminders when partnered by another unpopular boy ($\underline{f} = 58.0$, $\underline{f_e} = 49.5$). When paired with a popular boy, however, they used fewer rule reminders than expected, ($\underline{f} = 7.0$, $\underline{f_e} = 16.1$). Similarly, popular boys paired with an unpopular partner used more than the expected number of reminders, ($\underline{f} = 22.0$, $\underline{f_e} = 12.9$). compared with when they were paired with a popular partner, ($\underline{f} = 30.0$, $\underline{f_e} = 39.11$), although, overall they used fewer reminders with an unpopular partner.

The analysis for girls also revealed a significant relationship between popularity and type of partner, ($\chi^2 = 16.49$, $\underline{df} = 1$, $\underline{p} < .0001$). Unpopular girls used a greater than expected number of rule reminders (($\underline{f} = 45.0$, $\underline{f_e} = 33.9$) when paired with another unpopular girl, but gave fewer than the expected number of reminders when paired with a popular partner, ($\underline{f} = 10.0$, $\underline{f_e} = 21.1$). By contrast popular girls issued more reminders than expected with an unpopular partner, (($\underline{f} = 39.0$, $\underline{f_e} = 27.9$), but gave fewer than expected when their partner was popular, (($\underline{f} = 34.0$, $\underline{f_e} = 45.1$).

    <u>Disagreements.</u>

Analysis of the total number of disagreements showed a significant relationship between Pair type and Gender, ($\chi^2 = 20.38$, $\underline{df} = 2$, $\underline{p} < .0001$). Boys in Unpopular pairs showed a greater than expected number of disagreements, whereas unpopular girl pairs showed fewer than expected, (see Table 4). By contrast, girls in mixed pairs disagreed with each other more than expected, and boys less than expected, Unpopular boy pairs showed the greatest incidence of disagreements and unpopular girl pairs the least. Both boys and girls in mixed pairs had more disagreements than those in popular pairs, (see Table 4). Within mixed pairs, however, there was no difference between observed and expected disagreements for popular and unpopular children.

Insert Table 4 about here

    <u>Elaborated disagreements</u>.

As explained above, children who elaborate their disagreements are considered better at communication than those who do not. Therefore comparisons were made of the percentage of the total number of disagreements which were elaborated (see Table 5a).
Analysis of this data demonstrated a significant relationship between Pair Type and Gender ($\chi^2 = 10.45$, $\underline{df} = 2$, $\underline{p} = 0.005$). The girls in mixed pairs showed a much higher than expected percentage of elaborated disagreements, ($\underline{f} = 73\%$, $\underline{f_e} = 59\%$). Boys in mixed pairs, however, showed a lower that expected percentage of elaborated disagreements, ($\underline{f} = 44\%$, $\underline{f_e} = 57\%$). Table 5a also shows that the percentage of elaborated disagreements was much lower for children in unpopular pairs compared with mixed or popular pairs, although not lower than expected.

Insert Tables 5a and 5b about here

Within mixed pairs the distribution of elaborated disagreements did not depart from the expected distribution for either boys or girls. Comparison of Tables 5a and 5b shows, however, that when popular girls were paired with an unpopular partner 85% of their disagreements were elaborated compared to only 48% when paired with a popular partner. Similarly, when unpopular girls were paired with a popular girl they elaborated 57% of their disagreements compared with only 27% when with an unpopular partner. Popular boys elaborated fewer disagreements with an unpopular partner (48%) than when with a popular partner (62%), whereas unpopular boys elaborated their disagreements slightly more with a popular partner (45%) than when with an unpopular partner (37%). This suggests that unpopular children, especially girls, were more likely to elaborate their disagreements when paired with a popular child.

Non-verbal interaction measures

Facial expression .

Table 7 illustrates the total number and distribution of facial expressions observed for children in the three Pair Types. While the total number of expressions observed was approximately equal for each Pair Type, analysis of the distribution of different types of expression was significant (χ^2 = 25.28, df 6, p = .0003). Individual cell chi-square values indicated that popular children showed a greater than expected number of smiles than other children, ($\underline{f}$ = 233, $\underline{f_e}$ = 211, χ^2 = 2.22), and fewer down-turned mouth expressions, ($\underline{f}$ = 37, $\underline{f_e}$ = 63, χ^2 = 10.83). Children in Mixed pairs showed a greater than expected number of down-turned mouth expressions, ($\underline{f}$ = 89, $\underline{f_e}$ = 69, χ^2 = 5.81), and children in Unpopular pairs frowned slightly more than expected, ($\underline{f}$ = 36, $\underline{f_e}$ = 28, χ^2 = 1.85). For all children smiling was the most frequently observed facial expression, however, as can be seen from the percentages expressed in Table 7.

Insert Table 7 about here

Separate analyses were conducted for boys and girls. A significant Chi- square for the boys data (χ^2 = 39.50, df 6, p <.001) mirrored the above findings. Popular boys showed more smiles and fewer down-turned mouth expressions than expected, (f = 116, fe = 91, χ^2 = 7.08 and f = 12, fe = 34, χ^2 = 14.14 respectively), whereas unpopular boys showed fewer smiles (f = 88, fe = 113, χ^2 = 5.876) and more down-turned mouths than expected, (f = 55, fe = 42, χ^2 = 3.63). This suggests that the interaction was less positive for unpopular boys than it was for other children. Chi-square analysis for girls was also significant, (χ^2 = 16.04, df 6, p =.0136) but showed a different pattern. Girls in popular pairs indicated more interest and surprise (raised brows) than expected, (f = 33, fe = 24, χ^2 = 2.65) whereas unpopular girl pairs showed less interest, (f = 17, fe = 26, χ^2 = 2.95). As in the previous analyses girls in Mixed pairs showed more down-turned mouth expressions ((f =39, fe =28, χ^2 =3.61).

As cell frequencies in some categories were below 5, no statistical analyses were performed on data from mixed pairs. Unpopular boys in mixed pairs frowned less, (3% of total number of expressions) and smiled more when with a popular partner (56% of total), however, than when with an unpopular partner (9% and 41% respectively). Unpopular girls, by contrast smiled less (58%) and showed slightly more down-turned mouth expressions (18%) with a popular partner than when paired with another unpopular girl (71% smiles and 11% of down-turned mouths).

Use of Gaze

Amount of time spent gazing at partner.

The mean number of seconds that children gazed at partner in two minute sample of interaction was 36.94 for Popular pairs, 32.43 for Mixed pairs and 26.04 for Unpopular pairs. These differences were significant, (F = 4.093, df 2,76, p=0.02). Bonferroni/Dunn post hoc analyses showed, however, that this was only true for the difference between Mixed and Unpopular pairs (p<0.06) and Popular and Unpopular pairs (p=0.006). A comparison of the difference between unpopular children in Mixed pairs compared with those in Unpopular pairs showed that when paired with a popular boy, unpopular boys used significantly more gaze than when paired with another unpopular boy, (M = 29.2 and 22.2 seconds respectively, t = 2.47, df =17 p<0.05,). For unpopular girls this difference was non-significant. No other comparisons were significant. This finding supports the hypothesis that unpopular children's use of gaze may improve if paired with a popular child but only for boys.

Use of gaze to monitor partner's facial expression.

The number of times children looked at their partner's face as the partner was using a facial expression was counted as was the number of occasions that they did not gaze at their partner when he/he was using a particular expression. Table 7a shows that children in Popular pairs looked at their partners on significantly more occasions than those in Mixed or Unpopular pairs, (χ^2= 15.46, $\underline{df}$ = 6, $\underline{p}$ = 0.017). This pattern was the same for both boys and girls although for all pair types girls noticed more of their partner's facial expressions than boys. On average boys looked at 58 percent of their partners' facial expressions whereas girls saw 76 percent of their partners' expressions. Popular children were less likely to notice down-turned mouth expressions, ($\underline{f}$ = 25, $\underline{fe}$ = 38, χ^2 = 4.66), whereas children in Mixed pairs noticed these more often than expected ($\underline{f}$ = 49, $\underline{fe}$ = 36, χ^2 = 4.59). Unpopular children noticed frowns more often than expected by chance (($\underline{f}$ = 21, $\underline{fe}$ = 15, χ^2 = 2.10). It is worth noting however that these forms of expression were relatively infrequent in comparison to the incidence of smiles. No significant differences were found between any of the pairs for monitoring of smiles. This and the overall incidence of smiling suggests that smiles are a highly salient non-verbal communication device for all children of this age regardless of gender and/or popularity.

Insert Tables 7a and 7b about here

Comparison of the behaviour of children in Mixed pairs (see Table 7b) showed that even though popular and unpopular children gazed at each other for an equivalent length of time, unpopular children only noticed 50 percent of their partners'expressions whereas the popular member of the pair noticed 69.7 percent of his/her partner's expressions. A comparison of Tables 7a and 7b shows that popular children in mixed pairs did not monitor and unpopular child to any greater extent than popular children monitored each other. Unpopular children in mixed pairs, by contrast, tended to monitor their popular partner's facial expressions less often than children in Unpopular pairs. Cell frequencies were too low in some cells for meaningful analyses of differences between boys and girls in Mixed pairs.

Discussion

The discussion addresses the first question investigated by this study, that is whether popular children do in fact perform differently to unpopular children in an interactive situation and then examines the second related question of whether unpopular children can learn social and communicative skills from interacting with popular children.

Differences between popular and unpopular children

When playing a game requiring considerable collaboration popular children managed the interaction more successfully in the sense that they were less likely to break the rules than unpopular children. Unpopular children appeared to have difficulty with observing the rules of the game and issued many more rule reminders to each other, particularly if they were boys. This result confirms Markell and Asher's (1984) finding that unpopular children have more difficulty following rules in the absence of an adult. The findings reported here extend Mrakell and Asher's study, however, as they show that this difficulty is greater for unpopular boys compared with unpopular girls. Popular children were also found to use more effective verbal and non-verbal communication strategies. They had fewer disagreements over all and were more likely to elaborate their disagreements than unpopular children. Unpopular boys had a great many disagreements, over two thirds of which were unelaborated. Children in Popular pairs were found to gaze at their partners for longer than other children and appeared to be more efficient at monitoring their partners' facial expressions than less popular children. The non-verbal messages they conveyed to their partner were also different. They smiled more and were less likely to show down-turned mouth expressions. Unpopular children also smiled a lot when with an unpopular partner but showed twice as many down-turned mouth expressions than popular children suggesting that they experienced more sadness.

Overall then it can be concluded that when collaborating in a game playing situation popular children manage the social dynamics of the situation better, show superior social and communicative skills and more enjoyment in the game than unpopular children. The gender differences observed also show that unpopular boys have particular difficulties with managing collaborative social interactions of this nature.

<u>Interactions between popular and unpopular children</u>

As outlined in the Introduction, it would benefit the design of social skills training interventions if it could be demonstrated that less skilled children can learn social skills through planned interaction with more-skilled children. In this study, therefore, popular children were paired with a less popular child to investigate whether their observed behaviours differed from those of children paired with a partner of equal status. There were two main questions here. Firstly, do unpopular children behave differently when interacting with a popular as opposed to an unpopular child? Equally importantly, do popular children modify their behaviour when with an unpopular partner to take account of possible differences in the latter's social skills?

When an unpopular child played with a popular child they were just as likely to break the rules than when with another unpopular child. With respect to other aspects of the interaction, however, the picture is different for boys and girls. Unpopular girls with popular partners did use a significantly higher proportion of elaborated disagreements (57%) with a popular partner compared to their interactions with an unpopular partner (27%), although overall unpopular girls had the lowest number of disagreements of all other children in the study. As their popular partners showed a much greater incidence of elaborated disagreements (73%) than when with a partner of equal status (48%) it seems reasonable to suggest that unpopular girls may have benefited from this example.

Unpopular boys also elaborated their disagreement more with a popular partner, but this increase was not nearly so marked as it was for unpopular girls. Unpopular boys with popular partners did show a number of significant changes in behaviour compared to when partnered with boy of equal status. They looked more at a popular partner, although with the exception of raised eyebrow expressions, they were less likely to notice changes in his expression. When in Mixed pairs they were more likely to display more prosocial behaviour such as offering toys to the popular boy of the pair. Finally, they were less likely to use rule reminders with a popular boy or experience as many disagreements than two unpopular boys together.

The only difference to behaviour between popular children in Mixed pairs compared to those in Popular pairs was in respect of the proportion of elaborated to non-elaborated disagreements. As noted above popular girls with unpopular partners used a significantly higher proportion of these while popular boys used a significantly lower proportion.

The results found here show that unpopular children may learn useful communicative skills from interacting with more popular children but that the experience is very different for boys and girls.

Outcomes of pairing popular and unpopular children

Four possible outcomes of pairing popular and unpopular children were discussed earlier. The first was that unpopular children would learn skills from the popular children by observation and modelling. The second possible outcome was that the popular children would provide help and guidance for the unpopular children. The third was that unpopular children might perform better with a popular child because the interaction would be more pleasant. Finally possible status differences between popular and unpopular children might influence the interaction differently for boys and girls.

The finding that popular girls elaborated their disagreements more with an unpopular partner, strongly suggests that they provide a good model of how a successful communicator behaves. Further evidence of this comes from their use of rule reminders; popular girls used a very high number of these with unpopular partners indicating that they were trying to instruct the unpopular girls in how to keep to the rules, an aspect of the game that unpopular children had problems with. The findings also suggest that popular girls may be more sensitive to non-verbal expressions of feelings than the other children. The popular girls saw significantly more of their partners' down-turned mouth expression in Mixed pairs than the other children. This could not be explained by greater use of gaze as in the Mixed pairs there was no difference in the amount of gaze used by popular and unpopular girls. These findings are consistent with previous studies showing that popular chidren have less difficulty recognising certain facial expressions than unpopular children. (Denham et al., 1990; Nowicki & Duke, 1992; Philippot & Feldman, 1990; Spence, 1987; Walden & Field, 1990). These studies also report that unpopular children generally do not have difficulties with expressions of happiness but confuse expressions of sadness and anger. The findings here replicate these earlier findings: There were no differences in the number of smiles seen by popular and unpopular children.

There was no evidence to suggest that popular boys tried to give their unpopular partners any assistance with the game. In fact, they actually used a significantly lower proportion of elaborated to unelaborated disagreements than boys

in Popular pairs. This could indicate that, contrary to popular girls, their own social skills might be adversely affected by interaction with an unpopular, lower status, partner. Other than this however, popular boys with unpopular partners acted very similarly to popular boys with popular partners. This is in strong contrast to the behaviour of the unpopular boys whose behaviour appears to change significantly when with a popular partner. The nature of these changes suggests that they wish to please popular boy partners. They offer them toys more readily, are less likely to argue and less likely to use rule reminders. They also use more gaze or look longer at a popular partner. The differences in behaviour shown by the unpopular boys is consistent with an explanation which suggests that they are highly responsive to perceived status differences between popular and unpopular boys. This appears to result in less disputational and more prosocial behaviour indicating that pairing a low status boy with a high status boy is advantageous for the former.

In conclusion the findings reported here indicate that unpopular children as young as five years of age benefit from being paired with a popular partner and that, one way or another, they appear to be learning better ways of managing collaborative interactions. Unpopular girls find an excellent model in a more popular partner. There is evidence that this more popular partner makes some effort to tutor the less skilled girl in elements of successful verbal and non-verbal communication. Unpopular boys' behaviour appears to improve by virtue of their desire to please, or be accepted, by a more popular, high status partner. Popular children in Mixed pairs do not appear to find managing the interaction significantly more difficult or unpleasant which suggests that forming mixed popularity, working pairs may be one of a range of classroom organization strategies to help less popular children learn to collaborate.

References

Azmitia, M. (1988). Peer interaction and problem-solving: When are two heads better than one? Child Development, 59, 87-96.

Azmitia, M. (1996). Peer interactive minds: developmental, theoretical and methodological issues. In P. Baltes & U. Staudinger (Eds.), Interactive minds: Life-span perspectives on the social foundations of cognition, Cambridge, UK: Cambridge University Press.

Barron, A., & Foot, H. (1991). Peer tutoring and tutor training. Educational Research, 33(3), 174-185.

Black, B. (1992). Negotiating social pretend play: communicating differences related to social status and sex. Merrill-Palmer Quarterly, 38(2), 212-232.

Black , B., & Hazen , N., L. (1990). Social status and patterns of communication in acquainted and unacquainted preschool children. Developmental Psychology, 26(3), 379-387.

Black, B., & Logan, A. (1995). Links between communication patterns in mother-child, father-child, and child-peer interactions and children's social status. Child Development, 66, 255-271.

Blaye, A., Light, P., Joiner R. & Sheldon, S. (1991) Collaboration as a facilitator of planning and problem-solving on a computer based task. British Journal of Developmental Psychology, 9, 471-483.

Coie , J., D , Dodge , K., A , & Coppotelli , H. (1982). Dimensions and types of social status : A cross-age perspective. Developmental Psychology, 18(4), 557-570.

Daniels-Bierness, T. (1989). Measuring peer status in boys and girls: A problem of apples and oranges? In B. Schneider, G. Attili, J. Nadel, & R. Weissberg (Eds.), Social competence in the developmental perspective, (pp. 107-120). Dordrecht: Kluwer Academic Publishers.

Durkin, K. (1995). Developmental social psychology. Oxford: Blackwell.

Hartup, W, (1996). Cooperation, close relationships, and cognitive development. In W. M. Bukowski, A. F. Newcomb, & W. W. Hartup (Eds.), The company they keep: Friendships and their developmental significance. New York: Cambridge University Press.

Izard, C. (1995). <u>MAX: The maximally discriminative facial movement coding system (revised)</u>. Newark: University of Delaware Instructional Resources Center.

Kemple, K., Speranza, H., & Hazen, N. (1992). Cohesive discourse and peer acceptance: Longitudinal relations in the preschool years. <u>Merrill-Palmer Quarterly</u>, <u>38</u>(3), 364-381.

Denham, S., A, McKinley, M., Couchoud, E., A, & Holt, R. (1990). Emotional and behavioural predictors of preschool peer ratings. <u>Child Development, 61</u>, 1145-1152.

Kruger, A. (1993). Peer collaboration: Conflict, cooperation or both? <u>Social Development, 2</u>(3), 165-182.

Kutnick, P. (1997). Computer-based problem-solving: The effects of group composition and social skills on a cognitive, joint action task. <u>Educational Research</u>, <u>39</u>(2), 135-147.

Kutnick and Manson, 1998

Light, P., & Glachan, M. (1985). Facilitation of individual problem solving through peer interaction. <u>Educational Psychology, 5</u>(3&4), 217-224.

Littleton and Hakkinen (1999)

Ladd, G. (1989). Children's social competence and social supports: Precursors of early school adjustment? In B. Schneider, G. Attili, J. Nadel, & R. Weissberg (Eds.), <u>Social competence in developmental   perspective,</u> (pp. 277-291). Dordrecht: Kluwer Academic Publishers.

Markell, R., & Asher, S. (1984). Children's interactions in Dyads: Interpersonal influence and sociometric status. <u>Child Development, 55</u>, 1412-1424.

Murphy, S. (1999). Young children's behaviour in interactive tasks: The effects of popularity on communication and task performance. Unpublished doctoral dissertation, Open University, UK..

Newcombe, A., & Bukowski, W. (1983). Social impact and social preference as determinants of children's peer group status. <u>Developmental Psychology, 19</u>(6), 856-867.

Nowicki, S., Jr, & Duke, M., P. (1992). The association of children's nonverbal decoding abilities with their popularity, locus of control and academic acheivement. <u>Journal of Genetic Psychology, 153</u>(4), 385-393.

Philippot, P., & Feldman, R., S. (1990). Age and social competence in preschooler's decoding of facial expression. <u>British Journal of Social Psychology</u>, <u>29</u>, 43-54.

Rabiner, D., L, & Gordon, L., V. (1992). The coordination of conflicting social goals: Differences between rejected and non-rejected boys. <u>Child Development, 63</u>, 1344-1350.

Underwood, M. (1993). <u>An observational investigation of children's responses to peer provocation: Gender differences and socially competent responses</u>. Unpublished manuscript, University of Nottingham, UK

Walden, T., A, & Field, T., M. (1990). Preschool children's social competence and production and discrimination of affective expression. <u>British Journal of Developmental Psychology</u>, 8, 65-76.

Wood, D., Wood, H., Ainsworth, S., & O'Malley, C. (1995). On becoming a tutor: Towards an ontogenetic model. <u>Cognition and Instruction</u>, 13(4), 565-581

Table 1a

Mean number of 'offers' made by children according to Pair Type and Gender.

| | | *Pair Type* | | | | | | |
| | | Popular | | Mixed | | Unpopular | |
Gender	n	M	Mdn	M	Mdn	M	Mdn
Boys	12	1.25	1.00	2.08	2.00	0.58	0.00
Girls	12	1.16	1.00	1.42	1.50	2.08	2.00
Overall Mean		1.21		1.75		1.33	

Table 1b

Mean number of 'offers' made in Mixed pairs according to Popularity and

Gender.

| Gender | n | Mixed Pairs | | Unpopular Child | |
| | | Popular Child | | | |
		M	Mdn	M	Mdn
Boys	6	1.66	1.50	2.50	2.50
Girls	6	1.33	1.50	1.50	1.50
Overall Mean		1.45		2.00	

Note. In both Tables 1a and 1b the values represent the mean and median. Children could make a maximum of 5 'offers' to their partner.

Table 2a

<u>Mean number of 'rule violations' per child according to Pair Type and Gender</u>.

		Popular		Mixed		Unpopular	
Gender	**n**	M	Mdn	M	Mdn	M	Mdn
Boys	12	1.58	1.00	2.25	2.00	2.83	2.00
Girls	12	0.75	0.00	3.08	2.50	2.58	3.00
Overall Mean		1.16		2.67		2.71	

Pair Type

Note. There was no upper limit to the number of 'rule violations' each child could make.

Table 2b

Mean number of 'rule violations' in Mixed Pairs according to Popularity and

Gender.

| Gender | n | Mixed Pairs | | | | |
| | | Popular Child | | Unpopular Child | | |
		M	Mdn		M	Mdn
Boys	6	1.50	1.50		3.00	2.5 0
Girls	6	2.50	2.00		3.66	3.00
Overall Mean		2.00			3.33	

Table 3

Observed and expected number of 'rule reminders' according to Pair Type and Gender.

Gender	$\underline{n}$	Popular			Mixed			Unpopular		
		f	f_e	χ^2	f	f_e	χ^2	f	f_e	χ^2
Boys	12	30.0	30.5	0.01	29.0	37.2	1.83	58.0	49.1	1.58
Girls	12	34.0	33.4	0.01	49.0	40.8	1.67	45.0	53.8	1.44

Pair Type (header spanning Popular / Mixed / Unpopular)

Note. $\underline{f}$ = observed frequency, $\underline{f_e}$ = expected frequency, χ^2 = individual cell Chi-square. Summing across cells gives the overall Chi-square value.

Table 4

Observed and expected frequencies for the total number of disagreements according to Pair Type and Gender.

| | | Pair Type | | | | | | | | |
| | | Popular | | | Mixed | | | Unpopular | | |
Gender	$\underline{n}$	f	f_e	χ^2	f	f_e	χ^2	f	f_e	χ^2
Boys	12	42.0	46.0	0.27	62.0	75.0	2.38	91.0	74.0	3.86
Girls	12	25.0	22.0	0.58	49.0	36.0	5.06	18.0	34.0	8.21

Table 5a

Percentage of disagreements which were elaborated according to Pair Type and Gender.

		Popular			Mixed			Unpopular		
					Pair Type					
Gender	**n**	f	f_e	χ^2	f	f_e	χ^2	f	f_e	χ^2
Boys	12	62%	54%	1.16	44%	57%	3.17	37%	39%	0.98
Girls	12	48%	56%	1.13	73%	59%	3.06	27%	32%	0.95

Table 5b

<u>Observed and expected frequencies for the percentage of elaborated</u>

<u>disagreements in Mixed Pairs according to Popularity and Gender</u>.

| Gender | $\underline{n}$ | *Mixed Pairs* | | | | | | |
| | | *Popular Child* | | | Unpopular Child | | |
		f	f_e	χ^2	f	f_e	χ^2
Boys	6	41%	48%	0.89	45%	38%	1.11
Girls	6	85%	78%	0.54	57%	64%	0.67

Table 6

Total number and percentages of facial expressions observed during a two minute sample of interaction according to Pair Type.

	Pair Type					
	Popular		*Mixed*		*Unpopular*	
FE [a]	**f**	**%**	**f**	**%**	**f**	**%**
Brow	64	18	55	14	65	16
Frown	24	7	23	6	36	9
Smile	233	65	224	57	219	55
Mouth	37	10	89	23	76	20
Total	358		391		396	

Note. [a] FE = type of Facial Expression: raised brow (Brow); mild frown (Frown); smile (Smile); down-turned mouth (Mouth). The column percentages are percentages of the total number of facial expressions for each Pair Type.

Table 7a

Total number and percentages of partner's facial expressions seen during a two minute sample of interaction according to Pair Type.

FE [a]	Pair Type					
	Popular		Mixed		Unpopular	
	f	**%**	**f**	**%**	**f**	**%**
Brow	49	76.5	41	74.5	40	61.5
Frown	17	70.8	16	66.7	21	60.0
Smile	164	73.5	153	68.3	105	64.0
Mouth	25	67.5	49	56.0	30	48.0
Total	255	**M**	259	**M** 66.4%	196	**M** 58.4%

72%

Note. [a] FE = type of Facial Expression: raised brow (Brow); mild frown (Frown); smile (Smile); down-turned mouth (Mouth). The values in each pair of columns represent the number of times a child looked at his/her partner's facial expression (f) and this number expressed as a percentage (%) of times the partner was displaying an identifiable expression.

Table 7b

Total number and percentages of partner's facial expressions seen during a two minute sample of interaction for children in Mixed pairs

| | Mixed pair | | | |
| | Popular child | | Unpopular child | |
FE [a]	f	%	f	%
Brow	20	57.0	21	72.0
Frown	12	85.7	4	50.0
Smile	71	71.7	82	65.6
Mouth	31	64.5	18	46.0
Total	134	M 69.7%	125	M 50%

Note. See note for table 6a