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Gender, gender relations, and the social dynamics of children's conversations

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Abstract

We investigated the effects of gender on the social dynamics and outcomes of the conversations of 120 children (mean age = 8 years, 7 months). Children, who were taught particular values for different shaped counters, were placed in same gender or mixed gender (boy-girl) pairs with children who were taught different values. The pairs were asked to add the counters together to make a total of 100. Conversations were coded in terms of communication acts (Leaper, 1991) and simultaneous speech acts (interruptions). Boys used more controlling acts overall and more negative interruptions in mixed gender pairs. Girls used more affiliating acts. All children used more collaborative communication in same gender compared with mixed gender pairings. Children whose perspective dominated in interaction used more controlling and comparatively less affiliating acts whereas when children reached a compromise their conversations were more collaborative. Results are discussed in relation to gendered styles of communication and the status dynamics arising from gender in social interaction.

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Given the ubiquity and importance of gender to a child's everyday life (Lloyd &
Duveen, 1992) it is perhaps unsurprising that a good deal of research has identified its
influence in children's conversations and social interactions. From preschool onwards,
children's peer interactions are delineated along gender lines (Howe & McWilliam,
2001; Killen & Naigles, 1995; Maccoby, 1998; Maccoby & Jacklin, 1987). Studies of
naturally occurring conversations between children (e.g. Leaper, 1991; Leaper,
Tenenbaum & Shaffer, 1999) indicate that boys' conversations are characterised by
greater independence, competitiveness and dominance whereas girls' conversations
are characterised by closeness, cooperation and interpersonal exchange. Gender
effects have also been found in problem-solving discussion between peers in more
formal, educational settings (e.g. Light, Littleton, Bale, Joiner & Messer, 2000). The
effects of gender in conversation persist into adulthood (e.g. Tannen, 1990) and affect
not only who we talk to, but also how we talk to them and what we talk to them about.

In the current study we examine the ways in which gender and gender relations
affect processes of children's peer conversations. We presented boy-boy, girl-girl and
girl-boy pairs with a novel perspective-resolution task: children each received
different information about the values of a set of coloured counters, and were asked to
provide a joint response to a simple mathematical problem using the same set of
counters. However, the goal of the study was not to assess mathematical ability.
Rather, we used the task as a vehicle for identifying how a child's gender and that of a
conversation partner affects the social dynamics of conversation. The current study
builds upon existing research on children's conversations by exploring not just
variations in the process of discussion but also variations in the outcomes of

discussion. In terms of the latter, we focus on whether one child's perspective dominates any agreement reached, or whether children reach some form of compromise between contrasting perspectives. In other words we examine both the social dynamics of interaction and the social dynamics of agreement (the outcomes of conversation).

A number of important themes have emerged from previous research exploring the links between gender, interaction and collaborative learning. First, in mixed-gender interactions boys tend to dominate apparatus, teacher attention and peer discussion within the classroom (for a review see Howe, 1997). Second, the comparative context and in particular task are important in determining how children engage in collaborative interaction (Holmes-Lonergan, 2003). Third, a child's gender and that of his or her conversation partner appear to affect the dynamics of conversation but not necessarily the answer that children agree upon (Leman, 2002): specifically, boys tend to show greater resistance to girls' arguments but ultimately all children tend to opt for the developmentally more advanced answer after interaction, regardless of whether a girl or a boy has put these arguments forward.

A further consideration for studies of gender and interaction is the influence of both speaker's and partner's gender on conversation. Leaper (1991) examined both these types of gender effect on communication between pairs of children in two different age groups (5 and 7 years) who were engaged in play with a puppet. Leaper devised a coding scheme to ascertain the extent to which children were involved in interaction or sought to influence the other child. Key findings from this earlier study (with European American children) were replicated with an African American sample (Leaper *et al.*, 1999). Leaper *et al.* used an updated version of Leaper's Psychosocial Processes Coding Scheme to explore 7 year-old children's use of different

communication acts. Boys used more controlling acts and engaged in more domineering exchanges than girls, but this was true only in all-boy pairings. Girls used more collaborating and informing acts. All children were sensitive to their partner's gender: specifically, children used more informing acts and fewer controlling and domineering acts when with a girl. From Leaper's research we see the importance of recognising conversation as a two-way process in which there is interdependence between each child's contribution. Not only do boys and girls appear to use different communication styles but children also seem to adapt these styles to fit the context in which communication happens (or rather the context of who communication happens with).

Maltz and Borker (1982) sought to account for gender differences in verbal behaviour by arguing that boys and girls grow up in different subcultures and develop different interactional goals and associated verbal strategies (see also Franzwa & Lockhart, 1998; Maccoby, 1998; Tannen, 1990). This argument, often referred to as the "two cultures" approach, suggests that the conversational goals of men and women remain the same regardless of the context. In contrast, status characteristics theory (James & Drakich, 1993) proposes that in social interaction individuals evaluate themselves relative to other individuals with whom they are participating. Researchers such as Lakoff (1990) have argued that differences in verbal behaviour mirror differences in power relationships that exist between males and females on a broader, societal level. Thus power is the characteristic responsible for many gender differences in interaction.

Research with adults on alternative accounts of the origins of gender differences in conversation has explored the use of simultaneous speech acts as a measure of conversational style and dominance. Simultaneous speech acts have been variously

defined (see Anderson & Leaper, 1998a; Bresnahan & Cai, 1996) but can broadly be characterised as conversational situations where two people speak at the same time: thus including many conversational elements that might be defined as interruptions. Early research identified interruptions as negative aspects of conversation. As a consequence it was argued that interruptions were predominantly used by men in male-female conversations to exercise power and dominance by taking the conversational floor (Zimmerman & West, 1975). However, there are forms of simultaneous speech that can be seen as constituting more positive conversational gambits. For instance, "back-channels" are minimal responses that signal a speaker's support such as "Yeah", "OK" but do not constitute a bid to take control of the conversation. Moreover, when the purpose of an interruption as agreement or disagreement is taken into account there are interesting variations in use by men and women. Willis and Williams (1976) found that female interrupters used more agreeing interruptions with males than with other females. Dindia (1987) found a similar effect but also that males used more agreeing interruptions with females than with other men. Mast (2002) however finds no differences in simultaneous speech acts between all-male and all-female pairs. Taken together, these studies (despite some differences in main findings) support a status characteristics account because males' and females' use of simultaneous speech acts appears to vary with the gender of a child's conversation partner. These studies also point to the importance of considering not just the amount but also the function or type of interruption (positive or supportive and negative or attacking) in conversation.

From a developmental perspective, the study of children's interactions and the social dynamics associated with gender is a topic of great importance. Children's social interaction provides a context for learning about others and, in turn, about

oneself. Some researchers have argued that interactions with peers may be of particular importance here because it is within peer relationships that children come to understand, for themselves, cultural and social norms (Harris, 1995) and a acquire a sense of autonomy, respect for others and interpersonal obligation (Piaget, 1932). Peer conversation also promotes cognitive development (Doise & Mugny, 1984). Ames and Murray (1982) found that non-conservers showed significant advances in reasoning when they interacted with another non-conserving peer on several conservation tasks compared to a child who tried to solve the problems alone. Yet despite clear evidence of a link between interaction and development, there has been relatively little success in identifying features of interaction that link the communication and acquisition of knowledge to subsequent cognitive change (see Leman, 2002). Moreover, little work has systematically focussed on how features of children's conversations may affect one another in same and mixed gender pairs on a problem-solving task.

In the current study we took two sets of measures of conversational style. First, the use of different communication acts was gauged using a version of the Psychosocial Processes Coding Scheme (PPCS, Leaper, 1991; Leaper *et al.*, 1999) that was adapted for use with the perspective-resolution task. Second, the use of three different categories of simultaneous speech act – facilitative overlaps, and positive and negative interruptions - was examined. The solutions that each pair gave to the task made it possible to identify three different forms of agreement: *win-lose* solutions one in which one child's perspective (or beliefs about the values of each counter) was chosen to make the calculation, *compromise* in which a solution was identified that satisfied the perspective of both children in a pair, and *social compromise* in which an incorrect

solution was given, but the solution nevertheless recognised some aspect of each child's perspective as relevant to the task.

On the basis of previous research, we were able to set several research questions, and make several predictions. First, it is important to explore whether the gender-mix of a pair (boy-boy, girl-girl or girl-boy) influences the way in which differences in perspective are resolved. No specific predictions were made because to our knowledge no previous work has examined how such differences are resolved between children (i.e., win-lose, compromise and so on).

Second, the current study also made it possible to contrast the alternative explanations for gender differences in communication – the two cultures and status characteristics accounts. According to Carli (1989, 1990) support for the two cultures approach would be seen if gender differences were greater during same-gender than during mixed-gender interactions because same-gender partners share similar social norms pertaining to interaction and communication. In contrast, status characteristics theory would predict fewer differences between all-boy and all-girl pairs in same-gender conversation because it is within mixed-gender interactions that gender becomes a status characteristic.

In light of the distinction between two cultures and status characteristics accounts, and following from Leaper's (Leaper, 1991; Leaper et al., 1999) previous work on children's use of communication acts, we were able to generate contrasting predictions from the two accounts. The two cultures approach predicts marked stylistic differences between all-girl and all-boy pairs. Correspondingly, differences in the use of communication acts should be more marked between same-gender than between mixed-gender pairs because it is the gendered styles of children rather than the comparative context that affects use of communication acts. In contrast, the status

characteristics approach predicts fewer differences between all-boy and all-girl conversations because status is relatively equal between conversation participants. Moreover, in boy-girl pairs we should anticipate differences in the forms of communication act employed by boys and girls. We also predicted (consistent with both approaches) that in boy-girl pairs, boys will tend to dominate. Specifically, boys would be more controlling in these mixed-gender pairs, whereas girls would be more obliging.

Again, relating to the distinction between two cultures and status characteristics approaches, we were able to make predictions concerning children's use of simultaneous speech acts. The study of simultaneous speech acts between children has been studied surprisingly little (for an exception see Esposito, 1979[1]). Status characteristics theory predicts that there would be no difference between boy-boy and girl-girl pairings because, in status terms, children in a pair are comparatively equal. In contrast, two cultures approaches predict that the different styles of boys and girls would lead to girls' pairings using more facilitative overlaps and positive forms of interruption, and boys' pairings using more negative interruption. However, in girl-boy pairings, where gender leads to status inequalities, both approaches would anticipate that boys will use more negative interruptions than the girls, and that the girls will use more positive interruptions and facilitative overlaps than the boys.

Finally, we explored the relations between the outcomes of conversations and the differential use of various conversation measures. We made no specific predictions about the possible relations between conversational measures and outcomes.

Method

Participants

One hundred and twenty children (60 boys and 60 girls) participated in the study. All children were in their fourth year of formal education (mean age 8 years, 7 months). Children came from three similar schools in London, UK from broadly working-middle class areas. The ethnic mix of participants reflected the ethnic mix of the schools from which they came. Sixty-nine were white (29 boys, 40 girls), 25 were South Asian (Indian, Pakistani and Bangladeshi – 15 boys, 10 girls), 20 black (black African and black Caribbean – 15 boys, 5 girls), and 6 were mixed-raced (1 boy, 5 girls).

Materials and stimuli

The stimuli for the task consisted of 60 laminated cardboard counters, each approximately 5cm x 5cm in size. Twenty counters were shaped either as red squares, twenty as blue triangles or and twenty as yellow circles.

For the paired task a transparent plastic container 20cm x 13cm in size was placed in front of the children. The container had a printed label reading, "Final answer to make 100," to remind children of the task. Individual children's responses and children's conversations were videotaped for later analysis.

Procedure

The experiment involved two phases: an individual task and a paired interaction task. Before the experiment, teachers rated children's mathematical ability and socio-metric status on simple 5-point scales (1=low to 5=high)[2]. Each child was assigned to a pair as follows: participants were first randomly assigned to either same gender or mixed gender pairings, then to a partner with similar (within 2 points on the 5-point scale) teacher ratings of mathematical ability and sociometric status. There were 20 pairs of each different type (boy-boy, girl-girl, girl-boy) making a total of 60 pairs. Children were paired with another child from the same school, so almost certainly

knew one another, but pairs did not consist of "close friends" (close friends were defined by the class teacher).

Individual task

In the first phase each child in a pair was taken to a separate room by one of the two female experimenters. Thus experimenter A took child A to one room and experimenter B took the child B to a separate room. Each child was asked to sit at a table and was shown 3 piles of counters – 10 squares, 10 circles and 10 triangles. The piles of shapes were laid out in a triangular formation and the arrangement was counterbalanced. In half the trials the triangles were at the top, the squares were lower and to the left and the circles lower and to the right. In the other half of trials the squares were at the top, the triangles were lower and to the left and the circles lower and to the right.

Experimenter A read the following instructions to child A: "There are 3 shapes in front of you: a triangle, a square, and a circle. Each shape has a different value. The *square* is worth 50, the *triangle* is worth 20 and the *circle* is worth 10. I need you to remember these values for me." (The experimenter then repeated the values). "So now, can you tell me, what is the triangle worth? What is the square worth? What is the circle worth?" If children did not answer with the correct value (which was rare) the experimenter informed them of it and was told again the values associated with each counter. The experiment proceeded once the child had correctly identified the value associated with each shape.

Experimenter A then continued: "Just to see if you have remembered the numbers, can you think of a way to make 70 out of these shapes? Put them out in front of you. You can use as many shapes as you want." Once the child successfully made the value of 70 the experiment proceeded and the experimenter asked, "Can you think of

another way to make 70 that is different from the way you just made it?" Again, once the child successfully made the value of 70 with the counters the experimenter said: "I am now going to make the task very slightly harder. Can you make 80 for me using the shapes?" And again, "Can you think of another way to make 80 that is different from the way you just made it?"

As would be expected at this age, all children easily performed these independent calculations and understood the values of the counters. The child was then told about the paired session, and Experimenter A continued: "Now you are going to be paired with [child B], where you will be doing a similar task together. It is very important that you remember the values of the shapes, as you will need to know them when you work with [child B]. You might find that you disagree with the other person, but it is important that you explain to the other person why you think what you do. If they think something different to what you think, try and talk about it, and explain to them what you think."

Experimenter B carried out exactly the same procedure with child B but with one crucial difference: child B is told that the *triangle* is worth 50, the *square* is worth 20 and the circle is worth 10. Thus for each child different counters (square and triangle) have different values. In some cases (e.g. making 70 using a square and a triangle) there is no difference in the counters that child A and B might select. However, in other tasks (making 90 or 100) there is the potential for conflict between children's choices of the appropriate counters – certainly in terms of the most parsimonious configuration of counters required to make the amount.

Paired task

Child A and Child B were then brought together and sat, next to one another at a table. On the table in front of them were the same three piles of shapes in the same

configuration as before. One of the experimenters (alternately A or B) read out the following instructions: "In front of you there are three piles of shapes, just like there were before. We would like you to now do a very similar thing to what you did just now, but this time we want you to work together to make the value 100. When you have thought of one way to make one hundred, could you put your shapes in this tray, please. Could you now work together and come up with one way to make the value 100?"

The experimenters moved away to allow children to discuss the issue and interacted with children only to remind them to complete the task together. Occasionally children would appeal to the experimenter or ask for clarification about the conflicting information they had been given. If this happened, the experimenter(s) repeated the instruction to the children that they must work together to agree a solution. After children had agreed on a response their answer was noted. All children were given a full debriefing where the aims of the task were explained to them, and in particular the fact that each had been told counters were different values.

Note on solutions to paired task

Children agreed on a number of different configurations of counters that they combined to make a value of 100. Some possible solutions would appear correct for one child but not for the other. For instance, child A (who has been told that the square is with 50 and the triangle 20) could make 100 by combining two square counters. For child B two square counters combine to make a value of only 40. In these instances, when the pair decide upon a solution we can conclude that one child's perspective has dominated or "won" (*winner)* whilst the other has "lost" (*loser*).

Some combinations of counters, however, can produce a result equal to 100 that both children should be happy with. For instance, both children associate a value of 10

with the circle. So 10 circles will, for both children, equal 100. Similarly, the combination of a square, a triangle and three circles should equal 100 to the satisfaction of both children. Such agreements could be described as *compromise* solutions.

In the event, 4 pairs of children gave paired solutions that did not equal 100: three pairs in the girl-girl pairing gave the solution of a square and a triangle that (in terms of the initial perspectives of both children this solution) equals 70. The remaining pair was in the boy-girl pairing and gave the solution of two squares, two triangles and two circles (for both children this would equal 160). Whilst these solutions are incorrect they both represent a compromise of sorts because they do not favour one child's perspective over the other's. Thus a square and triangle combined (and the other configuration) constitute a form of *social compromise* because both children arrive at a solution that may resolve disagreement (without correctly resolving the task itself).

<u>Measures of conversation and conversational style</u>

Children's conversations were transcribed from both the video and audio recordings. In an initial phase of conversational coding we identified conversational turns for each child. Following Levinson (1983), we took our definition of a turn as a time during which a single participant speaks, within a typical, orderly arrangement in which participants speak with minimal overlap and gap between them. Conversation turns formed the unit of analysis for both communication acts and speech acts.

The video recordings were then observed again and the transcripts read again. Each turn was coded, when appropriate, by one of the experimenters into one of four categories of communication act: collaborative, obliging, controlling, and withdrawing.   Classification of communication acts depended on verbal content, voice tone, facial expressions, and overall intent of the speaker. The frequency of each

type of speech act was also collated for each child. By their very nature speech acts relate to aspects of communication that occur on the boundaries of conversational turns whereas communication acts may occur within a turn. A maximum of one communication act and one speech act was recorded per turn for each child (in the case of speech acts this was always at the beginning of a turn).

<u>Communication acts</u>

The scale used to categorise children's communication styles was based on the Psychosocial Processes Coding Scheme (henceforth PPCS) devised by Leaper (see Leaper, 1987, 1991; Leaper, Leve, Strasser & Schwartz, 1995; Leaper, Tenenbaum & Shaffer, 1999). The PPCS aims to analyse expressions of assertion and affiliation during social interactions. The PPCS can be used in sequential analyses in order to detect communication patterns in children's conversations. For the purposes of the current study, we adapted the scale to make possible fuller analysis of particular behaviours that were specific to the task used in the current study. In the current study we classified communication acts into 4 broad categories: collaborative, obliging, controlling, and withdrawing.

Collaborative acts are highly assertive and highly affiliative and include such conversational features as initiating a new course of action, helping the other build an answer using the shapes together, counting shapes with the other person, suggesting a course of action without a dogmatic or hostile manner. *Obliging* acts are high in affiliation but low in assertion. Examples of obliging acts include seeking help from a partner by requesting information, action or confirmation (e.g. "How many of these?"), seeking approval from a partner, going along with an answer by accepting without question a partner's proposal and deferring to the other to avoid conflict. *Controlling* acts are high in assertion and low in affiliation. These include directing a

partner in a dogmatic manner, building on their own answer without engaging with a partner, shaking head, attempting to place the shapes in the tray without confirmation from a partner, disagreeing with a partner in a hostile or aggressive way, snatching shapes from a partner and forceful physical acts (e.g. moving a partner's hand away). Finally, *withdrawing* acts include showing disinterest in the task, looking around the room, being unresponsive and not participating in the task.

There are two key differences between the previous framework and the adapted version we used here. First, the original *inform* category was not included in the current analysis because, due to the nature of the task, children frequently informed their partner of the perceived values of the shapes. Instead, the way in which children informed their partner was taken into account, for example, whether they informed the other in a hostile, frustrated tone (controlling), or in a manner that was intended to assist the other (collaborative).

Second, the original framework counted silences greater than 4 seconds within the withdraw category. But one feature of the task here was that children often watched their partner continue or just allowed their partner to take control rather than withdrawing from the task altogether. So for the present study we categorised this behaviour as obliging and changed the criterion to silences lasting longer than 5 seconds.

<u>Simultaneous speech acts</u>

Conversational overlaps have been defined as when an individual begins to speak before another individual has completed a sentence or phrase (Zimmerman & West, 1975). Jefferson (1973) noted that an overlap could be characterised as non-interruptive simultaneous speech and can include such items as empathetic agreement or longer incursions into speech such as simultaneously saying the same thing. In this

sense overlaps have some facilitative warrant and can also signal intensive involvement and active listening in conversation.

In the current study several criteria were used to identify facilitative overlaps. All overlaps were simultaneous utterances that could include back-channels (minimal responses that signal the listener's support such as "yeah", "OK", "I see"), simultaneous counting and other types of speech that did not constitute any form of bid to take control of the conversation.

Anderson and Leaper (1998a) in a meta-analysis of gender and interruption, found wide variation in the definition of conversational interruption. Moreover, any results found between genders in terms of the amount of interruption in conversation appeared to differ according to the definition that researchers employed. For instance, studies defining interruptions in a more negative manner – as intrusive interruptions that included attempts to seize the other speaker's conversational turn or attack a speaker's point – tended to find that males interrupted more than women in same gender interactions (in male-female interaction the effect was negligible). In contrast, studies using broader definitions found no such effects.

In the current study we defined positive interruptions as simultaneous utterances that constituted bids to take the floor but not necessarily in a hostile or negative manner. These included statements of uncertainty (almost disclaimers) such as, "I thought that was 50," interrupting to ask the experimenters the correct values or interrupting to reassert a position but not denigrate the speaker's position.

We defined interruptions of a negative nature as simultaneous utterances that constituted bids to take the floor in a hostile or negative manner. Examples of negative interruptions include successful interruptions that stop the other person from talking or attacking their position or previous statement, excessive use of repetition or

reassertion of a particular perspective and interruption in a dominant or aggressive tone.

<u>Reliability of conversation measures</u>

To test the reliability of the coding of communication acts and speech acts a second experimenter coded blind the contribution of each child in 15 of the conversations (25%) – 5 from boy-boy, girl-girl and boy-girl pairings respectively. There was excellent agreement between judges for the total number of conversational turns taken by each child, $\kappa = .86$. There was also excellent agreement between the judges on ratings for both communication acts and speech acts. For communication acts: overall, $\kappa = .92$; collaborative, $\kappa = .92$; obliging, $\kappa = .82$; controlling, $\kappa = .91$; withdrawing, $\kappa = 1.00$. For simultaneous speech acts: overall, $\kappa = .85$; overlaps, $\kappa = .89$; positive interruptions, $\kappa = .84$; negative interruptions, $\kappa = .81$.

<div align="center">Results</div>

<u>Design</u>

The experiment employed a between subjects design. Child's gender (male or female) was a blocking variable. The independent variable was the gender-pairing that the child was in: boy-boy, girl-girl, or boy-girl. There were a number of dependent variables. Two of these related to the outcomes of interaction: the response of the dyad (win-lose, compromise or social compromise); the response in terms of the individual child's original perspective (winner, loser, compromiser). Further dependent variables were measures of features of conversation and communication acts. There were four types of communication act: collaborative, controlling, obliging and withdrawing; a binary distinction between acts of high (collaborative and obliging) versus low (controlling and withdrawing) affiliation; a binary distinction between acts of high (collaborative and controlling) versus low (obliging and

withdrawing) assertion. Finally, the dependent measures were features of simultaneous speech were conversational overlaps, interruptions of a positive nature and interruptions of a negative nature.

Analyses of communication acts and speech acts involve proportional scores. For communication acts, proportional scores for each act were calculated by dividing the frequency of the particular communication act used by each child by the total number of speech acts used by the child. A similar calculation was used when calculating the proportionate use of speech acts (except the frequency of use of a speech act was divided by the total number of speech acts). For all analyses involving the use of communication and speech acts we checked for non-normality that can sometimes be associated with proportional data. With very few exceptions (all of which related to the minimal use of the withdraw category in PPCS) the proportional data were distributed normally. Moreover, normalization of scores using arc sine transformations did not affect any significance levels. In the subsequent presentation of results we therefore report the untransformed scores.

Analysing dyadic interaction: the issue of non-independence

The results reported here relate to data that focuses variously on three separate "units" of analysis: (a) the pair, (b) the individual child, and (c) the child's conversation partner. The analysis of dyadic interaction presents a particular statistical challenge to researchers. Specifically, the conversation and interaction of one dyad member is (almost inevitably) dependent upon the conversation and interaction of their partner. This issue of non-independence (Gonzalez & Griffin, 2000) is often ignored in studies of conversation and interaction. However, failure to account for non-independence in dyadic interaction can run an increased risk of type I errors. In the current study the gender mix of pairs varies and so there is the possibility that

certain analyses may confound gender results and vice versa. If, for instance, girls generally use more positive forms of communication then it should come as no surprise that the all-girl pair also has high instances of positive communication. In a similar vein, a girl might well behave very differently with a boy than with another girl: for instance, using more or less positive forms of communication in the two different pairings.

Leaper *et al.* (1999) addressed the issue of non-independence in their parametric data using procedures suggested by Kraemer and Jacklin (1979) and Carli (1989a; 1989b). In the current study we use this technique again for parametric data relating to simultaneous speech acts. The process involves applying a set of formulae to the means and mean error terms from two separate ANOVAs, one for the same-gender pairs and the other for the mixed-gender pairs. For the same-gender pairs, gender is a between-group factor. For the mixed-gender pairs, gender is a within-group factor. Mean and mean error scores are used as follows. The formulae for each comparison share a common denominator: $[(2Ms_e + 2MS'_e)(1/n)]^{1/2}$, where Ms_e is the mean error score for gender effects in same-gender pairs, and MS'_e is the mean error score for gender effects in mixed-gender pairs, and n is the number of observations used in the analysis. The numerator for speaker gender effects is $(M_{gs} + M_{gm} - M_{bs} - M_{bm})$, and for partner gender effects is $[(M_{gs} - M_{gm}) + (M_{bm} - M_{bs})]$, where M_{gs} is the mean for girls and M_{bs} is the mean for boys in same-gender pairs, and M_{gm} is the mean for girls and M_{bm} is the mean for boys in mixed-gender pairs. Finally, what Carli labelled an interaction effect has numerator $[(M_{gs} - M_{gm}) - (M_{bm} + M_{bs})]$ and contrasts the extent of any gender differences in same and mixed-gender pairs. The formulae transform the ANOVA output scores to provide separate values of *t* statistic for tests relating to gender in each of the separate parameters (speaker and partner gender effects and

interaction effects). For speaker and partner gender effects, a positive value of t indicates a larger score for girls than for boys. A positive value of t for interaction effects indicates that the differences between boys' and girls' use of communication acts is greater in same-gender than in mixed-gender pairs. After using the correction for non-independence, simple effects tests can be used to examine speaker gender and partner gender effects in interaction. These simple effects tests compare in turn the contribution of boys and girls in the mixed gender pair, the contribution of girls only in the same and mixed-gender pairs, and the contribution of boys only in the same and mixed-gender pairs.

Conversation outcomes

Analysis of the outcomes of conversations (the agreed response of the pair) showed no significant association with the gender-mix of a pair (boy-boy, girl-girl, girl-boy). In the boy-boy pairing 11 pairs resulted in one child's perspective dominating (win-lose), 9 pairs reached a compromise. In girl-girl pairs 14 pairs resulted in win-lose, 3 in compromise and 3 in social compromise. In the girl-boy pair 11 pairs resulted in win-lose, 8 in compromise and 1 in social compromise. However, the numbers of pairs reaching a social compromise is low and may distort the analysis because a large number of cells have a low expected frequency. Yet removing these from the analysis or compounding them with other compromise scores still produced a non-significant result.

A further analysis was performed to see whether, in the mixed gender pairing, the boys or the girls tended to win out. There was no difference in terms of outcomes here – of the 11 relevant pair discussions, 6 were "won" by a boy, and 5 were "won" by a girl.

Conversational style

Communication acts

The proportionate use of the 4 categories of communication act (collaborative, obliging, controlling and withdrawing) and the two binary distinctions (high-low affiliation and high-low assertion) were analysed in terms of the correction for non-independence outlined above. Analyses sought to examine speaker gender, partner gender and interaction effects. Table 1 reports the proportions of each type of act used for boys and girls in same and mixed gender pairs. The results from the between-groups and within-group ANOVAs also appear in table 1.

--Insert Tables 1 and 2 here--

Table 2 reports the statistics relating to significance tests of effects of speaker and partner gender on proportionate use of communication and speech acts. There was a significant effect of speaker gender on use of collaborative communication acts: girls used more collaborative forms of interaction than boys. There was also an interaction effect on the use of collaborative acts indicating that the gender difference in the use of collaborative acts was greater in mixed-gender than in same-gender pairings. There was also a significant effect of speaker gender on use of obliging acts (again, girls used fewer than boys). The effect of speaker gender on use of controlling acts indicates that boys used more controlling acts than girls. An interaction effect in use of controlling acts suggests that the gender difference was greater in mixed-gender pairings than in same-gender pairings. Follow-up simple effects tests for all four categories showed no significant differences.

Analysis of the binary distinction between high and low affiliation revealed a significant effect of speaker gender – girls used more high affiliation speech acts than boys. A simple effects t-test compared the contribution of boys and girls in the mixed gender pairing. This identified a difference between the use of affiliation acts in the

mixed gender (girl-boy) pairing, $t(38)=-2.69$, $p<.05$. In this pair, girls used far more high affiliation acts than boys, possibly reflecting the speaker gender effects observed across pair types. The difference between groups was associated with a large effect size ($\eta^2=.16$). Finally, an interaction effect indicated that the gender difference in the use of assertive acts was more marked in mixed-gender pairings.

The analysis of the proportionate use of communication acts suggests that speaker gender is important but partner gender is not. Boys, generally, use more controlling acts. Girls use more collaborative and obliging (affiliating) acts regardless of pair type. However, the gender mix of a pair is also important and influences the use of collaborative and controlling acts. Both boys and girls use more collaborative acts in same gender as opposed to mixed gender pairs. The use of acts of high assertion follows a similar pattern – there being far more high assertion used in same gender pairs by both boys and girls.

<u>Simultaneous speech acts</u>

The three different forms of simultaneous speech act – overlaps, positive and negative interruptions – were analysed using the correction for non-independence described above. Mean values for the proportion of simultaneous speech acts used by children, by gender and pair type, are given in Table 1. The results from the between-group (boys in all-boy and girls in all-girl pairs) ANOVA and the within-group (boys and girls in the boy-girl pairs) ANOVA appear in Table 1 also.

Table 2 gives t-scores and significance tests using the correction for non-independence for children's proportionate use of simultaneous speech acts. Boys used more conversation overlaps than girls, and all children used more overlaps when talking with a boy. An interaction effect indicated that both boys and girls differ in their use of overlaps in same-gender and mixed-gender pairs. Specifically, the gender

difference is greater in the mixed gender pair. The nature of this difference is striking.

Boys use proportionately fewer affiliative overlaps when talking with a girl, whereas

girls use more overlaps when talking with a boy (see again Table 1). Follow-up simple

effects tests produce no significant results regarding the use of conversational

overlaps.

There were no significant differences associated with the use of positive

interruptions. However, analysis of data for negative (hostile) interruptions revealed

significant speaker gender, partner gender and interaction effects. The significant

effect of speaker gender indicated that boys used more negative interruptions than

girls. The effect of partner gender indicated that children used more negative

interruptions with a girl than with a boy. Finally, the interaction effect indicated that

the gender difference in the use of negative interruption is greater in mixed-gender

pairs than in same-gender pairs. A subsequent simple effects test (comparing boys in

same- and mixed-gender pairings) indicated that this interaction effect was significant

only for the boys in same and mixed gender pairings ($t(58)=-2.06$, $p<.05$). Boys used

more negative interruption in boy-girl pairs than in boy-boy pairs, whereas girls' use

did not differ significantly by pair type.

Outcomes and conversational style

Analysis of variance was conducted to explore the relations between proportionate

use of different communication acts and the outcomes of interaction. Post hoc Tukey

HSD tests (p<.05) were also conducted to identify any differences between the

different forms of outcome for each child. We were interested to see whether there

were any conversational correlates of winning, losing or reaching a compromise. Thus

a child won a conversation if their pre-interaction perspective (values associated with

different shapes) triumphed in the joint decision. Correspondingly, a child lost if they

forfeited their pre-interaction perspective in the joint decision. Whilst there are clearly some important conceptual differences between reaching a compromise and a social compromise solution, preliminary analysis revealed no significant patterns of difference between the two groups. Moreover, given the very small numbers of social compromisers, for the purposes of this analysis we decided to combine scores from compromisers and social compromisers. The analysis revealed no effects or interactions relating to participant gender or pair type. The absence of significant effects here may be attributable, in part, to small numbers in certain cells. Table 3 reports mean proportions of different communication act by conversation outcome.

--Insert Table 3 here--

There was a significant effect relating outcome to the use of collaborative acts, $F(2, 119)=3.67$, $p<.05$, $\eta^2=.06$. Post hoc Tukey HSD tests indicated that winners ($p=.050$) and compromisers ($p=.041$) used significantly more collaborative acts than losers. The analysis of outcome and use of obliging acts also produced a significant result, $F(2, 119)=28.58$, $p<.001$, $\eta^2=.33$. Post hoc Tukey HSD tests indicated that all three conversation outcomes differed from one another – that is, losers used significantly more obliging acts than compromisers ($p<.001$) and winners ($p<.001$), and compromisers used significantly more obliging acts than winners ($p=.003$). There was also a significant result from the analysis of proportionate use of controlling acts, $F(2, 119)=9.31$, $p<.001$, $\eta^2=.14$; Tukey HSD tests revealed that winners used significantly more controlling acts than both losers ($p<.001$) and compromisers ($p=.005$). Analysis of the binary distinction between high and low affiliation also produced a significant result, $F(2, 119)=6.54$, $p<.01$, $\eta^2=.10$ – post hoc Tukey HSD tests indicating that winners use less affiliation than losers ($p=.002$) and compromisers ($p<.038$). Finally, analysis of the binary distinction between high and low levels of assertion gave a

significant result, $F(2, 119)=27.62$, $p<.001$, $\eta^2=.32$. Post hoc Tukey HSD tests indicated that winners used significantly more assertion than compromisers ($p=.001$) who, in turn, used significantly more assertion than losers ($p<.001$).

A similar analysis of variance was conducted on the proportion scores for simultaneous speech acts (overlaps and interruptions). There were no significant effects relating speech acts to outcomes. (Note that because these are outcome measures, relating to judgements made at the *end* of interaction, the issue of non-independence does not arise).

<div align="center">Discussion</div>

In the current study we examined the ways in which gender influences children's conversations and the outcomes of those conversations. We used a novel perspective-resolution task that made it possible to identify agreement between children that was either on the basis of one child's perspective dominating (win-lose) or on the basis of a correct solution that both children found acceptable (compromise). We posed two exploratory research questions and, on the basis of previous research and theory, made several specific predictions.

A first research question was whether or not the gender-mix of a pair influences the outcomes of conversations between children. Results relating to this first question are not clear-cut. There were no significant differences in the means through which perspective differences are resolved relating to a pair's gender-mix. However, it is striking that well over half of conversations resulted in one child's perspective winning out. When one child wins the other must concede. An alternative to win-lose outcomes are compromise solutions. Compromise requires both the recognition that such a solution is possible and a willingness to achieve it. It requires, if you like, both

children to give up a little of their own perspective to find a solution that is acceptable (and correct) for both of them.

Broadly, there are at least three possible explanations for the inability of the majority of children here to reach such a compromise. A first possibility is that, at this age, children find it difficult to think flexibly about possible alternative solutions to the problem. Children may find it difficult to move beyond the values that they associate with the different shapes and to recognise a solution that preserves part of their own whilst integrating part of the other's perspective. However, this explanation is unlikely. In the initial, individual pre-interaction phase of the study all children were able to make 70 in at least two different ways (using different combinations of counters). This indicates that any explanation in terms of straightforward inflexibility in using different configurations of counters to reach a solution is inadequate.

A second possibility is that some children in the current study may simply not have recognised the possibility of compromise – focussing on social conflict that stemmed from the perspective conflict to the exclusion of pursuing a mutually conducive, mutually "correct" answer. For these children we may describe their appreciation of conversation and discussion as route to knowledge as not fully developed (or their speech as not fully socialised, see Piaget, 1923, 1932).

Related to the second possibility is a third. Research on epistemological understanding (e.g. Kuhn & Weinstock, 2002) suggests that when faced with conflicting knowledge claims 8 year old children may likely insist that one answer must be right and another wrong – in other words at this age children are less aware (or unaware) of the ways in which conflicting claims can be reconciled.

The second and third explanations resonate with studies that have found developmental trends in children's understanding of conversation as a means of

communicating and legitimising knowledge. For instance, Leman and Duveen (1996) observed that whilst younger children (6 years) regard conversation uniquely as a matter of winning or losing, older children (11 years) regard it as a forum for establishing the correct or best solution. An important goal for future research is to identify age-related patterns in how children resolve differences in perspective.

We also made several predictions concerning children's use of communication acts. Consistent with our predictions we found that girl-girl pairs were more affiliative than boy-boy pairings, whereas boy-boy pairs were more controlling than girl-girl pairs. A further finding that was consistent with previous research was that in boy-girl pairs boys tended to dominate the girls: boys used more controlling communication acts whereas girls used more obliging acts. Within the boy-girl pair, girls used more collaborating acts.

An example of one exchange between Sam[3] (boy) and Rachel (girl) appears below.

1. Sam: You just do 50 [takes square]… add…

2. Rachel: I thought that was 50 [points to triangle].

3. Sam: That was 50 [points to square]. That was 50… 50 and that one's 20.

4. Rachel: Are you sure that's 50 [speaks quietly, points to square]?

5. Sam: Two 50s [holds squares]. Or do you want to do 50, 60, 70… [adds five circles to a square]?

6. Rachel: That's… hmm…

7. Sam: [Adds up shapes, square and four circles] That's 50, 60, 70, 80, 90…

8. Rachel: [Takes another circle from the pile and places it with the rest of the shapes.] Hmm…

9. Sam: [Puts all the shapes into the container.]

Sam initiates the conversation using a controlling act (line 1), although Rachel is quick to contest his claim (a collaborative act, line 2) that the square has a value of 50. Sam continues to use controlling acts, either failing to acknowledge Rachel's assertion of the values of the shapes (lines 3 and 5) or simply proceeding with the task regardless of her contribution (lines 7 and 9). Rachel on the other hand questions Sam's assertion (line 4, an obliging act), then hesitates to challenge him (line 6, no act coded). Finally, Rachel signals tacit agreement or concession by assisting Sam with the calculation, on his terms using the square as 50 (line 8).

Our results suggest that the thrust of earlier findings (Leaper, 1991; Leaper *et al.*, 1999) concerning the effects of gender in less structured interaction (free play with puppets) extends to children's conversations in a problem-solving context. Children's use of communication acts (that relate to broader psychosocial processes) correspond to predictions associated with the two cultures approach: boys and girls, by the age of 8 years, have learned something of the conversational styles that correspond to particular gender roles. These styles are in evidence not only in mixed-gender interactions, but also in differences between boys and girls engaged in same-gender interactions. That such gendered knowledge is possessed and utilised in conversation by children of 8 years should not be too surprising. Not only have previous studies of conversation uncovered similar patterns amongst adults (Anderson & Leaper, 1998b; Leaper, 1998), but from what we know of other areas such as toy choice, gender has a profound effect from a young age (e.g. Lam & Leman, 2003; Martin, Eisenbud & Rose, 1995).

However, set alongside the analysis of communication acts, findings relating to children's use of simultaneous speech acts paint a more complex picture of the role of gender in children's conversations. There were variations by gender in the use of both

facilitative overlaps and negative interruptions. More facilitative overlaps were used by boys and by all children when their partner was a boy. The gender-mix of a pair is also important: girls use proportionately fewer affiliative overlaps with another girl than with a boy. Boys, on the other hand, use fewer overlaps when talking with a girl than with another boy. These differences in the use of overlaps provide partial support for both two cultures and status characteristics approaches. Although there are differences between same-gender pairs in their use of overlaps, children also *adapt* their behaviour to accommodate the gender of their conversation partner. This pattern of use of overlaps is consistent with previous research exploring interruption between adults (Mast, 2002; Redeker & Maes, 1996; Smith-Lovin & Brody, 1989).

A different pattern emerges from the results relating to children's use of negative interruptions. There was no difference between the use of negative interruptions in same gender pairs, but boys use a higher proportion of negative interruptions in the mixed-gender pairing (i.e., when speaking with a girl). This pattern of use of negative interruptions suggests greater conflict in these boy-girl pairs. More specifically, it suggests conflict centering around the alternative perspectives that each child has (a negative interruption is an interruption with the purpose of rejecting a partner's position and seizing the floor). Coates (1989), in a similar vein, suggests that there may be higher levels of use of simultaneous speech in situations where there is a high degree of competition or conflict. The current finding is important because it points to the ways in which gender leads to conflict in children's mixed-gender interactions in a way that does not happen in same-gender interactions.

Taken together, findings from the analysis of children's use of simultaneous speech acts indicate that interaction in the mixed-gender pairing is not a simple case of girls being more positive or affiliating and boys more negative or disaffiliating. Changes in

the use of negative interruptions indicate that, in this pair more so than in other pairs, both the boy and the girl voice disagreement with their partner. So it is not the case that girls disagree (or submit) less than the boys. Rather, when paired with boys, girls combine their disagreement with more overlaps – facilitative or affiliating gestures. In one sense, the girls employ a persuasive strategy that involves more coaxing the boys into agreement and the boys use a less subtle strategy that combines negative interruption with disaffiliation.

Results from the analysis of communication acts and simultaneous speech acts present, at first glance, as rather contradictory. One set of measures (communication acts) fit best with the two cultures account of gender effects in conversation. Certain aspects of the other set (simultaneous speech acts) fit with a status characteristics account. How might this apparent contradiction be explained? One possibility is that measures of communication acts (based on the PPCS) and of simultaneous speech (overlaps and interruptions) tap into different features of conversations. Thus children's use of communication acts may pick out more global features of conversation, a general orientation to conversation or a "meta-strategy". Children may find it difficult to move beyond socialised (gendered) orientations to conversation. Children's use of simultaneous speech acts may in contrast relate to more local argument strategies such as negating, supporting or countering a particular argument, statement or position. Local features of a conversation may be more reactive to situational or contextual features of interaction. In the cut and thrust of debate children may focus on contesting and arguing against *positions* rather than reproducing a particular conversational style.

A final research question explored the relation between the outcomes of conversations and the use of speech acts. Winners used more assertive (collaborative

and controlling) communication acts. Winners also used markedly less affiliation. Losers, in contrast, were very unassertive compared with the other two outcome groups and this was largely due to losers' use of obliging acts. Those arriving at a compromise solution used a high proportion of collaborative acts (a similar amount as was used by winners). However, compromisers used a lower proportion of controlling acts than winners and were, as a result, less assertive. Compromisers were also more obliging and affiliating than winners.

The exploration of the link between conversational style and outcomes points to some interesting patterns. When a child succeeds in imposing their perspective on another this is linked to a conversational style that combines high levels of control with low levels of affiliation. In this task winning is in a very real sense the dominance of one child's perspective. Unsurprisingly, losers (upon whom the other child's perspective is imposed) tend to oblige their partner. Compromisers differ from winners and losers in that there is greater balance between controlling and obliging acts. The proportion of collaboration is the highest in compromiser pairs.

The following excerpt from a conversation, between Jacob (boy) and Sophie (girl), exemplifies the approach of a compromiser pair.

4. Sophie: Well, I think a triangle's 50 because first I thought a square was 50, now I think a triangle is 50. I think we should use a triangle. Two triangles will make 100. [Places two triangles on the table. Looks at A.]

5. Jacob: Sure?

6. Sophie: Yeah, sure.

7. Jacob: I think it's these two [picks up squares]. But what do you think it is?

8. Sophie: I think it's triangles. [Smiles.]

9. Jacob: All right then [puts squares back]. So what are these [points to circles]?

10. Sophie: Circles cost 10.

11. Jacob: How about if we do one, two, three, four, five, six, seven, eight, nine, ten [counts out circles]?

12. Sophie: Yeah. [Nods. Both children place five circles in the container].

Given her clarity later in the conversation, Sophie's early confusion may in fact be a deferential (or obliging) conversational gambit (line 4). Jacob, though, is careful to establish Sophie's real beliefs with a series of questions (lines 5, 7, 9 and 11). These collaborative acts ensure that Jacob retains a degree of assertiveness in the conversation. But Jacob is also keen to agree a solution that Sophie is happy with, an approach that contrasts sharply with the earlier conversation of Sam and Rachel.

The analysis of outcomes and conversations raises at least two further questions. First, are there variations by gender and pair type in terms of outcomes? For instance, do boy and girl winners share similar conversational styles and are these styles equally effective in same-gender and mixed-gender pairings? Second, our analysis examined conversations on an epistemically neutral task; neither perspective (triangle or square equal to 50) was correct or truer than the other. However there is some evidence to suggest that the epistemic content of different perspectives may interact with gender to affect conversational dynamics (such as tests of conservation or moral reasoning, see Leman, 2002; Leman & Duveen, 1999). In this respect studies of peer learning and tutoring need also to consider the nature of any agreement or resolution that is reached: win-lose resolutions might present different learning opportunities and entail very different developmental consequences from compromise resolutions (and in turn social compromises).

Some caution should, however, be applied when extending these findings to account for all children's interaction. Firstly, children in the study formed a multi-

ethnic sample and the potential impact of status characteristics or discourse styles that are attributable to ethnicity remains a possible source of noise in the current data (although in the current study the impact of ethnicity was, at least to some extent, mitigated by the random allocation of children to pairings). Additionally, some research has suggested that there may be differences in gender relationships between children from different ethnic groups (e.g. Kovacs, Parker and Hoffman, 1996). A further source of limitation stems from the task we used. A key feature of our task was that it allowed us observe the consequences of contrasting perspectives and how children sought to resolve these differences. Yet in creating these contrasting perspectives we also created the grounds for a certain type of conflict that may have pressed children into using certain forms of discourse that are more common in disputes concerning competing knowledge claims. Thus our measures of conversation and outcome might pick up on patterns more typical of formal educational activity contexts and less typical of naturally occurring interactions between friends at play. A final note of caution concerns the observation that, from preschool, children seek out interaction more often with same gender peers (Jacklin & Maccoby, 1978). Thus by 8 years children may be far more experienced engaging in same gender interaction than mixed gender interaction and this may, in turn, affect their reactions to and behavior with their peers in conversation.

The results from this study illustrate that gender is a powerful source of influence in children's conversations. This influence extends to the strategies of communication that children bring to conversations and to the ways in which they address their own and each other's arguments and resolve differences in perspective. The current study confirms previous findings concerning the influence of gender on children's conversations. These influences may work on two levels: the strategies boys and girls

bring to arguments appear to differ as a result of socialisation experiences, but in the cut-and-thrust of conversation gender relations also lead to differences in status between children. Finally, the ways in which agreement is achieved should be considered alongside the form of agreement that is achieved. Consideration of the latter reminds us that not every episode of peer collaboration is necessarily an effective means of producing mutual benefits of interaction; sometimes, for instance when one child's perspective dominates or children reach a social compromise, a solution may constitute an inadequate resolution for at least one child.

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Table 1. Mean proportions of communication acts and simultaneous speech acts for

boys and girls in same and mixed gender pairs and associated univariate

effects

	Same gender pairs				Mixed gender pairs			
	Boys	Girls	F	η^2	Boys	Girls	F	η^2
	(n=40)	(n=40)	(1,78)		(n=20)	(n=20)	(1,38)	
	M SD	M SD			M SD	M SD		
Communication acts								
Collaborative	.38 .32	.45 .24	1.15	.02	.28 .26	.40 .28	1.86	.05
Obliging	.20 .29	.26 .27	.90	.01	.21 .26	.37 .29	3.24	.08+
Controlling	.38 .36	.29 .26	1.64	.02	.40 .36	.22 .26	3.18	.08+
Withdrawing	.03 .11	0 0	4.19	.05*	.11 .28	.02 .07	2.23	.06
High affiliation[a]	.59 .37	.71 .26	3.13	.04	.49 .35	.76 .28	7.22	.16*
High assertion[a]	.76 .30	.74 .27	.12	0	.68 .35	.62 .28	.37	.01
Simultaneous speech acts[b]								
Overlaps	.42 .45	.21 .37	5.28	.06*	.32 .45	.32 .37	0	0
Positive interruptions	.14 .29	.14 .32	0	0	.14 .32	.13 .22	.05	0
Negative interruptions	.21 .35	.23 .37	.02	0	.44 .47	.31 .38	.94	.02

Note: Cohen's conventions (Cohen, 1988) for η^2 are that .01 indicates a small effect

size; .06, a medium effect size; .14 or more, a large effect size.

[a] Means for high affiliation and high assertion only are reported. Corresponding values

for low affiliation and low assertion will sum to 1.00 for each of these binary

distinctions.

[b] Means for simultaneous speech acts do not sum to 1.00 for each column because

some children did not use any overlaps or interruptions.

* $p<.05$; +$p<.10$

Table 2. Speaker gender, partner gender and interaction effects relating to proportional

use of communication acts and speech acts

	Speaker gender	Partner gender	Interaction
	$t(118)$	$t(118)$	$t(118)$
Communication acts			
Collaborative	1.80*	-.47	-5.79***
Obliging	1.96*	-.89	.11
Controlling	-2.14*	.71	-5.63***
Withdrawing	.13	.48	-1.27
High affiliation[a]	2.53**	-.97	-.15
High assertion[a]	-.52	.15	-10.21***
Simultaneous speech acts			
Overlaps	-4.88***	-4.88***	-19.77***
Positive interruptions	-.28	.28	-1.18
Negative interruptions	-7.91***	3.49**	-16.98***

Note: For speaker and partner gender effects a positive value of t reflects a higher

score for girls than boys. A positive value of t in the interaction effect indicates a

greater gender difference in same-gender than in mixed-gender pairs.

[a] Analyses for low affiliation and assertion simply reproduce those for high affiliation

and assertion for these binary distinctions.

*$p<.05$. **$p<.01$. ***$p<.001$.

Table 3. Mean proportions of communication acts by conversation outcome (winner,

loser or compromiser)

	Winners		Losers		Compromisers[a]	
	($n=36$)		($n=36$)		($n=48$)	
	M	SD	M	SD	M	SD
Communication acts						
Collaborative	.43	.32	.29	.22	.44	.27
Obliging	.06	.11	.47	.28	.23	.25
Controlling	.49	.34	.21	.25	.29	.29
Withdrawing	.01	.05	.04	.15	.05	.17
High affiliation[b]	.49	.34	.76	.30	.67	.31
High assertion[b]	.93	.12	.49	.28	.72	.29

[a] Includes compromisers (40) and social compromisers (8)

[b] Means for high affiliation and high assertion only are reported. Corresponding values

for low affiliation and low assertion will sum to 1.00 for each of these binary

distinctions.

Footnotes

[1]However, as Anderson & Leaper (1998a) note, many studies including Esposito's fail to distinguish the various forms of simultaneous speech act.

[2] Preliminary analyses revealed no effects relating to teacher ratings of mathematical ability – either in terms of conversational style or outcomes. This is, perhaps, unsurprising because all children could easily perform the simple addition calculation required to complete the task as was evidenced by their performance on pre-interaction tasks.

[3] All names are pseudonyms.