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# Social Determinants of Social-Cognitive Growth in Children: The Effects of Racial Group and Friendship

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ABSTRACT

Social Determinants of Social-Cognitive Growth in Children: The Effects of Racial Group and Friendship

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The present thesis examined the influence of two social dimensions, racial group and friendship, on social-cognitive growth following a sociocognitive conflict. Two experiments tested the hypothesis that perceived similarity along these dimensions facilitates social-cognitive growth, following the experience of a sociocognitive conflict with a peer.

In Experiment 1, subjects were 90 children aged 6 to 10 years belonging to two racial groups, White and Black. In Experiment 2, subjects were 94 children aged 6 to 10 years who had at least one reciprocal friend. Subjects were first administered social distance measures to assess their perceptions of the similarity and competence of, and preference for photographed children who were of the same and other race (Exp. 1), or who were friend and nonfriend classmates (Exp. 2). They were then administered a developmental measure of social perspective-taking skills (Marsh, 1982), prior to and following a sociocognitive conflict. In Experiment 1, the conflict was induced by a problem solution which conflicted with the subject's own, and which was supposedly given by a peer of the same or other race. In Experiment 2, pairs of friends or nonfriends discussed their differing solutions to an interpersonal dilemma.

Children were found to differentiate peers along the dimensions of racial group and friendship. In general, children perceived same-race or friend peers to be more similar to themselves and more competent than other-race or nonfriend peers, and they preferred same-race or friend peers as playmates. Despite the differentiation of peers along the dimensions under study, results of both experiments failed to support the hypothesis that similarity in racial group and friendship facilitates social-cognitive growth following a sociocognitive conflict. In Experiment 1, all children progressed from pretest to posttest, regardless of the race of peer with whom they experienced the sociocognitive conflict. In Experiment 2, only children in grade 3-4 who had a less mature answer than their partner at pretest progressed at posttest, whether or not they experienced the sociocognitive conflict with their friend or their nonfriend. The results concerning children's perceptions of their peers are consistent with previous findings, and are discussed in terms of developmental and social factors. The outcomes of the sociocognitive conflict in Experiment 1 and Experiment 2 fail to support the hypothesis that perceived similarity along the dimensions of racial group and friendship facilitates social-cognitive growth in children. Social, developmental, and experimental factors which are hypothesized to affect the results are discussed.

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## General Introduction

A recent focus of research on social and moral development has been the facilitating role of social interaction (Bearison, Magzamen, and Filardo, 1986; Damon and Killen, 1982; Haan, 1985; Turiel, 1974; Walker, 1982; 1983). In these studies, cognitive conflict created by an opposition of opinions during peer interaction has been identified as facilitating the transition to a higher level of reasoning about social-cognitive or moral problems. Though investigation of the role of cognitive conflict in promoting moral and social growth is fairly recent, it is a key concept in the theory of cognitive development developed by Piaget (1932; Piaget and Inhelder, 1969) and elaborated by Doise and his collaborators (Doise and Mugny, 1981; Doise and Palmonari, 1984; Mugny, DePaolis, and Carugati, 1984). Whereas Piaget proposed that cognitive conflict encountered during social interaction leads to cognitive growth, these recent scholars add that social factors mediate the degree of cognitive growth.

The present thesis tests the hypothesis that social factors influence the outcome of sociocognitive conflict between two children. Two experiments examine the influence on social-cognitive growth of two social dimensions, racial group and friendship, along which children have been shown previously to differentiate their peers. A general introduction provides the theoretical and empirical rationale for the two experiments which follow.

## Piagetian Theory of Social Interaction and Cognitive Development

Piaget's theory (1970; Piaget and Inhelder, 1969) states that knowledge at all stages of development arises from interaction with the physical and social environment. The mechanism proposed to stimulate cognitive growth is equilibration or self-regulation of cognitive structures. Equilibration is comprised of two complementary processes: assimilation of new information into existing cognitive structures, and accommodation of prior structures to integrate the new information. Through a continuous process of assimilating and accommodating cognitive structures to integrate information acquired in interaction with the environment, the individual acquires new instruments of action and thought.

According to Piaget (1932), the role of social interaction with peers in cognitive growth is to engender conflict, which functions to throw present cognitive structures into disequilibrium and to initiate the process of self-regulation described above. Piaget defined conflict in terms of two persons' opposition of ideas, which involve comparison, debate, and subsequent cognitive growth. It does not refer to argumentative or aggressive types of interaction as defined by some researchers (e.g., Shantz and Shantz, 1985). In the context of interpersonal interactions, persons with conflicting or opposing ideas may

compare, contrast, and confront one another with their own thinking. The cognitive conflict thus created makes children aware of other perspectives than their own and enables them to evaluate and develop their own reasoning, a process which results in individual growth for one or both of the participants. In contrast to unilateral or complementary relations which characterize adult-child interactions, Piaget proposed that peer relations characterized by equal status, reciprocity, and cooperation, are especially suited to the comparison and debate which engender progress towards morality.

The Piagetian hypothesis that social interaction involving cognitive conflict leads to cognitive growth has been supported by numerous researchers (Ames and Murray, 1982; Botvin and Murray, 1975; Doise, Mugny, and Perret-Clermont, 1975; 1976; Miller and Brownell, 1975; Silverman and Geiringer, 1973). The experimental paradigm most often used to measure cognitive change utilizes Piagetian tasks, for example conservation or spatial perspective-taking. Children at the same or different levels of reasoning are paired in order to discuss and arrive at a common response to a cognitive problem. Following the interaction, they are retested individually in order to evaluate cognitive change. Using this paradigm, Doise et al. (1975) demonstrated the value of social interaction for cognitive growth by showing that 6- and 7-year old children who worked in pairs showed

superior performance to children who worked independently. In a second experiment, they showed that nonconserving children paired with conservers in the context of a conservation of liquid task demonstrated superior performance on a posttest and supplied better justifying explanations than control subjects who had not experienced the interaction. Other studies utilizing the Piagetian experimental paradigm also support the conclusion that social interaction is effective in inducing cognitive development (Ames and Murray, 1982; Doise and Mugny, 1979; Miller and Brownell, 1975; Silverman and Geiringer, 1973).

The above studies demonstrate that social interaction promotes the development of reasoning about physical concepts in 6- and 7-year old children. Sociocognitive conflict has also been examined in older subjects in the development of moral reasoning. Turiel (1974) and Walker (1982, 1983) have both reported findings, for adolescents and for 10- to 12-year olds respectively, which support the view that sociocognitive conflict created by an opposition of opinions and reasoning promotes the transition from one stage of moral reasoning to the next, as measured by Kohlberg's developmental stage-theory (1969). In addition, Haan (1985) showed that social disequilibrium in the context of discussion in university students' friendship groups strongly predicted positive change in moral reasoning.

Whereas the majority of studies utilize an experimental

paradigm involving an interaction between two children, cognitive growth has also been shown to result from a cognitive conflict created by presentation of alternative responses by an experimenter. Lefebvre and Pinard (1972; 1974) demonstrated that pre-operational children who received training sessions involving the presentation of conflicting perspectives to Piagetian conservation problems made greater progress at posttest than children who had not received the training, and maintained their progress at two months followup. Walker (1982; 1983) also reported progress in moral reasoning by 10- and 12-year olds following a sociocognitive conflict induced by an adult. These studies suggest that a cognitive conflict created by alternative responses given by an experimenter also engenders growth.

In the area of sociocognitive conflict and cognitive development, debate has focused on whether the functional mechanism for change is related to disequilibrium and self-regulation of cognitive structures, as proposed by researchers in the Piagetian tradition (e.g., Doise et al., 1975), or due to modeling of the more advanced partner's response, as suggested by Botvin and Murray (1975). Although modeling has been shown to stimulate cognitive growth in the context of social interaction (Botvin and Murray, 1975; Brody and Henderson, 1977), studies also support that progress cannot be explained solely by modeling of the performance of the child at the superior level. For

example, children have been shown to improve in their reasoning about physical concepts even when they are paired for interaction with a child at a lower level of reasoning (Mugny and Doise, 1978), or if the information provoking the conflict is incorrect (Doise and Mugny, 1981; Doise et al., 1976; Perret-Clermont, 1980). Furthermore, children who demonstrate positive change are reported to give different justifications than those they heard during the interaction (Perret-Clermont, 1980), and to demonstrate a generalization of skills acquired during the interaction to unfamiliar tasks (Bell, Grossen, and Perret-Clermont, 1985). Although the presentation of a superior conflicting response may optimize cognitive growth, the process of cognitive restructuring stimulated by presentation of a conflictual point of view, even at the same or inferior level of reasoning, seems also to stimulate change. From this perspective, the effect of modeling may include not only initial imitation or mimicry, but also a cognitive conflict and subsequent cognitive restructuring created by observing an alternative solution to a particular problem.

Whereas most studies have focused on the outcome of peer interaction, two studies have focused on processes during social interaction which facilitate growth. Damon and Killen (1982) analyzed the interactional features of 5- to 9-year old children during peer discussions about hypothetical problems in distributive justice. They found

that the interactions of children who advanced following the peer discussion were characterized by reciprocity, with the children either agreeing with one other or working constructively to extend, clarify, or compromise with each other's statements. In comparison, children who engaged in rejecting, conflictual modes of interaction tended not to advance. Whereas Damon and Killen (1982) suggested that sociocognitive conflict seemed to inhibit change in their subjects, it is important to note that a rejecting, argumentative mode of communication is not identical to the "cognitive conflict" of Piagetian theory, as has been described above. In fact, Damon and Killen's (1982) description of interactions of children who did evidence change is more consistent with Piaget's hypothesis, in that their interactions were characterized by a reciprocal quality of acceptance, comparison, and transformation of one another's ideas.

Similar to Damon and Killen (1982), Bearison, Magzamen, and Filardo (1986) found that a moderate degree of conflict was associated with optimal change in 5- to 7-year olds working on a spatial perspective task. Their results also indicate that a relatively balanced pattern of disagreements between partners leads to greater cognitive gains than interactions in which one partner dominates the other. These two studies suggest that cognitive growth is facilitated when cognitive conflicts occur within a

cooperative social context in which each partner contributes equally to the discussion of opposing viewpoints.

In summary, research supports the proposition that peer interaction involving cognitive conflict promotes cognitive growth in both children and adolescents, and in the development of reasoning about both physical and moral concepts. Analyses of the processes of social interaction are consistent with Piaget's notion that cognitive growth is facilitated by children's comparison and elaboration of opposing ideas, within an atmosphere of reciprocal interaction and cooperation.

## Social Psychological Elaboration of Piagetian Theory

Whereas Piaget proposed that interaction with peers in general elicits cognitive conflict and growth, scholars working within the Piagetian framework have been intrigued by findings that not all children in their samples progress in their reasoning following the sociocognitive conflict (Bell et al., 1985; Doise et al., 1975; Mugny and Doise, 1978). In keeping with the findings of Damon and Killen (1982) and Bearison et al. (1986), exceptions to the general rule that peer interaction stimulates cognitive growth have led scholars (Bell et al., 1985; Doise and Mugny, 1981; Doise and Palmonari, 1984; Mugny et al., 1984) to elaborate on the original theory to propose that social interaction does not necessarily lead to individual development, but rather, that cognitive growth is mediated by social factors

during the interaction.

Within this theoretical framework, Mugny et al. (1984) propose that the central condition for growth is an opposition of divergent cognitive responses within a social interaction which facilitates rather than inhibits cognitive change. Specifically, progress is hypothesized to occur when an individual encounters a person who holds a different perspective from his/her own, but with whom s/he still feels the need for a common understanding and resolution of the conflict (Bell et al., 1985). From this perspective, the cognitive conflict proposed by Piaget may be viewed as a sociocognitive conflict because of the social disagreement which is inherent in the interaction.

According to Mugny et al. (1984), resolution of a sociocognitive conflict may be either cognitive or social in nature. Within a facilitory social interaction, the sociocognitive conflict is transposed to the cognitive domain, in which case one or both of the children consider the response of the other child as a valid alternative to their own. They may then utilize the response of the other as a point of anchorage for a new construction, discuss their opposing responses, and in this way resolve the conflict by cognitive growth by one or both of the partners. In contrast, resolution of a sociocognitive conflict in the "relational" or social domain is hypothesized to inhibit progress because the motivation to

terminate the social conflict is stronger than the motivation to understand the problem and achieve a more mature level of reasoning.

Three processes of conflict resolution are suggested for which a relational regulation supercedes a cognitive regulation to a socio-cognitive conflict: social differentiation, conformity, and normalization. Social differentiation involves the affirmation or creation of a social difference to which to attribute the cognitive disagreement. It may occur in situations where the child perceives him/herself as dissimilar to the social partner, for example according to an external dimension such as ethnicity, gender, or age, or according to an internal dimension such as interests or attitudes. This process is hypothesized to inhibit the transposition of the conflict to the cognitive domain, and the subsequent comparison and debate which lead to cognitive restructuring at a higher level of reasoning. Instead of solving the problem on a cognitive level, attribution of the discord to a social difference enables the child to disregard the disagreement as due to irreconcilable social factors, and to ignore the partner's opposing response as a potentially valid perspective for a new cognitive construction.

The second form of relational regulation, conformity, refers to a resolution of a sociocognitive conflict within a power relationship, in which the lower status partner

explicitly adopts or mimics the response of the higher status partner, without subsequent cognitive restructuring (Mugny et al., 1984). Conformity is hypothesized to occur in complementary relationships in which one partner's action must conform to the dictates set down by the other's rules, usually in return for social approval (Youniss, 1983). For example, children have been demonstrated to adopt an adult's response, whether correct or incorrect, without progressing subsequently (Mugny et al., 1984). On the other hand, the adult's style of interaction has been shown to mediate the impact of the social asymmetry (Carugati, De Paolis and Mugny, 1980-1).

The goal of social differentiation and of conformity is the avoidance of social discord, which may also be produced by a third process, normalization. This process refers to the avoidance of social comparison, involvement, and conflict by forms of compromise such as a juxtaposition of responses or a division of labour in which the decision is shared. Mugny et al. (1984) suggest that this modality will more likely emerge among peers than in adult-child pairs, and when the social situation precludes other forms of social regulation such as conformity or social differentiation. A lack of involvement by one or both children in the negotiations may indicate this type of inter-individual convergence (Mugny and Doise, 1979). Like social differentiation, normalization enables each partner

to retain his/her own perspective without experiencing the cognitive disequilibrium which would lead to progress, for example by concluding that the answers given by both children are correct.

To date, research conducted within the theoretical paradigm of social interaction and cognitive growth has focused on demonstrating the general effectiveness of sociocognitive conflict in generating cognitive change, as has been described above. Researchers have only recently begun to examine social factors which facilitate or inhibit progress. One approach to the study of social variables in cognitive development is exemplified by the work of Bearison et al. (1986) and Damon and Killen (1982), who examine processes of interaction of pairs of children in general, without regard for a priori differences between pairs of children. A second approach is exemplified by scholars in the Piagetian tradition who examine social differences which mediate progress in the experimental task situation. For example, Perret-Clermont and Schubauer-Leoni (1981) investigated the relation between socioeconomic class level, sex, and children's responses to the testing situation in which cognitive development is elicited. They presented children from low and middle socioeconomic status groups with a conservation of liquid task involving the equal sharing of juice between the subject and the experimenter versus between two dolls. Results that girls

and socially disadvantaged children performed significantly better with the experimenter than with the dolls led these authors to suggest that children belonging to these social groups perceived the experimental situation differently than did boys and socially advantaged children, and that their perceptions affected their development of a cognitive competence.

Several studies (e.g., Light, Buckingham, and Robbins, 1979; McGarrigle and Donaldson, 1975; Rose and Blank, 1974) have also manipulated contextual variables in the experimental procedure and have reported that children's perceptions of the experimenter affect the outcome of a sociocognitive conflict. For example, McGarrigle and Donaldson (1975) measured the acquisition of conservation of length and number in 4- to 6-year old children under two conditions: when the transformation occurred because of a direct action by the experimenter and when it happened "accidently" as a by-product of the random behavior of a toy teddy bear. A significantly greater number of children achieved conservation when the transformation was "accidental" than when the transformation was intentional. The authors interpret their results as evidence that characteristics of the experimenter's behavior in relation to the task materials can influence children's interpretation of the task and their elaboration of a new cognitive competence.

The theoretical and experimental paradigm of the present thesis is consistent with the second approach to the investigation of social regulations in cognitive development, that is, the study of social factors which influence children's interpretation of the experimental context, thus mediating the outcome of sociocognitive conflict. The thesis differs from previous work by its focus on children's perceptions of the partner with whom they engage in the sociocognitive conflict, rather than on their perceptions or interpretation of the experimental context or experimenter. The author hypothesized that in a paradigm involving a sociocognitive conflict between peers, children's perception of their partner would affect social-cognitive growth.

Based on the theory of Doise and Palmonari (1984) and Mugny et al. (1984), the mediating role of perceived social differentiation between children was the focus of study. This process was operationalized by focusing on two social dimensions along which children have previously been shown to differentiate among their peers: racial group and friendship. Two experiments were conducted to test whether perceived similarity along these dimensions facilitates individual social-cognitive growth following a sociocognitive conflict. Social-cognitive growth was assessed using scores on a developmental measure of interpersonal problem-solving (Marsh, 1982), which measures

children's perspective-taking ability in two social contexts. This measure was chosen because it was appropriate for children between the ages of 6 and 10 years, and because it was hypothesized that the social dimensions of racial group and friendship would be likely to affect growth in the social-cognitive domain of development.

## Experiment 1

## Racial Attitudes in Children and the Influence of Racial Group on Social-Cognitive Growth following a Sociocognitive Conflict

The first experiment examines the influence of the social dimension of racial group on social-cognitive growth following a sociocognitive conflict. This dimension was chosen for study because of current interest in the social and developmental factors that affect attitudes towards one's own and other ethnic groups (Aboud, 1987; Aboud, 1988; Aboud and Skerry, 1984; Branch and Newcombe, 1988; Doyle, Beaudet, and Aboud, 1988; Katz, 1976). Perceptions of similarity/dissimilarity of children of different ethnic groups have been shown to be related to positive and negative attitudes towards different ethnic groups (Doyle, Aboud, and Sufrategui, 1988-89; Doyle et al., 1988; Katz, Sohn, and Zalk, 1975). The present study hypothesized that perceptions of similarity/dissimilarity of racial group would also mediate the extent to which children mature in their social-cognitive reasoning as a result of hearing opinions given by same-race versus other-race peers, through the mechanism of social differertiation.

In the following sections, a brief review of the literature on the development of racial attitudes in children is presented, followed by the rationale for studying the dimension of racial group in the context of

cognitive growth following sociocognitive conflict.

Racial Attitudes Development in Children

Most of past research on racial attitudes in children has been conducted with the goal of examining and reducing prejudice, and has focused on preference as the main dimension. Race has been shown to be a salient factor in determining attraction in adults (Berscheid and Walster, 1978). Racial similarity affects children's friendships, although similarity in sex accounts for more of the variance in children's friendship choices (Singleton and Asher, 1977; Taylor and Singleton, 1983).

Aboud and Skerry (1984) and Aboud (1988) provide recent reviews of the literature on the development of ethnic attitudes. These reviews indicate that majority White and minority Black children show different patterns of development of racial attitudes, with White children showing a more consistent pattern of same-race and other-race preferences than Blacks.

Research on White children shows that from the age of 3 to 7 years, Whites show increasingly strong preferences for play with White peers and for positive evaluations of Whites (Asher and Allen, 1969; Clark, Hocevar, and Dembo, 1980; Crooks, 1970; Greenwald and Oppenheim, 1968; Hraba and Grant, 1970; Kircher and Furby, 1971; Morland, 1966; Williams, Best, and Boswell, 1975). Some studies show a decline in own-group preference throughout later childhood

and adolescence (Kalin, 1979; Rice, Ruiz, and Padilla, 1974; Zinser, Rich, and Bailey, 1981), whereas others report no change (Aboud, 1977; Epstein, Krupat, and Obudho, 1976; Fox and Jordan, 1973; Genesee, Tucker, and Lambert, 1978). With respect to attitudes toward other groups, studies which use continuous rating scales, rather than more extreme forced-choice procedures similar to that developed by Clark and Clark (1947), report moderately negative other-group attitudes expressed by 5- to 7-year old White children toward Black and other minority groups (Aboud, 1977; 1980; Aboud and Mitchell, 1977; Genesee et al., 1978). With age, White children show an increase in positive other-group attitudes (Aboud, 1980; Clark et al., 1980; Davidson, 1976; Fox and Jordan, 1973; George and Hoppe, 1979; Williams et al., 1975).

For Black children, preference appears more variable than for White children. Approximately one-fourth of the studies reviewed by Aboud and Skerry (1984) show own-group preference by Blacks (e.g., Aboud, 1980; Fox and Jordan, 1973; LeVine and Ruiz, 1978; Spencer, 1982; Ward and Braun, 1972). A lack of consensus on preference is reported in over half of the studies (e.g., Branch and Newcombe, 1980; Greenwald and Oppenheim, 1968; Klein, LeVine, and Charry, 1979; Moore, 1976), and a White preference is reported in the remainder (e.g., Crooks, 1970; Davey and Mullin, 1980; Rice et al., 1974; Rohrer, 1977). With respect to age

changes in Black children, some studies indicate an increase in Black preference (e.g., Asher and Allen, 1969; Fox and Jordan, 1973; Hraba and Grant, 1970; Spencer, 1982), whereas others report no change (e.g., Aboud, 1980; Epstein et al., 1976; Katz et al., 1975; Williams et al., 1975). Studies which examine other-group attitudes in Black children show that by the age of 4 years, Black children express either a preference for Whites (Asher and Allen, 1969; Clark and Clark, 1947; Crooks, 1970; Greenwald and Oppenheim, 1968; Williams et al., 1975), equal liking of Whites and Blacks (Branch and Newcombe, 1980; Spencer, 1982; Williams et al., 1975), or less positive evaluations of Whites than of Blacks (Aboud, 1980; Hraba and Grant, 1970; LeVine and Ruiz, 1978; Teplin, 1976; Ward and Braun, 1972). With respect to age changes, some studies show an increase with age in Black preference and a decline in White preference (Asher and Allen, 1969; Davey and Mullin, 1980; Fox and Jordan, 1973), whereas other studies report no age change in White preference (Williams et al., 1975) or in Black preference (Katz et al., 1975). When assessed independently of own-group attitudes, attitudes toward others have been shown to become more favorable (Aboud, 1980).

Three types of explanations have been proposed to explain ethnic attitudes (Aboud, 1988). Social reflection theory views ethnic attitudes as reflecting the structure of our society, such that groups which hold different power and

status are valued differently. Prejudicial attitudes are thus expected to be inversely related to the group's position on the social hierarchy (Morland and Suthers, 1980; Sherif and Sherif, 1969; Tajfel, 1978). According to this theory, children adopt the ethnic attitudes of their parents and of significant others, either through imitation, identification, or a desire to please (Aboud, 1988). The strength of this theory is its ability to explain why some groups are the targets of prejudice and others are not. In a stratified society, however, social reflection theory predicts that majority-group children would initially be non-prejudiced and would become more prejudiced with age, a prediction which is clearly not supported by the empirical research cited above.

A second type of explanation proposes that prejudice is a result of unresolved internal conflict, specifically the projection of unresolved anger towards the parents onto members of less powerful social groups (Adorno, Frenkel-Brunswick, Levinson, and Sanford, 1950). This theory proposes that an authoritarian parenting style will result in greater prejudice because of the inability to learn adaptive ways to express one's hostility, hostility which is enhanced by punitive parenting. The strength of this theory is its ability to explain individual differences in prejudice; it makes no predictions, however, about age changes in ethnic attitudes, nor about the targets selected

for prejudicial attitudes.

A third explanation of ethnic attitudes in children is given by social-cognitive developmental theory, which proposes that developmental processes underlie changes in ethnic attitudes during childhood (Aboud, 1988; Katz, 1976). Aboud (1988) explains the development of ethnic attitudes in terms of two overlapping sequences of development. The first sequence involves a progression in the child's differentiation from affective, to perceptual, to cognitive processes. The second sequence involves a shift in focus of attention from self to groups to individuals. The implication of these developmental sequences for ethnic attitudes is that at any age the child's attitude will be determined by his/her present levels of processing of information and focus of attention.

Social-cognitive developmental theory explains the extreme polarization of attitudes by children younger than 5 years, that is at the first step in the sequence, as due to differentiation along an affective, positive-negative dimension, with focus on implications for the self (i.e., differences from the self and from significant others arouse fear and are therefore judged bad). At the second step, children rely on perceptions of similarity and dissimilarity of external attributes such as skin colour, hair texture, language, and clothing. A concurrent focus on groups allows children to identify themselves by noting to whom they are

similar, and from whom they are different. At the third step, cognitive understanding develops such that children understand the categories and bases of ethnicity (e.g., ancestry), and the psychological qualities which differentiate among people on an individual level. Due to the ability to attend simultaneously to two or more different perspectives, they can also understand that two people can differ in their ethnicity and both be good or right.

Aboud suggests that by 8 to 10 years, children possess the necessary cognitions to enable them to hold accepting and nonprejudiced attitudes towards individuals belonging to different ethnic groups. For majority White children, this means that other-group attitudes can become more positive; for minority children, own-group attitudes can also improve. Aboud and Skerry (1984) suggest that the difference between White and Black children in their pattern of attitude development may be related to social factors such as the status of the ethnic group in the community. Consistent with social reflection theory, early preferences of Black children for Whites may reflect social values about which race is dominant, and perhaps a preference as to which race they would like to belong. This preference may be corrected when perceptual and cognitive processes mature and children identify with their own race and understand that ethnic differences need not be accompanied by unequal

value (Aboud, 1988).

From a cognitive-developmental perspective, three studies have examined perceptual concomitants of ethnic attitudes in children. Katz et al. (1975) assessed perceived within-group and between-group similarity for Blacks and Whites by asking 6- to 10-year old White and Black children to make judgements of similarity/difference for pairs of photos and drawings of faces which systematically varied along a number of physical dimensions. Subjects indicated perceived similarity/dissimilarity on an 11-inch board where pairs placed closer together indicated greater similarity. Perceived within-group similarity was measured for pairs of faces which varied according to the dimensions of facial expression, type of hair, shape of eyebrow, and presence or absence of eyeglasses. Perceived between-group similarity was measured for pairs of faces of White and Black children.

For White children, perceived between-group similarity increased with age and perceived within-group similarity decreased with age. This pattern suggested to Katz an increasing focus with age on non-race related indices of differentiation between people. For Black children, both Black-White differences and cues not associated with race were perceived in a relatively constant manner across the age range. The findings of this study support cognitive-developmental theory for White children but not

for Black children. The authors attribute the race difference in patterns of perception of between-race and within-race differences to the emphasis placed by our society on racial cues for Black children, such that the race-related differences continue to be salient.

Doyle et al. (1988) studied children's perceptions of similarity between their own and a different ethnic group. English-speaking Canadian children in grades kindergarten to 6 assigned positive and negative attributes to one of 3 same-sex pictures, depicting either an English-speaking child, a French-speaking child, or both an English and a French-speaking child. Both positive attributions to the child's own ethnic group and negative attributions to the other ethnic group decreased with age, with significant differences between grades 1 and 6. Perceived similarity of the two ethnic groups, assessed indirectly by attributions to both English and French speaking children, increased significantly with age, again with significant changes between grades 1 and 6.

In another study, Doyle et al. (1988-89) examined age differences in children's attitudes towards children of their own and other ethnic groups. White children in grades kindergarten and 3 were administered three tasks which measured perceptions of similarity/dissimilarity and attitudes towards Blacks, Native Indians, and Whites. Consistent with the findings of Doyle et al. (1988),

positive attributions to other ethnic groups and negative attributions to their own group increased with age. This age change was accompanied by greater perceived similarity by older children between their own and the other ethnic groups.

The results of Doyle et al. (1988; 1988-89) are consistent with those reported by Katz et al. (1975) for White children, and support cognitive-developmental theory. The findings with regard to perceived similarity of positive and negative attributes also reflect patterns demonstrated for the dimension of preference, that is, a decrease with age in own-group positive attitudes and in other-group negative attitudes, with younger children exhibiting a more extreme positive-negative polarization between their own and the other ethnic group.

To summarize, research to date on ethnic attitudes shows that children differentiate their peers along the social dimension of racial or ethnic group, and that their preferences and perceptions of similarity between their own and different groups change with age. White children tend to hold a strong preference for their own group and negative attitudes towards other groups until the age of 6 or 7 years. After this age, own-group preference decreases, accompanied by a more positive attitude toward other groups. An increase in perceived similarity between racial groups accompanies the increase in positive other-group

attitudes. Studies of Black children are less consistent in their reports of preferences before 5 years of age. With increasing age, however, studies show an increase in positive attitudes towards Blacks and towards other groups. In contrast to White children, one study (Katz et al., 1975) suggests that Black children do not show age changes in perceived similarity between and within racial groups. Results for majority White children support cognitive-developmental theory, whereas results for Black children suggest that the development of ethnic attitudes for minority-group children is complicated by social factors.

Rationale for the Present Study

As reviewed above, research on ethnic attitudes demonstrates that in their preferences and perceptions of similarity, children differentiate between same-race and other-race peers. Given this knowledge, the present study examines the influence of racial group on the outcome of sociocognitive conflict between children. In simple terms, the question asked by the present study is whether children learn equally well from peers of the same versus a different race as themselves.

The hypothesis that racial group influences social-cognitive growth is based on the proposal by Mugny et al. (1984) that the process of social differentiation mediates cognitive growth. In the present study, it was hypothesized that the degree of perceived similarity versus

dissimilarity in racial group between peers would mediate the extent to which children consider the opinion of the peer to be a valid alternative to their own. With greater perceived similarity of the peer in racial group, children were expected to be less likely to resolve a sociocognitive conflict by social differentiation and more likely to consider the differing opinion as a valid anchor for a new cognitive construction. Pairing with a same-race peer rather than with an other-race peer was thus expected to result in greater social-cognitive growth following a sociocognitive conflict.

Based on cognitive-developmental theory, a secondary hypothesis was that the process of social differentiation would operate differently for children of different ages. Specifically, it was thought that social differentiation would be most likely to operate for children between the ages of 6 and 8 years, for whom the perceptual dimension of race is highly salient. Children of this age would be expected to focus less than older children on internal and individual characteristics of peers. Their external focus of attention would thus lead them to use race as a dimension along which to judge similarity on social-cognitive judgements, and hence along which to socially differentiate in resolving a sociocognitive conflict. In contrast, older children would be expected to differentiate less between same-race and other-race peers along the dimension of race,

in favour of more internal dimensions of comparison. They would thus to be more likely to consider the conflictual answers of both same-race and other-race peers as valid alternatives to their own, and to progress following a sociocognitive conflict with a child of either race.

From the theoretical perspective of Doise and Palmonari (1984) and Mugny et al. (1984), perceived similarity of racial group was the main social dimension examined as a potential basis for social differentiation. For purposes of exploration of other aspects of attitudes which might be related to the resolution of sociocognitive conflict, two other dimensions were also examined. First, on the basis of the ethnic attitudes literature which demonstrates that children differentiate same-race from other-race peers along the affective dimension of preference, this dimension was examined. Consistent with previous work, White children were expected to show a same-race preference that would attenuate with age. Given the age range of the subjects, that is 6 to 10 years, Black children were also expected to show a same-race preference that would either remain the same or increase with age. It was hypothesized that greater preference for the partner would result in greater social-cognitive growth following a sociocognitive conflict.

In addition, the author hypothesized that the dimension of perceived academic competence of the self versus the peer might be a basis for social differentiation in

social-cognitive judgements and hence influence the outcome of a sociocognitive conflict. Although peer relations in general are characterized by equal status (Piaget, 1932), it was hypothesized that children may perceive status differences between majority White and minority Black groups in North American society, and that these perceptions would be reflected in their ratings of school or academic competence. In the context of sociocognitive conflict, perceptions of academic competence would thus mediate the extent to which children consider the conflicting response of the peer to be a valid alternative to their own, and use it as a valid anchor for a new construction. It was hypothesized that perceptions of lower academic competence of a peer would increase social differentiation in response to a sociocognitive conflict.

Based on the theoretical perspective of Mugny et al. (1984) and on the research literature on the development of racial attitudes in children, the following hypotheses were generated for investigation in the present study:

(1) That in their perceptions, children would differentiate same-race from other-race peers. More specifically, it was hypothesized that children would perceive peers of the same race to be more similar to themselves, and would prefer to play with peers of the same race as themselves. Based on previous work on the development of ethnic attitudes, younger White children were

expected to show a stronger preference for same-race peers than Black children and than older White children. If perceived academic competence reflects social status differences, majority White children were expected to be rated as more competent than minority Black children.

(2) That racial group of peer would influence social-cognitive growth following sociocognitive conflict. Specifically, given the tendency to utilize social differentiation as a resolution to the sociocognitive conflict with other-race peers, children were expected to show more social-cognitive growth following presentation of a more mature alternative answer to a social perspective-taking problem given by a same-race versus an other-race peer. A secondary hypothesis based on cognitive-developmental theory was that this effect would be stronger for younger than for older children.

## Method

### Subjects

Ninety boys and girls in grade 1-2 (mean age = 7 yrs 6 mths) and grade 3-4 (mean age = 9 yrs 4 mths) and belonging to two racial groups, Black and White, participated in the study. The Black children were of Haitian origin, and the White children were primarily of French-Canadian and Italian origin. The children were in attendance at two French language schools in the greater Montreal area, chosen for their populations of Black and White children coming from

families of similar socioeconomic level. All children were fluent in French. Socioeconomic status, evaluated on the basis of parental employment and education according to Hollingshead (1975), was found to differ significantly for the two racial groups, $F$ (1,81) = 7.31, $p < .01$. A mean score of 33.65 (s.d. = 10.81) for White children indicates that on average, they came from families of skilled craftsmen and clerical and sales workers. A mean score of 27.98 (s.d. = 8.74) for Black children indicates that they were lower in SES than the white children, on average from families of machine opera- tors and semi-skilled workers. The Black children formed a minority group in both schools, with approximately 15% and 17% of children being Black in grades 1 to 4 at each school. A breakdown of subjects by grade, sex, and race is given in Table 1. Written parental consent was obtained for all participating children. Parental consent letters are in Appendix A. Of a total of 498 letters sent to parents of children in the two participating schools, the response rate was 62.4%, with a 54.6% agreement rate and a 7.8% refusal rate.

Measures

Race Perception Task. The Race Perception Task, a modified version of the Social Distance Measure used by Katz et al. (1975) and Verna (1981, 1982), was used to assess the degree of perceived similarity, preference, and perceived competence in a favorite school subject between each subject

Table 1

Sample Frequencies for Study 1 by Grade, Sex and Race (N = 90)

| | Race | |
|---|---|---|
| | White | Black |
| Grade 1-2 | 22 | 21 |
| Boys | 10 | 9 |
| Girls | 12 | 12 |
| Grade 3-4 | 24 | 23 |
| Boys | 12 | 11 |
| Girls | 12 | 12 |
| Total | 46 | 44 |

and children of the same and different race. Verna (1982) reports a split-half reliability coeffi-cient of .77, and using the Spearman-Brown formula, an esti-mated reliability of .87 for the original 16 item test, showing that children respond in a highly consistent fashion to the test.

Materials for this measure included a 60-cm. cardboard, marked off by 20 equidistant lines, and sixteen 3 1/2" by 5" colour photographs of Black and White boys and girls. Photographs were obtained by asking parental permission to photograph children at a YMCA, two Montreal shopping centres, and a church group. The Black children shown in the photographs were Haitian Blacks, thus they were of similar origin to the subjects used in the study. The sixteen photographs were chosen from a pool of 49 photographs on the basis of appropriate estimated age (i.e., 6 to 10 years old) and equal ratings in attractiveness by 20 male and female adult raters (10 White, 10 Black). An analysis of variance showed that in the final sample of 16 photographs, the four groups of photographed children differing in race and sex did not differ in mean rated attractiveness ($F$ (3,48) = 1.57, n.s.).

In order that the results generalize beyond an individual photographed child (Aboud, 1988), several photographs of children of each race were used. Specifically, each subject was shown six photographs of same-sex children, three same-race and three other-race than

him/herself. Of the three photographed children of each race, two had been judged by the raters to be in the same age-group as the subject, and one had been judged to differ in age from the subject by 1-2 years. Thus, subjects in grade 1-2 were shown four photographs of same-age children, two White and two Black, and two photographs of older children, one White and one Black. Subjects in grade 3-4 were shown four photographs of same-age children, two White and two Black, and two photographs of younger children, one White and one Black. The use of stimuli depicting both younger and older children made possible the use of overlapping sets of photographs for the two age-groups of subjects. This procedure reduced the probability that age differences in results would be attributable to differences in the photographs per se.

The measure consisted of four items. The first item was used to verify accurate racial identification by asking the subject whether s/he is Black or White. Since no child misidentified his/her own race, no subject was excluded from the study for this reason. In the next three questions, the subject was asked to indicate the degree to which s/he perceived the photographed children to be: (1) similar to him/herself; (2) preferred as a playmate; and (3) competent at a favorite school subject. The order of the items was fixed for all children. The child answered each question by placing the six photographs on the 60-centimeter cardboard,

with closer to the self indicating greater perceived similarity, greater play preference, and greater perceived competence. The direction of the scale was reversed, such that a rating of 0 indicated the greatest perceived similarity, play preference and perceived competence. For the item on perceived competence, the child also placed on the board a line drawing representing the self to indicate his/her own perceived competence at the chosen school subject.

Children were asked about preference to assess race and age differences in preference for the two racial groups. Perceived competence of the photographed children and of the self was measured in order to assess race and age differences in perceived status of groups of Black and White children in relation to the self. In order to learn about the dimensions along which children were responding to the perceived similarity item, in addition to placing the stimuli, subjects were asked to provide reasons for their judgements of similarity and dissimilarity for one exemplar of each race.

For each subject, ratings for the three photographed children of each race were averaged to give a mean score for Whites and a mean score for Blacks for perceived similarity, preference, and perceived competence. These six mean scores were then used in analyses. This method of assessment has been recommended by Aboud (1988), as it permits the

independent assessment of perceptions of same-race and other-race children. Administration instructions and response forms for the measure are given in Appendix B.

Interpersonal Problem Solving Measure. A translated version of the measure of Interpersonal Problem Solving (Marsh, 1982) was used to measure the level of maturity of interpersonal problem solving, prior to and following the presentation of a conflictual answer by a child of the same or other race. This developmental measure consists of two dilemmas that require children to analyze and solve interpersonal problems, each of which involves perspective-taking ability in a social context. For a sample of children in grades kindergarten to 6, Marsh (1982) reported developmental changes in children's ability to define the problem, to generate alternative solutions and consequences of the solutions, and to include the perspectives of a greater number of people in the solutions. Older children were more likely to define the problems conceptually, with reference to behavioral and psychological aspects of the problem. Marsh (1982) reported that interrater reliability between scores given by two judges for 30% of the sample ranged from .89 to 1.00 for the various indices of interpersonal problem solving.

The first dilemma of the Interpersonal Problem-Solving measure involves deciding how to resolve a situation in which there are too few circus tickets available for the

number of children involved. Each of the children deserves special consideration: one has his/her birthday and has been promised a special outing; one is poor and doesn't have the opportunity to go on special outings, and one is new in the neighborhood and wants to meet more children.

The second dilemma concerns the assignment of responsibility for a broken lamp that results from a frisbee that was thrown around indoors during the mother's absence. Three children are involved: an older child who is babysitting a younger sibling, the younger sibling who invites a friend to the home to play, and the friend who throws the frisbee. In solving the problem, the children may consider the relative responsibility of each of the three children.

The dilemmas were read aloud to each child and illustrated with coloured, race-appropriate pictures. There were separate forms of the stories for males and females. Following the presentation of each dilemma, children were asked three questions: (a) What would you do if you had to solve this problem? (b) What might happen if .... (each solution given in response to the preceding question)? and (c) What do you think would be the best way to solve this problem and why? The stories, questions, and examples of accompanying illustrations are given in Appendix B.

Responses to each of these questions were scored according to Marsh's (1982) criteria, to assess the

following abilities: (a) alternative thinking: total number of separate, relevant solutions proposed (e.g., mother cleans up mess, no one goes to circus); (b) consequential thinking: total number of separate, relevant consequences given for each solution (e.g., mother would be angry, it wouldn't be fair to the others); and (c) solution adequacy: the degree to which the chosen solution reflects the perspectives, needs, and responsibilities of the different individuals in the problem situation. For example, solutions that dealt adequately with none of the children's perspectives received a score of zero (e.g., let the mother clean up the mess, no one goes to the circus). Responses were given higher scores (1 to 4) to reflect relatively more adequate solutions. For example, for the frisbee problem, a solution which attributes responsibility to only one child received a lower score (score = 1), whereas a solution in which all children share responsibility received a higher score (score = 4). For the circus problem, having the main character take only one other child received a lower score (score = 1) than selling the tickets and using the money in a way that benefits all four children (score = 4). The scoring criteria used by Marsh are given in Appendix B.

Responses were initially scored using Marsh's scoring, and subsequently used as a basis for the conflict manipulation procedure described below. Following the completion of Experiment 1, pretest and posttest responses

were reviewed due to three problems experienced with the scoring system: (1) The four-level coding system for solution adequacy did not differentiate sufficiently between answers, according to subtle differences judged by the author. For example, according to Marsh (1982) on the Frisbee dilemma, solutions which involved one or more children and the parent(s) should be coded as equivalent to solutions which involved only the children. Given the parents' absence during the incident, the author considered that an autonomous regulation of the problem by the children was a more mature solution than deferring responsibility to the parent, and that this difference should be reflected in the coding scheme; (2) For the solution to the Circus dilemma that "No one goes", differentiation between a level 0 and a level 3 on the basis of the mere presence of an explanation accompanying the answer did not prove useful, since all children provided an explanation upon request; (3) Marsh's coding system included "minus" scores for "spoiled answers", which led to equivalence between higher level, impractical answers and lower level answers. For example, the solution that the main character should stay home and all the friends go was scored as a spoiled answer due to its impracticality. It thus received an equivalent score to the solution that one child is left out and not compensated. The author considered that the code must differentiate between the number of perspectives considered in the

solution, independent of its practicality.

Given the above problems, the author revised Marsh's coding system to an 8-level coding scheme which retained the original principle that higher scores reflect greater solution adequacy, but which remediated the problems described above. This coding scheme is also given in Appendix B. Pretest and posttest responses which were recoded using the revised coding scheme form the data base that was analyzed in the present report. To check the reliability of the revised code, 20% of the protocols were coded by a second coder, and percent agreement was calculated. Interrater reliability was calculated to be 87.5% overall (86.4% for pretests and 88.6% for posttests). Cohen's (1960) kappa, a measure of interrater reliability which accounts for chance agreement, was calculated to be .85, for pretest and posttest scores taken together. Disagreements between the two raters were resolved by discussion and consensus.

Alternative and consequential thinking were not analyzed due to an observed tester difference which was confounded with race and which appeared to affect the length of the interviews and the number of alternative solutions provided by the subjects. Specifically, all subjects of a given race were tested by the same tester, with Black children tested by a Black tester, and White children tested a White tester, as advised by Aboud (personal

communication), in order to avoid an interaction effect between the race of tester and the race of subject on children's perceptions (Katz et al., 1975). Due to a more relaxed interaction style with the children, one tester elicited a greater number of alternative solutions and consequences than the other tester. It was considered unfruitful to analyze data that were confounded with a tester effect. The potential confounding effect of tester style on the best solution chosen by the subjects was taken into consideration when analyzing race differences in solution adequacy.

Procedure

Subjects were tested individually during two 30-minute sessions, spaced approximately one week apart ($M$ = 5.67 days, $s.d.$ = 1.52 days). Two female testers, one Black (Haitian) and one White (French Canadian), both undergraduate students in psychology, tested children of the same race as themselves. It would have been desirable to have more than one tester for each race, but this was not possible.

During the first session, the tester administered the Race Perception Task and the Interpersonal Problem-Solving measure (pretest). The child's answers on the Interpersonal Problem-Solving measure were then scored by the author for solution adequacy, according to Marsh's original scoring criteria as described above. All children were administered

the tests in the same order.

During the second testing session, a cognitive conflict was induced for one dilemma from the Interpersonal Problem-Solving measure, by presenting an alternative answer to that given by the subject on the pretest. Since in pilot work the two dilemmas appeared to differ in difficulty, with the Frisbee dilemma (attribution of responsibility) appearing more difficult than the Circus dilemma (distribution of assets), it was decided that for this study, only the Circus dilemma would be used during the conflict induction. To induce the sociocognitive conflict, the examiner briefly summarized the Circus story and reminded the subject of his/her own answer to the dilemma. She then showed the subject a photograph of an unfamiliar child of the same sex, same age, and same or other race as the subject, and told the subject the photographed child's fictitious answer to the circus dilemma. The rationale for conflict induction by the experimenter rather than by a peer was based on previous research (Lefebvre and Pinard, 1974) showing that sociocognitive conflict initiated by an experimenter is effective in inducing cognitive change, and on research by Nelson and Aboud (1985) that variables in a peer discussion did not have a significant effect on the degree of change. The efficacy of this procedure was supported in pilot work prior to the present study.

The experimental manipulation consisted of presenting

the conflicting answer as having been given by either a same-race or an other-race child: for half of the children in each race-sex group, the photographed child was of the same race, and for the other half, of the other race. A no-treatment control group was not included in the design because the focus of the study was on the differential effect of race of peer on social-cognitive growth following sociocognitive conflict, and not on the effect of the sociocognitive conflict per se. The fictitious answer attributed to the photographed child was one level above the child's own pretest answer, according to Marsh's original coding scheme. This procedure was based on the rationale that answers at one level of maturity above the child's present level of reasoning are optimal for stimulating change (Mugny and Doise, 1978; Turiel, 1974). A list of the fictitious answers given for each level is given in Appendix B. According to the revised coding scheme by the present author, the fictitious answer was approximately two levels (mean = 1.91, s.d. = 1.07) above the child's own pretest answer. This difference between the levels of the child's solution and the alternative solution is consistent with the two-level difference used by Nelson and Aboud (1985). Walker (1982) also found that exposure to two-stages-above reasoning was as effective as exposure to one-stage-above reasoning in promoting growth in moral reasoning.

Immediately following the presentation of an

alternative answer to induce a sociocognitive conflict, a posttest on the two dilemmas was conducted. The child's posttest response to the Circus dilemma was utilized to measure response change following the conflict, and his/her posttest response to the Frisbee dilemma was used to assess whether hearing a more mature level of reasoning about one type of dilemma also stimulated change in a child's reasoning about a different type of dilemma.

Due to revision of the scoring system from Marsh's original system and subsequent recoding of the pretest and posttest scores, 6 of the original 96 subjects were coded as receiving a lower level of alternative answer than their rescored pretest level. These subjects were deleted from the analyses, resulting in the final sample of 90 subjects for which the cell sizes are given in Table 1.

To obtain a rough measure of whether change demonstrated at posttest would be maintained over time, followup letters were sent home with participating children two weeks following the completion of posttesting of all subjects. Parents were requested to read the Circus dilemma to their child, note the child's solution on the form supplied, and return the form by mail. Responses were received for 60 of the 90 subjects. On the average, response forms had been filled out two months following the posttest of each child (mean number of days = 59.29, s.d. = 23.62).

## Results

The results are presented in two parts based on the goals of the study. The first section presents the analyses of the perceptions of White and Black children toward same-race and other-race peers, as assessed by the Race Perception Task. The second section presents analyses of the effect of race of peer on social-cognitive growth following a sociocognitive conflict, as assessed by pretest and posttest scores on the Interpersonal Problem-Solving Measure. Results of preliminary analyses related to the psychometric properties of the measures and initial preparation of the data set (i.e., analyses of outliers, assumptions of normality and homogeneity of variance, and school differences) are reported in Appendix C. Analysis of variance summary tables are given in Appendix D. Correlations between items within each measure are given in Appendix F.

### Perceptions of Same-Race and Other-Race Children

To analyze group differences in perceptions of same-race and other-race children, three separate repeated measures analyses of variance were conducted for sets of ratings of perceived similarity (Mean score for Whites, Mean score for Blacks), preference (Mean scores for Whites, Mean score for Blacks), and perceived competence (Mean scores for Whites, Mean score for Blacks, Raw score for Self). Grade, sex, and race of subject were entered as between-group

factors and race of target (photographed child) was entered as the within-subject factor.

Perceived similarity. Analyses of variance indicated a highly significant two-way interaction effect between race of subject and race of target, $F$ (1,82) = 326.51, $p$ < .0001. Scheffé post hoc comparisons indicated that, as hypothesized, White and Black subjects perceived same-race children as more similar to themselves than other-race children (see Table 2). A comparison of subjects' perceptions of other-race children indicated that Black subjects perceived White target children as more similar to themselves than White subjects perceived Black target children to be similar (14.45 versus 16.77, respectively). In addition, a comparison of subjects' perceptions of same-race children indicated that Black subjects perceived Black target children as more similar to themselves than White subjects perceived White target children to be similar (7.96 versus 9.78, respectively). This interaction was reflected in a significant main effect of race, $F$ (1,82) = 12.37, $p$ = .001, which indicated that Black subjects perceived all children to be more similar to themselves than did White subjects.

There was also a significant three-way interaction between grade, sex, and race of target, $F$ (1,82) = 4.45, $p$ < .05, which qualified a main effect of grade, $F$ (1,82) = 11.28, $p$ = .001. This interaction was followed up by

Table 2

Perceived Similarity Ratings of Target Children by White and Black Subjects

| | Race of Target | | |
|---|---|---|---|
| Race of Subject (n) | White | Black | Total |
| | M (s.d.) | M (s.d.) | M (s.d.) |
| Total (90) | 12.07 (4.32) | 12.47 (5.52) | 12.27 (3.14) |
| White (46) | 9.78 (3.29) | 16.77 (2.72) | 13.28 (2.53) |
| Black (44) | 14.45 (3.98) | 7.96 (3.82) | 11.21 (3.39) |

separate analyses of variance for boys and for girls.

For boys, in addition to the significant interaction effect between race of subject and race of target, $F$ (1,38) = 131.86, $p < .0001$, there was a significant interaction effect between grade and race of target, $F$ (1,38) = 4.14, $p < .05$, which qualified a main effect of grade, $F$ (1,38) = 16.14, $p < .001$. Tukey HSD pairwise comparisons, corrected for unequal cell sizes (Kirk, 1968), indicated that the interaction between grade and race of target was attributable to a significant grade difference with respect to White target children but not with respect to Black target children. Averaging across race of subject, boys in grade 1-2 perceived White target children to be more similar to themselves than did boys in grade 3-4 (see Table 3). The grade difference in boys' perceptions of Black target children was nonsignificant. This interaction qualified the highly significant grade effect when averaging across White and Black target children, which showed that younger boys perceived target children to be more similar to themselves than did older boys (means of 10.83 versus 13.91 for boys in grade 1-2 and grade 3-4, respectively).

For girls, in addition to the significant interaction effect between race of subject and race of target, $F$ (1,44) = 199.48, $p < .0001$, there was a significant main effect of race of subject, $F$ (1,44) = 9.88, $p < .01$. Black girls perceived both White and Black target children as more

Table 3

Perceived Similarity Ratings of Target Children by Boys and Girls in Grades 1-2 and 3-4

| Sex (n) | Race of Target | | |
|---|---|---|---|
| | White | Black | Total |
| | M (s.d.) | M (s.d.) | M (s.d.) |
| Boys (42) | 12.52 (4.46) | 12.51 (5.23) | 12.52 (2.94) |
| Grade 1-2 (19) | 10.19 (4.14) | 11.47 (5.54) | 10.83 (2.72) |
| Grade 3-4 (23) | 14.45 (3.81) | 13.36 (4.92) | 13.91 (2.37) |
| Girls (48) | 11.67 (4.20) | 12.43 (5.81) | 12.05 (3.32) |
| Grade 1-2 (24) | 11.39 (4.15) | 11.72 (5.67) | 11.56 (2.77) |
| Grade 3-4 (24) | 11.94 (4.32) | 13.14 (5.98) | 12.54 (3.79) |

similar to themselves than did White girls (means of 10.67 versus 13.42 for Black and White girls, respectively). The main effect of grade for girls was nonsignificant, $F$ (1,44) = 1.27. n.s., as was the interaction effect between grade and race of target, $F$ (1,44) = .79, n.s..

In order to learn about the dimensions along which children were responding to the perceived similarity item, children were asked about the reasons for their judgements of similarity or dissimilarity of one exemplar of a same-race and an other-race child. A qualitative analysis of the responses indicated that 97% (87/90) of the children gave reasons that were classifiable along the dimension of physical characteristics (e.g., facial features, hair colour or type, skin colour, body size, clothing). Seventy-two percent (65/90) specified skin colour as a dimension of similarity or difference. In the entire sample, only three children, all from grade 3-4, gave reasons that were classifiable along a more internal dimension (e.g., similar interests, same age). The children's responses indicate that they interpreted the question of perceived similarity along the dimension of physical characteristics, and that three-fourths of them indicated that skin colour was one dimension of similarity/difference.

Preference. Analyses of variance indicated a significant interaction effect between race of subject and race of target, $F$ (1,82) = 18.38, $p < .001$. Tukey HSD

pairwise comparisons, corrected for unequal cell sizes (Kirk, 1968), indicated a same-race preference for White subjects but not for Black subjects (see Table 4). Moreover, preference ratings by White subjects of Black target children were significantly weaker than ratings by Blacks of Black target children, and than ratings by Whites and Blacks of White target children. In other words, there was no difference between Whites and Blacks in their preference ratings of same-race peers, although Blacks showed stronger other-race preference ratings than Whites. The stronger other-race preference in Blacks was reflected in a significant main effect of race of subject, $F$ (1,82) = 4.52, $p < .05$, with Black subjects giving higher preference ratings than White subjects of all target children.

There was also a significant interaction effect between sex of subject and race of target, $F$ (1,82) = 8.29, $p < .01$. Tukey HSD pairwise comparisons, corrected for unequal cell sizes (Kirk, 1968), indicated that girls' preference for playing with Whites was significantly stronger than girls' preference for playing with Blacks, and than boys' preference for playing with Whites (see Table 5). In comparison, boys showed no difference in play preference for White versus Black target children.

Perceived competence. Three targets were included in the analysis of perceptions of competence: (1) Mean rating for White children, (2) Mean rating for Black children, and

Table 4

Preference Ratings for Target Children by White and Black Subjects

| Race of Subject (n) | Race of Target | | |
|---|---|---|---|
| | White | Black | Total |
| | M (s.d.) | M (s.d.) | M (s.d.) |
| Total (90) | 6.91 (3.60) | 7.74 (4.07) | 7.22 (2.91) |
| White (46) | 6.57 (3.00) | 9.33 (4.23) | 7.95 (2.70) |
| Black (44) | 7.26 (4.15) | 6.07 (3.15) | 6.66 (3.01) |

Table 5

Preference Ratings for Target Children by Boys and Girls

| Sex (n) | Race of Target | | |
|---|---|---|---|
| | White | Black | Total |
| | M (s.d.) | M (s.d.) | M (s.d.) |
| Total (90) | 6.91 (3.60) | 7.74 (4.07) | 7.32 (2.91) |
| Boys (42) | 7.99 (3.86) | 7.34 (3.97) | 7.67 (2.93) |
| Girls (48) | 5.96 (3.10) | 8.08 (4.16) | 7.02 (2.89) |

(3) Rating for Self. Analyses of variance were conducted using the Greenhouse-Geisser correction due to violation of the compound symmetry assumption (see Appendix C). There was a significant interaction effect between race of subject and target, $F$ (1.76,144.16) = 4.01, $p < .05$, which qualified a highly significant main effect for target, $F$ (1.76,144.16) = 37.06, $p < .0001$. Scheffé post hoc comparisons conducted on the means given in Table 6 indicated that averaging across race of subject, competence ratings of Self were significantly higher than competence ratings of White and of Black children. The race of subject and target interaction was attributable to the result that competence ratings by Blacks of Black target children were significantly higher than competence ratings by Whites of Black target children, and than competence ratings by Whites and by Blacks of White target children.

There was also a significant interaction between sex and race of subject, $F$ (1,82) = 6.12, $p < .05$, which qualified a main effect of race of subject, $F$ (1,82) = 3.96, $p = .05$. Inspection of the means given in Table 7 suggests that Black girls rated all groups of target children as more competent than did other groups of subjects. A Scheffé multiple comparison between the mean for Black girls and the means of the three other groups taken together was nonsignificant, however, probably due to the conservative Scheffé statistic. Tukey HSD pairwise comparisons,

Table 6

Competence Ratings for Target Children by White and Black Subjects)

| Race of Subject (n) | Target | | |
|---|---|---|---|
| | Self | White | Black |
| | M (s.d.) | M (s.d.) | M (s.d.) |
| Total (90) | 4.26 (4.14) | 8.39 (3.23) | 7.89 (3.78) |
| White (46) | 4.22 (4.53) | 8.62 (3.12) | 9.21 (3.69) |
| Black (44) | 4.30 (3.75) | 8.15 (3.37) | 6.53 (3.40) |

Table 7

Competence Ratings for Self, White and Black Children by White and Black Boys and Girls

| Race of Subject | Target | | | |
|---|---|---|---|---|
| | Self | White | Black | Total |
| | M (s.d.) | M (s.d.) | M (s.d.) | M (s.d.) |
| Total (90) | 4.3 (4.1) | 8.4 (3.2) | 7.9 (3.8) | 6.9 (2.3) |
| White (46) | 4.2 (4.5) | 8.6 (3.1) | 9.2 (3.7) | 7.4 (2.2) |
| Boys (22) | 3.7 (4.8) | 9.4 (3.3) | 8.1 (4.1) | 7.1 (2.1) |
| Girls (24) | 4.7 (4.3) | 7.9 (2.9) | 10.2 (3.1) | 7.6 (2.3) |
| Black (44) | 4.3 (3.8) | 8.2 (3.4) | 6.5 (3.4) | 6.3 (2.4) |
| Boys (20) | 5.2 (3.0) | 9.3 (3.7) | 7.6 (4.0) | 7.4 (2.3) |
| Girls (24) | 3.5 (4.2) | 7.2 (2.8) | 5.6 (2.6) | 5.5 (2.1) |

corrected for unequal cell sizes (Kirk, 1968), revealed a significant difference between competence ratings by Black girls versus White girls. All other pairwise comparisons were nonsignificant. The main effect for grade was nonsignificant, $F$ (1,82) = .49, n.s., as were all interactions by grade.

Relationships between ratings of perceived similarity, preference, and perceived competence. Correlational analyses were conducted on similarity, preference, and competence scores from the Race Perception Task in order to examine relationships between measures for White and Black children. Following multiple regression analyses which indicated that the pattern of correlations differed for younger and older children (see Appendix E), correlations are presented separately for children in grade 1-2 and grade 3-4 (see Tables 8 and 9).

For the two age-groups, similar patterns of correlations were found between measures of preference and perceived competence. At grade 1-2, correlations were $r$ = .43, $p < .05$, and $r$ = .48, $p < .05$, for White and Black target children, respectively. At grade 3-4, correlations were $r$ = .50, $p < .05$, and $r$ = .66, $p < .05$, for White and Black target children, respectively. The differences between the correlations for White and Black target children at the two age levels were not significant.

Different patterns for the two age-groups were found

Table 8

Intercorrelations between Items in Race Perception Task for Subjects in Grades 1-2 (n = 43)

| Variable | Simwhm | Simblm | Prfwhm | Prfblm | Comwhm | Comblm | Comself |
|---|---|---|---|---|---|---|---|
| Simwhm | -- | -.39 | -.14 | -.29 | -.19 | -.30 | .03 |
| Simblm | | -- | .05 | .33 | -.03 | .43* | -.11 |
| Prfwhm | | | -- | .29 | .43* | .22 | .22 |
| Prfblm | | | | -- | .19 | .48* | -.11 |
| Comwhm | | | | | -- | -.40 | .05 |
| Comblm | | | | | | -- | -.06 |
| Comself | | | | | | | -- |

Variable Names

Simwhm - Mean similarity rating for White targets
Simblm - Mean similarity rating for Black targets
Prfwhm - Mean preference rating for White targets
Prfblm - Mean preference rating for Black targets
Comwhm - Mean competence rating for White targets
Comblm - Mean competence rating for Black targets
Comself - Competence rating for Self

Bonferroni Family-Wise Alpha

* $p < .05$

Table 9

Intercorrelations between Items in Race Perception Task for Subjects in Grades 3-4 (n = 47)

| Variable | Simwhm | Simblm | Prfwhm | Prfblm | Comwhm | Comblm | Comself |
|---|---|---|---|---|---|---|---|
| Simwhm | -- | -.13 | .31 | -.02 | .32 | .08 | .04 |
| Simblm | | -- | -.05 | .53* | .14 | .34 | -.03 |
| Prfwhm | | | -- | .05 | .50* | .20 | -.02 |
| Prfblm | | | | -- | .08 | .66* | -.20 |
| Comwhm | | | | | -- | .15 | -.01 |
| Comblm | | | | | | -- | .07 |
| Comself | | | | | | | -- |

Variable Names

Simwhm - Mean similarity rating for White targets
Simblm - Mean similarity rating for Black targets
Prfwhm - Mean preference rating for White targets
Prfblm - Mean preference rating for Black targets
Comwhm - Mean competence rating for White targets
Comblm - Mean competence rating for Black targets
Comself - Competence rating for Self

Bonferroni Family-Wise Alpha

* $p < .05$

for correlations between measures of perceived similarity and perceived competence, and between measures of perceived similarity and preference. At grade 1-2, perceived similarity and perceived competence were significantly correlated for Black target children but not for White target children ($r$ = .43, $p$ < .05, versus $r$ = -.19, n.s., respectively). At grade 3-4, correlations were positive for both Black and White children, but did not reach significance following the Bonferonni correction for family-wise alpha ($r$ = .34, n.s., and $r$ = .32, n.s., for Black and White target children, respectively). The difference between the correlations at the two age levels, tested using Fisher's r to z transformation (Ferguson, 1976), was significant for White target children ($r$ = -.19 versus $r$ = .32, $p$ < .05), but not for Black target children ($r$ = .43 versus $r$ = .32, n.s.).

For similarity and preference, at grade 1-2, the correlation approached significance for Black target children ($r$ = .33, n.s.) but not for White target children ($r$ = -.14, n.s.). At grade 3-4, perceived similarity and preference were significantly correlated for Black target children ($r$ = .53, $p$ < .05). For White target children, this correlation was in the same direction but did not reach significance ($r$ = .31, n.s.). The difference between the correlations at the two age levels was significant for White target children ($r$ = -.14 versus $r$ = .31), but not for Black

target children ($r$ = .34 versus $r$ = .54, n.s.).

Summary. In summary, analyses of variance supported the hypothesis that children perceive same-race children as more similar to themselves than other-race children. This general pattern was accompanied by a developmental decrease in boys' perceptions of similarity to White children, and by a race and sex difference whereby Black girls perceived children of both races to be more similar to themselves than did White girls.

A same-race play preference was found in White children. In comparison, Black children showed no significant difference in play preference for same-race versus other-race peers, although the direction of their preference favoured same-race peers. A sex difference in preference was found whereby boys showed equal preference for playing with children of both races, whereas girls showed a stronger preference for playing with White children. In addition, girls' preference for Whites was stronger than that of boys. These results indicate a preference for Whites by girls but not by boys.

With respect to perceptions of competence, both White and Black subjects gave higher ratings of perceived competence to themselves than to children of both races. The competence ratings by Blacks of Black target children were higher than their ratings of White target children, and also higher than ratings by Whites of both White and Black

target children. Black girls rated all groups of target children as more competent than did White girls.

Correlational analyses on similarity, preference, and competence scores indicate, for both age-groups, that ratings of preference and perceived competence were positively correlated for both White and Black target children. At grade 1-2, ratings of perceived similarity and perceived competence were positively correlated for Black target children, although the correlation did not differ significantly from the corresponding nonsignificant correlation at grade 3-4. At grade 3-4, ratings of perceived similarity and preference were positively correlated for Black target children. Once again, however, this correlation did not differ from the corresponding nonsignificant correlation at grade 1-2.

The Influence of Racial Group of Peer on Social-Cognitive Growth following a Sociocognitive Conflict

The hypothesis that the peer's racial group would influence social-cognitive growth following a sociocognitive conflict was tested by analyzing group differences in pretest and posttest scores for the two dilemmas in the Interpersonal Problem-Solving Measure. Because interest was in children's growth on each story separately, separate analyses of variance were performed (Huberty and Morris, 1989). The correlations between scores for the Circus and the Frisbee story were nonsignificant, $r$ = .16, n.s., at

pretest, and $r$ = .20, n.s., at posttest.

In order to ensure that groups were equivalent across the experimental condition of race of peer (same, other) prior to the experimental manipulation, analyses of variance were performed on the pretest scores for the Circus and Frisbee dilemmas. Grade, sex, race of subject, and race of peer (same, other) were entered into the analyses as between-subject factors. For the Circus dilemma, there was a main effect for grade, $F$ (1,74) = 5.91, $p < .05$, indicating that subjects in grade 3-4 received higher scores than subjects in grade 1-2 (means of 5.53 versus 4.67, respectively). There were no other significant main effects or interactions. For the Frisbee dilemma, there were no significant main effects or interactions. These results indicate equivalence of pretest scores for the two experimental groups prior to the experimental manipulation.

Circus dilemma. The effect of race of peer on social-cognitive growth on the Circus dilemma following a sociocognitive conflict was examined via a repeated measures analysis of variance. Grade, sex, race of subject, and race of peer (same, other) were entered as between-subject factors, and time of testing (pretest, posttest) was entered as the within-subject factor. Results indicated a significant main effect of grade, $F$ (1,74) = 10.41, $p < .01$, which showed that subjects in grade 3-4 received higher scores than subjects in grade 1-2 (means of 6.01 and 5.11

respectively). There was also a main effect of time of testing, $F$ (1,74) = 19.39, $p < .001$, indicating that posttest scores were higher than pretest scores (means of 6.04 and 5.12 respectively). There were no main effects of race of subject, $F$ (1,74) = .36, n.s., race of peer, $F$ (1,74) = .19, n.s., or sex, $F$ (1,74) = .23, n.s.. The hypothesized interaction between race of peer and time of testing was nonsignificant, $F$ (1,74) = .08, n.s., as were all other interactions. Means and standard deviations for pretest and posttest scores for the Circus dilemma are given in Table 10.

Frisbee dilemma. In order to assess pre-post changes in scores for an unrelated story, a repeated measures analysis of variance was also conducted for the Frisbee dilemma. Grade, sex, race of subject, and race of peer were entered as between-subject factors, and time of testing (pretest, posttest) was entered as the within-subject factor. Results indicated a main effect for time of testing, $F$ (1,74) = 4.22, $p < .05$, which showed that posttest scores were higher than pretest scores (means of 4.57 and 4.28 respectively). The main effect of grade was nonsignificant, $F$ (1,74) = 2.79, n.s., although the means were in the expected direction. There were no significant effects of race of subject, $F$ (1,74) = .62, n.s., race of peer, $F$ (1,74) = 1,21, n.s., or sex, $F$ (1,74) =.74, n.s.. There were also no significant interactions. Means and

Table 10

Pretest and Posttest Scores for Circus Story

| Grade | n | Pre-test M (s.d.) | Post-test M (s.d.) |
|---|---|---|---|
| Total | 90 | 5.12 (1.70) | 6.04 (1.64) |
| Grade 1-2 | 43 | 4.67 (1.80) | 5.56 (1.76) |
| Grade 3-4 | 47 | 5.53 (1.52) | 6.49 (1.40) |

standard deviations for pretest and posttest scores for the Frisbee dilemma are given in Table 11.

Maintenance of growth at followup. Given that subjects progressed in their reasoning on the Circus dilemma from pretest to posttest, it was of interest to examine whether the gain in reasoning was maintained at followup. Since the followup data had been collected by the parents instead of by the research team, this analysis was considered as an interesting, albeit exploratory, endeavor. A repeated measures analysis of variance was conducted for the 60 subjects for whom the followup letter had been returned. Grade and race of peer (same, other) were entered as between-group factors and time of testing (pretest, posttest, followup) was entered as the within-subject factor. The sample was combined across sex and race of subject given the reduced sample size for this analysis and given the nonsignificant results of these factors on previous analyses.

Analyses of variance indicated a significant main effect of time of testing, $F$ (2,112) = 10.12, $p < .001$. Tukey HSD pairwise comparisons indicated that subjects received higher scores at posttest than at pretest, and at posttest than at followup (means of 5.05, 6.08, and 5.17, at pretest, posttest, and followup, respectively). These results indicate that gains achieved at posttest were not maintained at followup. There was also a significant

Table 11

Pre-test and Post-test Scores for Frisbee Story

| Group | n | Pre-test M (s.d.) | Post-test M (s.d.) |
|---|---|---|---|
| Total | 90 | 4.28 (1.34) | 4.57 (1.61) |
| Grade 1-2 | 43 | 4.14 (1.23) | 4.23 (1.39) |
| Grade 3-4 | 47 | 4.40 (1.44) | 4.87 (1.74) |

interaction between grade and race of peer, $F$ (1,56) = 6.97, $p < .05$, which qualified a main effect of grade, $F$ (1,56) = 4.66, $p < .05$. Tukey HSD pairwise comparisons on mean scores for pretest, posttest, and followup indicated that at grade 1-2, subjects in the other-race condition gave more mature solutions than subjects in the same-race condition (means of 5.33 versus 4.67, respectively). At grade 3-4, subjects in the same-race condition gave more mature solutions than subjects in the other-race condition (means of 6.16 versus 5.25, respectively). The interaction between grade, race of peer, and time of testing was nonsignificant, $F$ (2,112) = 1.30, n.s..

Summary. In summary, results failed to support the hypothesis that race of peer influenced social-cognitive growth following a sociocognitive conflict. On the Circus dilemma, main effects of grade and time of testing indicated that subjects in grade 3-4 scored higher than subjects in grade 1-2, and that all groups of subjects progressed in their reasoning from pretest to posttest, regardless of the race of peer who had provided the conflicting response. On the Frisbee dilemma, the effect of grade was nonsignificant although in the expected direction, and all groups of subjects also progressed in their reasoning from pretest to posttest on this story. Analyses of followup data on the Circus dilemma for a subset of the sample indicated that the gains shown at posttest did not maintain at followup. The

reliability of these data is questionable, however, given that they were based on parent interviews and reports of children's answers.

## Discussion

The goal of the present study was to examine the influence of the social dimension of racial group on social-cognitive growth following a sociocognitive conflict. This goal was achieved by assessing children's perceptions of same-race and other-race peers, and by experimentally manipulating the factor of racial group of peer in a paradigm eliciting a sociocognitive conflict. The results of this study show that in their perceptions, children differentiate same-race from other-race peers, but that racial group of peer does not influence social-cognitive growth following a sociocognitive conflict.

### Perceptions of Same-Race and Other-Race Peers

Developmental research on ethnic attitudes in children focuses on changes with age in the nature of ethnic attitudes and in the different cognitive and social factors that contribute to them (Aboud, 1988). Research to date has demonstrated that children differentiate between same-race and other-race peers along the dimension of preference, albeit with a different pattern of development for White than for Black children. In the present study, White children demonstrated a same-race preference which remained

constant with age. These results are consistent with previous research for White children which shows no age change in same-race preference after 7 years (e.g., Aboud, 1977; Epstein et al., 1976). In comparison to Whites, Black children in the present study showed a pattern of equal preference for Blacks and for Whites which did not change with age. This result is consistent with previous studies showing an absence of preference in Black minority children (e.g., Branch and Newcombe, 1980).

It is noteworthy that on the present task which independently assesses preference for Whites and for Blacks, White children did not reject Blacks in favour of same-race peers. Although White children showed a significant same-race preference, they placed photos of Black children in the neutral (middle) zone rather than the negative (most distant) zone of the scale. This pattern indicates that a preference for their own race did not entail a rejection of children of the other race. It is also noteworthy that although Black children did not prefer children of their own race over Whites, they were as positive as White children in their same-race preference ratings. This is a positive finding which suggests that although Canadian Black children are flexible in their choice of the racial group of their playmates, they have a positive attitude towards their own race.

The patterns of preference by White and Black children

were accompanied by an interaction effect between sex and race of target. This interaction showed that girls of both races preferred Whites, and that boys showed equal preference for Whites and Blacks. Given the age range of the sample, the result for boys is consistent with reports of a decline in same-race preference by White children after 7 years (e.g., Rice et al, 1974; Zinser et al., 1981), and with a positive attitude by Blacks towards their own race after the age of 7 years (e.g., Asher and Allen, 1969). The stronger preference for Whites by girls, but not by boys, may be interpreted in terms of greater adherence by girls to models of higher societal status, as has been suggested by Aboud and Skerry (1984).

With regard to perceived similarity, the results of the present study confirm that Black and White children perceive same-race children as more similar to themselves than other-race children. This finding was expected in the light of research demonstrating that White and Black children show same-race identification prior to the age of 5 years (Aboud, 1987; 1988). The significant interaction effect between sex, grade, and race of target children suggests, however, different developmental patterns of perceptions of similarity for girls and for boys. The greater perceived similarity of White target children by girls at both ages, but by boys in grade 1-2 only, suggests that girls of both races may identify more strongly with Whites, or may desire

to be like Whites, whereas identification with Whites appears to attenuate with age in boys. This finding may be interpreted in a similar way to the analogous finding for preference, in terms of a greater sensitivity in girls to characteristics that are socially valued and desirable.

With regard to the dimension of perceived competence, which has not been previously studied in the ethnic attitudes literature, results show that children of both races have equally high perceptions of self-competence. This finding is perhaps not surprising given the nature of the task; that is, children were asked to rate themselves on their favorite school subject. To the extent that this rating reflects self-esteem, the Black children of this sample show evidence of perceived self-competence equal to White children. Furthermore, to the extent that this rating reflects social status, Black subjects' ratings of Black target children were higher than their ratings of White target children, which supports a positive evaluation by Canadian Blacks of their own race. Given the age range of the sample, these results also support previous findings (e.g., Asher and Allen, 1969) of Black children's positive attitude towards their own race by 7 years old.

The correlations at grades 1-2 and 3-4 between ratings of preference and perceived competence for White and for Black target children indicate that in the absence of actual information upon which to base a rating of

competence, children related their competence judgements to their degree of liking for the photographed child. The pattern of correlations between perceived similarity and perceived competence of Black targets at grade 1-2, and between perceived similarity and preference of Black targets at grade 3-4, differs, however, from that predicted from a social-cognitive developmental theory of ethnic attitudes (Aboud, 1988). If affect is more salient for younger children, then one would expect the reverse pattern, that is, that preferences would influence similarity judgements for younger but not for older children, and that the difference between correlations at the two age levels would be significant.

A second prediction from social-cognitive developmental theory was partially supported by the present study. Developmental theory predicts that with age, children attend more to internal, individual attributes and less to external and group-related attributes. Thus, perceptions of between-group similarity are expected to increase with age, and perceptions of within-group similarity are expected to decrease with age. In this study, ratings of similarity of White and Black peers were made with reference to the self. Given this method of measurement, an interaction effect between age, race of subject, and race of target would be predicted. That is, with increasing age children would be expected to perceive same-race peers as less similar to

themselves and other-race peers as more similar to themselves. This prediction was supported only for White boys, who perceived White target children as less similar to themselves with increasing age. As discussed above, White girls and Black children of both sexes did not show age changes in perceived similarity.

The failure to obtain stronger support for the two above developmental predictions may be related to two factors. First, since all children in the younger age-group were older than 6 years of age, with a mean age of 7.5 years, they may not have polarized their ratings of same-race versus other-race children as strongly as preschool-aged children would have. Given the cognitive developmental changes which accompany the transition from pre-operational to concrete operational thinking around the age of 6-7 years, inclusion of a kindergarten group in the sample may have been necessary to observe the developmental changes predicted by the social-cognitive developmental theory of ethnic attitudes. In contrast, developmental changes after the age of 7 may be more gradual. Moreover, they may involve more internal attributes than those measured in the present Race Perception Task. The task used by Doyle et al. (1988) in which subjects attribute positive and negative qualities to children of different ethnicities may be more relevant to age changes in ethnic attitudes in middle childhood.

A second factor which may have influenced the developmental patterns in racial attitudes found in this study is the social environment. As mentioned above, girls may be more sensitive to models of higher social status (Aboud and Skerry, 1984). Given the social status differences which are associated with race in North America, girls may continue to attend to race-related cues of similarity and differences among individuals as they get older. This proposal is supported by the finding of the present study that girls' perception of similarity to Whites did not decrease with age, and that girls showed a preference for playing with White target children. Whereas previous research has suggested that social factors mediate cognitive developmental processes in Black children (Katz et al., 1975), the results of this study suggest that the attitudes of White girls are also affected. From this perspective, it appears that both cognitive developmental and social factors are necessary to explain the development of racial attitudes in children.

Racial Group as a Social Determinant of Social-Cognitive Growth

The present study hypothesized that perceived similarity in racial group would facilitate social-cognitive growth following a sociocognitive conflict, due to regulation of the conflict on a cognitive rather than a social level. The results of the Race Perception Task

demonstrate that children perceive same-race peers as more similar to themselves than other-race peers, and thus support the underlying assumption of the experiment. The experimental hypothesis addresses the question of whether these differential perceptions mediate the outcome of sociocognitive conflict.

The experiment failed to support the hypothesized effect of perceived similarity along the social dimension of race of peer, on social-cognitive growth in the context of sociocognitive conflict. Results were that children gave more mature solutions to a social perspective-taking dilemma at posttest than at pretest, regardless of the race of peer from whom they had received a conflicting, alternative answer. Moreover, they also matured from pretest to posttest on the Frisbee dilemma, for which no sociocognitive conflict had been induced.

At a first glance, these results would appear to support the general Piagetian hypothesis that sociocognitive conflict engenders cognitive growth, though not that the social factor of race influences the outcome. If this conclusion were accepted as valid, results would be consistent with studies by Doise et al. (e.g., 1975) which have shown the superiority of collective versus individual problem-solving on Piagetian tasks of conservation and spatial perspective-taking. Based on the failure of the subset of children to maintain gains at followup, however,

the extent to which the more mature level of reasoning was internalized or consolidated is questionable. Moreover, children also evidenced growth on the Frisbee dilemma, for which no sociocognitive conflict been induced. From this perspective, the present study provides insufficient evidence to conclude that the sociocognitive conflict was the source of stimulation of social-cognitive growth.

The procedure used to induce the sociocognitive conflict may have some bearing on the results of the study. In this study, the conflict was induced by having an adult experimenter tell the subject a more mature alternative answer to the dilemma, which had supposedly been given by a same-race or an other-race child presented in a photograph. This procedure raises the following question: Was the sociocognitive conflict used in this study sufficiently intense to produce a conflict? That is, would progress have been maintained, and/or would race of peer have had an effect, if two children of the same or different races had confronted each other, rather than only hearing the other's answer? Or alternatively, was the sociocognitive conflict used sufficiently socially intense, but confounded with the influence of the adult experimenter, such that children regulated the sociocognitive conflict in the relational domain? This may have occurred either by the children conforming to the answer given by the adult experimenter, a high status person, or by they assuming that

they were being corrected and should respond by giving the answer that the adult experimenter thought best.

Studies on the regulation of sociocognitive conflict in child-adult pairs demonstrate the strong conforming tendency of children to adult partners (Mugny et al., 1984). These studies suggest that a social regulation by conformity may have operated in this experimental paradigm. Moreover, the children's conformity to the answer provided by the adult (in the place of the photographed same- or other-race peer) would explain their failure to maintain their progress at followup. If children conformed, thus resolving the sociocognitive conflict in the relational domain, then the social psychological theory would predict that they would fail to restructure their cognitive processes at a higher level of reasoning. Children would, therefore, be expected to fail to maintain their progress. On the other hand, the correlation of $\underline{r} = .37$ between the level of alternative answer provided by the experimenter and the level of posttest answer given by the children suggests that either asking the child to solve the dilemma twice, or offering the alternative answer, was effective in promoting cognitive growth. A no-conflict control group would be necessary to distinguish between these alternatives.

In summary, given the results of the Race Perception Task, the results of this study fail to support the hypothesis that children use social differentiation along

the dimension of racial group as a regulating mechanism to resolve a sociocognitive conflict. Alternative answers associated with both same-race and other-race peers served equally well as anchors for new solutions to interpersonal problems. This conclusion is of course limited to children of the age range included in the sample, since social-cognitive developmental theory would predict a greater polarization of attitudes, and perhaps a stronger effect of racial group on interactions, in younger children. It is also limited to the operationalization of sociocognitive conflict and of social-cognitive growth that was used in the present project. The failure of the subset of children to maintain their progress also raises the important issue of the procedure used to induce a sociocognitive conflict in children. It appears that an adult presenting an answer attributed to a peer may not be perceived by the subject in the same way as hearing an alternative answer directly from a peer. Given the potentially confounding effect of the adult experimenter, it would be advisable to have children present their opinions to each other, to ensure that the sociocognitive conflict included a strong social component with a child rather than an adult, to avoid conformity as a relational regulation of the sociocognitive conflict, and to ensure that the sociocognitive conflict is sufficiently socially intense.

## Experiment 2

### Children's Perceptions of their Friends and Nonfriends and the Influence of Friendship on Social-Cognitive Growth

The second experiment examined the influence of friendship on social-cognitive growth following a sociocognitive conflict. This social dimension was chosen for study because of recent interest in friendship as a significant peer relationship, of which one of the hypothesized benefits is the stimulation of social and cognitive growth (Berndt, 1981c, Nelson and Aboud, 1985; Youniss, 1983). Children have been shown to differentiate their friends from nonfriend peers on the basis of numerous variables including greater perceived and actual similarity (e.g., Duck, 1975; Kandel 1978b, Singleton and Asher, 1979), more liking (Bigelow and LaGaipa, 1975), more mutual responsiveness and positive affect (Foot, Chapman, and Smith, 1977; Newcomb, Brady, and Hartup, 1979), and more honesty and criticism of each other's attitudes (Nelson and Aboud, 1985). The present study hypothesized that, given the perceptions that children have of their friends versus other peers, friendship would influence the extent to which children mature in their social perspective-taking ability following an interaction involving a sociocognitive conflict with a peer. In the following sections, research to date on friendship is reviewed, and the rationale for studying the dimension of friendship in the context of social-cognitive

growth following sociocognitive conflict is presented.

Theory and Research on Friendship

The theoretical significance of friendship was originally discussed by Sullivan (1953), who attributed a specific role to friendship in the development of social cognition and altruism. He hypothesized that during preadolescence (8 to 11 years), children develop a special interest in a same-sex peer who becomes their "chum". The friends' mutual love and respect for each other engenders intimacy and collaboration, through which recognition of similar interests and characteristics permits the validation of each child's personal worth. Furthermore, through the intimacy and honesty of friends, the preadolescent learns to see him/herself through the friend's eyes, a process which contributes to the development of social and affective perspective-taking skills. Sullivan (1953) also proposed that the intimate exchange between same-sex friends engenders equal status, in that the friend "becomes of practically equal importance in all fields of value" (p. 245). According to Sullivan, friendship influences social development through the generalization of the social-cognitive and altruistic concepts learned with the friend to social encounters with other persons.

The concept of collaboration as defined by Sullivan (1953) is similar to the process of cognitive conflict as defined by Piaget (1932) and described previously. Although

on the one hand Sullivan describes collaboration as "clearly formulated adjustments of one's behavior to the expressed needs of the other person ..." (p. 246), he also states that the intimate discussion by preadolescent friends is "significant in correcting autistic, fantastic ideas about oneself or others." (p. 248). This function could not occur without comparison and discussion, or, in Piagetian terms, conflict. With their respective foci on conflict and collaboration, Piaget and Sullivan propose that social interaction with peers or friends promotes understanding of the physical world and of the self.

Based on Sullivan's hypothesis that friendship is a distinctive peer relationship, the goal of most research to date has been to differentiate friendship from other peer relationships. Studies of children's conceptions of friendship have shown that by the age of 9 years, children reliably differentiate between friends and other peers, with reciprocity and equality being important defining features of friendship (Mannarino, 1980; Smollar and Youniss, 1982). Equal status, characterized by mutuality and sharing, has been shown to underlie children's friendship conceptions at all ages (Berndt, 1981b; Bigelow and LaGaipa, 1975), though the focus of the perceived equality seems to shift with age from an external activity-oriented dimension to an internal personality dimension (Smollar and Youniss, 1982). Friendship has been distinguished from acquaintance and

parent-child relationships in terms of the voluntary, positive, affective bond and the obligations which dictate appropriate behavior for friends (Furman, 1982). Friendship has also been shown to be distinct from the concept of popularity, in that it reflects a specific relation between two people, rather than the general degree of acceptance by the peer group (Masters and Furman, 1981).

Research on age differences in children's conceptions of friendship suggests that around the age of 8 or 9 years, children acquire a concept of friendship in which relations between persons are based on features such as equality and similarity, and by which friends are well differentiated from acquaintances. In contrast, younger children define friendship in terms of interactions based on play, in which friends participate in enjoyable activities and are less differentiated from other familiar peers (Furman and Bierman, 1984; Smollar and Youniss, 1982; Sullivan, 1953). Although interactions with familiar peers in early childhood are clearly important to social and cognitive development (Doyle, Connolly, and Rivest, 1980), young children's less well differentiated concept of friendship suggests that friends may not provide experiences that are different than those provided by familiar peers in general. Consistent with a looser definition of friendship than for older children, friendships of children younger than 9 years are reported to be less stable than those of children from

fourth grade up to adolescence, which remain stable for periods of at least several months (Berndt, 1981b; Berndt and Hoyle, 1985; Bukowski and Newcomb, 1984; Busk, Ford, and Schulman, 1973; Epstein, 1983b; Hallinan, 1978-1979; Tuma and Hallinan, 1979).

Friends may be distinguished from other peers on the basis of numerous characteristics, one of the most important of which is perceived and actual similarity. Throughout childhood and adolescence, friends have been found to be similar in age, sex, and race (e.g., Kandel, 1978b; Shantz, Shantz, and Templin, 1985; Singleton and Asher, 1979; Tuma and Hallinan, 1979), although children demonstrate greater similarity in sex than race in their friendship preferences (Singleton and Asher, 1977; Taylor and Singleton, 1983). Children and early adolescents are also similar to their friends on a variety of attributes and behaviors, such as personality constructs (Duck, 1975; Duck and Spencer, 1972), self-concept (Clark and Drewry, 1985) school attitudes, achievement, and educational aspirations (Ball, 1981; Epstein, 1983b; Erwin, 1985; Kandel, 1978a; Tesser, Campbell, and Smith, 1984), and orientation toward aspects of teen culture such as music, clothes, leisure-time activities, and the use of alcohol and drugs (Ball, 1981; Kandel, 1978b). These similarities are perhaps not surprising in that children and adolescents who have similar interests, for example working on a homework assignment,

playing basketball, or attending parties, are more likely to meet each other and to have the opportunity to select each other as friends. As described by Duck, Miell, and Gaebler (1980), moreover, and consistent with the view that people are attracted to those they perceive as similar (Berscheid and Walster, 1978), partners who discover a high degree of concordance between each other may be mutually attracted and more likely to progress from an initial acquaintanceship to a more intimate friendship. Similarity between friends in attitudes towards school and academic achievement has also been shown to develop during the course of a friendship (Epstein, 1983a).

Children also differentiate their friends from their nonfriends along the affective dimension of mutual liking and intimacy. Not surprisingly, friends have been shown to like each other more than nonfriends (Bigelow and LaGaipa, 1975). Moreover, from the age of 9 or 10 years and on through adolescence, friendships in children of both sexes are characterized by an increasing degree of intimate disclosure and knowledge (Berndt, 1981c; Bigelow, 1977; Diaz and Berndt, 1982; Hunter and Youniss, 1982; Ladd and Emerson, 1984; Sharabany, Gershoni, and Hofman, 1981; Youniss, 1980), although intimacy is stressed earlier for girls than boys (Berndt, 1983; Smollar and Youniss, 1982). Berndt (1982b) has suggested that the benefits of intimacy are to increase self-esteem and closeness, as well as to

provide a sense of security about one's fears and anxieties. From the perspective of Bell et al. (1985), feelings of closeness and security provided by intimate contact may also motivate children to surmount conflicts in order to maintain their positive affective bond.

Finally, children differentiate their friends from other peers in their behavioral interactions. In comparison to nonfriends, interactions between friends during enjoyable activities and noncompetitive problem-solving tasks are characterized by a higher degree of mutual social responsiveness (Foot et al., 1977; Newcomb and Brady, 1982) and prosocial or positive intentions and behavior (Berndt, 1981b; Newcomb et al., 1979). In one study of friends versus nonfriends under competitive conditions, 5- to 9-year old children were observed to heed more appeals for sharing from friends than from other peers, and when an appeal was rejected, to give more extensive reasons for their refusal (Carlson Jones, 1985).

Other studies, however, indicate that in some conditions friends help or share less with each other than nonfriends. Berndt (1981a) observed that in a competitively structured situation in which helping or sharing had a cost for the participants in terms of rewards gained, boys in kindergarten through fourth grade shared less with friends than with other classmates, and complied with friends' requests less often than with those of classmates'. This

finding was replicated on a similar task for both boys and girls in fourth grade by Berndt, Hawkins, and Hoyle (1986), and for third- and fourth-grade boys by Staub and Noerenberg (1981). The girls in Berndt's (1981a) study shared equally with their partners, regardless of whether the partner was a friend or another classmate, and usually complied with the requests of both friends and classmates. The girls' response illustrates a preference for equality that has been found in other research (Carlson Jones, 1985; Skarin and Moely, 1976), and that characterizes conflict resolution in nonfriend peers (Morgan and Sawyer, 1967).

Berndt (1982a) attributes the finding of less prosocial behavior in pairs of male friends to the competitive structure of the task situation, one in which sharing freely might have resulted in a child's getting fewer rewards than the friend. The boys apparently viewed themselves as competing with their friends, and they shared less to avoid losing the competition. He suggested that boys may compete with friends more than girls do because they are generally more competitive (Skarin and Moely, 1976), or because they considered performance on the experimental tasks as more important than did the girls. The latter suggestion is supported by Tesser et al. (1984), who found that fifth- and sixth-grade children named as friends those classmates whose performance was inferior to their own on relevant activities, but better than their own on irrelevant

activities. To the extent that the boys in Berndt's (1981a) study perceived the task situation as a contest that they could lose by sharing with their friend, and to the extent that winning the contest was more relevant to their self image than it was for girls, they may have been more motivated to perform at a superior level to their friends.

The finding that in some situations children compete with their friends but not with their nonfriends suggests that with nonfriend peers, children may behave more prosocially in order to normalize the situation and avoid conflict. In contrast, children interacting with their friends may use competitive situations for purposes of social comparison. Research indicates that comparative evaluations develop between the ages of 8 and 10 years (Aboud, 1985a; Nicholls, 1978; Ruble, Boggiano, Feldman, and Loebl, 1980). Thus, the kindergarteners in Berndt's (1981a) study may not have been engaging in social comparison, whereas the older boys, and the children of both sexes in the study by Berndt et al. (1986), may have been comparing their own with their friends' abilities on the competitive experimental task.

In summary, many studies provide descriptive accounts of the differences between friendships and other peer relationships. Except for boys, and sometimes girls, in competitive situations, studies consistently support the view that interactions with friends are more positive for

children than interactions with nonfriend peers. Few studies, however, have actually examined the contributions of friendship to children's social or cognitive development. Two early studies established correlational relationships between having a friend and more mature social-cognitive and affective perspective-taking skills (Mannarino, 1976; McGuire and Weisz, 1982). These results support the conclusion that friendship is related to more mature social-cognitive skills, but they do not permit the conclusion that friendship actually influences the development of these skills.

The first study which examined the influence of friendship on processes of social-cognitive growth was conducted by Aboud (1985b). Based on the hypothesis that mutual liking between friends would reduce the need to conform (Kelley and Shapiro, 1954; Kiesler and Kiesler, 1969), she showed that 7- and 9-year old children working alone on a skills acquisition task conformed more to the incorrect solutions attributed to a neutral classmate than to those attributed to a friend. The author suggested that with peers from whom approval or liking is desired but not guaranteed, the child may be more motivated to conform (Aboud, 1981; Hoving, Hamm, and Galvin, 1969), whereas the mutual approval and liking of friends reduces this need for approval.

In a second study, Nelson and Aboud (1985) examined the

influence of friendship on cognitive growth in the context of social conflict. They hypothesized that due to characteristics of friendship such as mutual liking (Bigelow and LaGaipa, 1975), openness and honesty (Smollar and Youniss, 1982), and a positive interactional quality (Newcomb et al., 1979), social conflict between friends would be more beneficial than conflict between nonfriend peers in promoting social-cognitive growth. They paired third- and fourth-grade children with either a friend or a nonfriend who initially agreed or disagreed with their own answer to a social problem, and asked the children to discuss the problem. Results for pretest and posttest difference scores indicated that disagreements between friends produced more positive changes in social comprehension scores than disagreements between nonfriends, and also more than agreements between both friends and nonfriends. Among friends, lower scorers changed to the higher scorers' answer more than vice versa, whereas among nonfriends, higher and lower scorers changed equally frequently to the other child's level of answer. These results support that in the context of sociocognitive conflict, friends have a more beneficial impact than nonfriends on social-cognitive growth.

With the aim of identifying social processes which might account for the difference in outcome, Nelson and Aboud (1985) analyzed the process of interaction between

friends and nonfriends. Their results indicated that in comparison to nonfriends, friends who agreed sought more information from their partners, and friends who disagreed offered more explanations of their own answer and made more criticisms of their partner's answer. None of these process variables significantly predicted the amount or direction of change, however. The authors suggested that although differences in interactions between friends and nonfriends were not sufficient to account for response change, they support the view that friends differ from nonfriends in their problem-solving interactions in ways which may enable friends to respond more constructively to conflict.

Rationale for the Present Study

From the theoretical perspective of Mugny et al. (1984), the present study hypothesized that other aspects of friendship than those examined by Nelson and Aboud (1985) would promote social-cognitive growth following a sociocognitive conflict. Specifically, children were expected to benefit more from a disagreement with a friend than with a nonfriend due to a higher probability of regulating the conflict in the cognitive domain rather than the social domain, thus maximizing the possibility of social-cognitive growth.

The rationale for the above proposal is based on three characteristics of friendship that have been identified in previous research. First, due to perceived and actual

similarity on demographic and personality variables (e.g., Epstein, 1983b; Kandel, 1978a), it was expected that friends would be less likely to socially differentiate, that is to find or create a social difference to which to attribute the cognitive conflict. On the contrary, the similarity of friends was expected to enhance children's acceptance of their friend's response as a valid alternative to their own, and provide an anchorage for a new cognitive construction.

Second, it was expected that friends would be more likely to benefit from sociocognitive conflict due to a lower probability of conformity, which would also facilitate a cognitive regulation of the conflict. Two aspects of friendship that reduce the probability of conformity are equal status and mutual liking. In general, interactions between peers who are symmetrical in status (Piaget, 1932) increase the probability that each child has an equal part in making decisions and recognizes the same rights in other children. The equal status of friends over peers in general may also be enhanced by perceived and actual similarity on demographic and attitudinal factors. In addition, mutual liking between friends (Bigelow and LaGaipa, 1975) has been shown to reduce the children's need to conform to opinions held by their friends (Aboud, 1985b).

Third, several characteristics of friendship suggested that friends would resolve a conflict without normalization, an avoidance of discussion and debate. Due to a desire to

maintain their ongoing positive relationship, friends may be more motivated to resolve the conflict. The long-term relationship may also contribute to an accumulation of friendship "credits", which have been hypothesized to allow for the performance of inappropriate behavior without personal derogation (Hollander, 1958). Friendship credits may alleviate children of the fear that a single conflict will lead to the dissolution of the friendship. As a result, friends would feel more secure about engaging in active debate, including the exploration and criticism of their own and their partner's viewpoints, as was observed in Nelson and Aboud's (1985) study. With an increased interest in social comparison around the age of 8 or 9 years (e.g., Ruble et al., 1980), children may also strive to participate in the comparison of ideas which accompanies a conflict. Although studies to date have reported more competition between male friends than between female friends, social comparison operates in children of both sexes (Aboud, 1985a), suggesting that studies which examine relevant dimensions or tasks for girls may show a similar preference for social comparison with friends over nonfriends.

Based on the theoretical perspective of Mugny et al. (1984), and on the research literature on friendship to date, the following hypotheses were generated for investigation in the present study:

(1) That in their perceptions, children would

differentiate their friends from their nonfriend peers. Specifically, children were expected to perceive their friends as more similar to themselves than their nonfriends, to perceive their friends as more competent than their nonfriends, and to prefer their friends as playmates. Previous findings on social comparison suggested that children, or perhaps only boys, would also perceive themselves to be more competent than their friends at a favorite school subject. Due to younger children's less well differentiated concept of friendship, a secondary hypothesis was that the differentiation between friends and nonfriends would be stronger for older children.

(2) That children would show greater response change after discussion of a social perspective-taking problem with a friend compared with a nonfriend. Based on a less clear differentiation of friendship for younger children, a secondary hypothesis was that this effect would be stronger for older than for younger children.

## Method

### Subjects

Ninety-four francophone children in grade 1-2 (mean age = 7 years 4 months) and grade 3-4 (mean age = 9 years 11 months) participated in the study. The children attended three schools in the greater Montreal area. Only children who had at least one reciprocal and durable same-sex friend

were included, in order to control for personality factors which might prevent children from forming a friendship. Socioeconomic status was estimated on the basis of parental education, scored according to Hollingshead (1975). The mean score for parental education was 4.13 (s.d. = 1.25), indicating that children came from families in which the parents had, on average, a high school education. Written parental consent was obtained for all participating children. Parental consent letters are given in Appendix F. The total response rate for the 581 letters sent was 72.8%, with an acceptance rate of 55.4% and a rejection rate of 17.4%.

As shown in Table 12, the final sample included 12 subjects in all cells except for grade 3-4 girls in the nonfriend condition (n = 10). In order to avoid statistical complications created by unequal cell sizes, two dummy subjects were created for this cell by replacing the missing values by the mean values of the other subjects in the cell.

Measures

Friendship Rating Scale. Consistent with the accepted definition of friendship as a positive and stable relationship between two children (Mannarino, 1976), durable and reciprocal friendships were identified for each participating child on the basis of a classroom roster administered on two occasions, two weeks apart (see Appendix G). Children for whom parental permission was obtained were

Table 12

Sample Frequencies for Study 2 by Grade, Sex, and Friendship Group (n = 94)

| | Sex | |
|---|---|---|
| | Boys | Girls |
| Grade 1-2 | 24 | 24 |
| Friend Group | 12 | 12 |
| Nonfriend Group | 12 | 12 |
| Grade 3-4 | 24 | 24 |
| Friend Group | 12 | 12 |
| Nonfriend Group | 12 | 10 |
| Total | 48 | 46 |

given a list of all of the same-sex participating children in their class. In a column to the left of the list of names, they were asked to mark 1 beside the names of their "best friends", 2 beside the names of their "good friends", 3 beside the names of "OK friends", and 4 beside the names of children who were "OK kids but not really friends". They were instructed to leave blank the spaces next to the names of children whom they did not like very much (St. John and Lewis, 1975). In a column to the right of the list of names, children are asked to indicate how much they liked to play with each child, on a scale from 1 (don't like to play with) to 4 (like to play with alot). The friendship nomination procedure was used to give children the freedom to specify the category of peer relationship and to select few or many peers as friends. Following the observation with the first class to whom the questionnaire was administered that several grade 1 children wanted to mark a 1 beside the names of all of the children on the list, the only restriction imposed by the experimenter was that the children name only two peers as best friends. This restriction was imposed with the goal of encouraging some discrimination among their peers by the children. The degree of liking was included as a measure of popularity. Correlations computed between popularity ratings and the degree of friendship nominations of friends (1,2) and nonfriends (3,4) yielded a significant positive correlation

between popularity ratings and the degree of the friendship nomination for friends ($r$ = .31, $p$ < .05), but not for nonfriends ($r$ = .07, n.s.). That is, children who were nominated with a 1 were also more popular than those nominated with a 2, whereas there was no relationship between popularity and the degree of the relationship for nonfriends.

Pairs of reciprocal and durable friends were identified as children who nominated each other with a 1 or 2 on the two occasions that the roster was administered. Pairs of nonfriends were identified as children who nominated each other with a 3 or 4 on the two administrations. Children were not paired with partners for whom they had left the nomination space blank.

Chumship Checklist. The Chumship Checklist (Mannarino, 1980) was used to assess the quality of the children's friendships with the goal of validating the identification of friend and nonfriend pairs as determined by the Friendship Rating Scale. The Chumship Checklist includes 17 items which the child may check off as relevant to his/her relationship with another child (see Appendix G). The more items the child checks off, the greater is considered the quality of the friendship. In the present study, children were asked to indicate whether each item applied to his/her relationship with a reciprocal friend and a nonfriend by answering that it applied "Always", "Sometimes", or

"Never". This procedure was a modification of the original measure which asks children to answer only by affirming or disconfirming (yes or no); it was implemented in order to increase the sensitivity of the questionnaire to differing qualities of relationships with peers. This method of administration yielded two scores for each questionnaire: (a) the number of items checked off as relevant to the relationship (minimum = 0 and maximum = 17), and (b) the total score for each questionnaire, calculated as the weighted sum of the responses to the items where "Always" received a score of 2, "Sometimes" received a score of 1, and "Never" received a score of 0 (minimum = 0 and maximum = 34). The two scores were positively correlated at $r = .91$, $p < .001$, for the Friend questionnaire, and $r = .95$, $p < .001$, for the Nonfriend questionnaire, therefore only the total score was used in the analyses. The order of administration of the questionnaires (friend, nonfriend) was counterbalanced across subjects.

Friend Perception Task. The Friend Perception Task, an adapted version of the Race Perception Task used in Experiment 1, was used to assess the perceptions that each subject had about children who were their friends and nonfriends. Materials for this measure included a 60-cm. cardboard which is marked off by 20 equidistant lines, and 3 1/2" X 5" colour photographs of participating children in

each class. Photographs were taken at the time of administration of the Friendship Rating Scale.

In the Friend Perception Task, each subject was shown photographs of same-sex children in his/her class. One of the children was a reciprocal friend and one was a nonfriend, identified using the Friendship Rating Scale. In the aim of also comparing second-best friends and nonfriends, some children were also shown photographs of a second reciprocal friend or nonfriend. Due to small and unequal cell sizes for these comparisons, however, only the first reciprocal friend and nonfriend were used in the final analysis.

In choosing target photographs for the Friend Perception Task, an attempt was made to equate photographed children in the friend and nonfriend groups for popularity, as measured by the degree of liking at the first administration of the Friendship Rating Scale. A repeated measures analysis of variance indicated, however, that children in the friend group of target photographs were more popular than children in the nonfriend group, $F$ (1,86) = 39.25, $p < .001$ (means of 3.98 and 3.37 for friend and nonfriend target children, respectively). These results were taken into consideration when interpreting the results of the Friend Perception Task.

The Friend Perception Task consisted of three items, which assessed the degree to which the subject perceived

photographed friend(s) and nonfriend(s) to be (a) similar to him/herself, (b) preferred as a playmate, and (c) competent at a favorite school subject. The child answered each question by placing the photographs on the 60-centimeter cardboard, where closer to the self (a score of 0) indicated greater perceived similarity, greater play preference, and greater competence. For the item on perceived competence, the child also placed on the board a line drawing representing the self to indicate his/her own perceived competence at the chosen school subject. The order of presentation of questions in the measure was counterbalanced across subjects. Administration instructions and response forms for the measure are given in Appendix G.

Interpersonal Problem Solving Measure. An adaptation of the Interpersonal Problem-Solving measure (Marsh, 1982) was used to measure the level of social perspective-taking ability. Subjects were administered the measure prior to and following the presentation of a conflictual answer by a child who was their friend or nonfriend. The Interpersonal Problem-Solving measure used in Experiment 1 was expanded to fit the procedures of Experiment 2 via the addition of two new dilemmas with themes similar to the Circus and Frisbee stories. Similar to the Circus dilemma is the Ski dilemma, in which the subject must decide which of 3 children to take on a ski trip, when the number of places available in the car is limited. Similar to the Frisbee dilemma is the Ball

dilemma, in which children must decide who among three children is/are responsible for the loss of a soccer ball belonging to their father. As before, the four dilemmas were illustrated with coloured pictures as they were read to each child, with separate forms of the stories for males and females. The order of stories presented at pretest was randomized across subjects. The Revised Interpersonal Problem-Solving Measure used in Experiment 2 is given in Appendix G.

Interrater reliability for scores at pretest and posttest was calculated for 20% of the protocols. Percent agreement between the two coders was 95.8% (Cohen's kappa = .953).

Procedure

The procedure consisted of three stages: (1) the identification of subjects and their friends and nonfriends using the Friendship Rating Scale; (2) individual testing on the Chumship Checklist, the Friend Perception Task, and the pretest Interpersonal Problem-Solving Measure, and (3) interaction between pairs of friends or nonfriends to induce a sociocognitive conflict, followed by the posttest on the Interpersonal Problem-Solving Measure.

Stage 1 involved the two administrations of the Friendship Rating Scale, spaced two weeks apart. Participating boys and girls were removed in a group from the class at a time arranged with their teacher, and

requested to complete the form. Based on the two administrations of the rating scale, the author identified subjects who had at least one reciprocal same-sex friend for whom the friendship ratings were a 1 or a 2 at both administrations of the scale. These subjects were then assigned, as randomly as possible, to the Friend or Nonfriend condition for the sociocognitive conflict manipulation in Stage 3 of the experiment. As in Experiment 1, a no-treatment control group was not included because the focus of the study was on the differential effect of friendship status of peer on social-cognitive growth, and not on the simple effect of the sociocognitive conflict.

An attempt was made to equate subjects assigned to the Friend and Nonfriend condition for popularity, measured by the mean liking rating they received on the first administration of the Friendship Rating Scale. An analysis of variance indicated, however, that children in the Friend condition were more liked than children in the Nonfriend condition, $F$ (1,88) = 11.95, $p$ = .001 (means of 4.00 and 3.57 for children in the Friend and Nonfriend conditions, respectively). This difference was likely attributable to the fact that as many children as possible who nominated each other as best friends (i.e., reciprocal 1's) were assigned to the Friend condition, in combination with the fact that the popularity ratings and friendship ratings were significantly correlated ($r$ = .31, $p$ < .05). The overlap

between popularity and the degree of friendship was taken into consideration when interpreting the results of the Interpersonal Problem-Solving Measure.

Stage 2 involved an individual testing session, with children tested by one of three adult women, the author and two undergraduate students in psychology. During this session, the tester administered the Chumship Checklist, the Friend Perception Task, and the pretest of the Interpersonal Problem-Solving measure. Following the pretest, the child's answers were scored for solution adequacy, according to the revised scoring scheme (See Appendix G).

Following the pretests, a story was chosen for discussion by pairs of friends or nonfriends according to the criterion that the children's answers differed. The average difference in scores between the responses of the two children in the pair was two levels (mean = 2.33, s.d. = .99). An attempt was made to balance the number of pairs who discussed each story. In the final sample, the Circus story was discussed by 11 pairs, the Frisbee story was discussed by 14 pairs, the Ski story was discussed by 14 pairs, and the Ball story was discussed by 8 pairs.

During the final testing session held approximately one week later (mean number of days = 6.69 days, s.d. = 2.11 days), a sociocognitive conflict was induced for the chosen dilemma of the Interpersonal Problem-Solving measure. Children were brought in pairs of friends or nonfriends to

the testing room. The experimenter reviewed the story chosen for discussion. With the goal of ensuring that each subject was aware of the differing answer of their partner, she read each child's answer to the pair. The children were then instructed to discuss their answers for four minutes. The word "discussion" was defined by the experimenter as telling their partner their own answer, thinking of new ways to solve the dilemma, and deciding together on the best solution. These instructions were based on the convergent and divergent instructions used by Nelson and Aboud (1985). In their study, instructional set was found to have no effect on response change, therefore in the present study it was decided to ask children to diverge (i.e., think of new ways to solve the dilemma) and then converge (i.e., decide together on the best solution) in order to encourage them to discuss as long as possible. The experimenter left the children together in the room for four minutes, or for a shorter or longer period if the children terminated the discussion themselves by coming to get the experimenter, or insisted that they were not yet finished their discussion after four minutes. All pairs of children reported that they had agreed on a best solution. The discussion was tape recorded, in order to verify that the children were indeed discussing. (Two of the 47 discussions were not tape recorded due to mechanical failure). The average length of discussion was 3 1/2 minutes (mean = 3.50, s.d. = 1.30).

The discussions were later coded to examine qualitative aspects of the interactions between pairs of friends and nonfriends.

Following the discussion, children were retested on all four stories of the Interpersonal Problem-Solving measure by a different examiner than the one who had tested them at pretest. Pretest and posttest scores on the discussed dilemma were then analyzed to assess the effect of the sociocognitive conflict. Pretest and posttest scores on the three other stories were analyzed to assess the effect of the sociocognitive conflict on related and unrelated dilemmas.

With the goal of obtaining a rough measure of whether change demonstrated at posttest was maintained over time, followup letters were sent home with participating children two weeks following the completion of posttesting for all children. Parents were requested to read to their child the dilemma that the child had discussed during the interaction, to note the child's solution on a specified form, and mail the form to the laboratory. Responses were received for 58 of the 94 subjects, with an average of 5 weeks (mean = 35.8 days, s.d. = 9.08 days) between the dates of posttest and followup measures. Of the 47 pairs of children, however, followup scores were obtained for both partners for 13 pairs only, 5 in grade 1-2 and 8 in grade 3-4. Due to this small sample size, and due to concerns about the reliability of

data collected by the parents, analyses of followup data are considered exploratory.

## Results

In the first section of the results, differences in the quality of the relationships with friends and nonfriends identified using the Friendship Rating Scale are validated via analyses of the Chumship Checklist. Second, perceptions of children toward friends and nonfriends as measured by the Friend Perception Task are examined. Third, analyses of the Interpersonal Problem-Solving measure are presented which validate developmental patterns in the measure, and which examine the effect of friendship status of peer on social-cognitive growth following a sociocognitive conflict. The final section presents group differences in the quality of the discussion involving sociocognitive conflict.

Results of preliminary analyses related to the psychometric properties of the measures and initial preparation of the data set (i.e., data reduction, analyses of outliers, assumptions of normality and homogeneity of variance, and school differences) are reported in Appendix H. Anova summary tables are given in Appendix I. Correlations for measures used in Experiment 2 are given in Appendix J.

Validation of Friends and Nonfriends using the Chumship Checklist

The quality of the relationship of friend and nonfriend pairs which had been identified previously using the Friendship Rating Scale was assessed via the Chumship Checklist. The scale was found to be internally reliable, Cronbach's alpha = .80 and .79 for the friend and the nonfriend totals respectively. Scores for the friend and nonfriend totals were uncorrelated, $r$ = .06, n.s., reflecting that relations with friends and nonfriends were independent.

A repeated measures analysis of variance was conducted on the total Chumship scores, with grade and sex entered as between-group factors and friendship status of peer (friend, nonfriend) entered as the within-subject factor.

There was a significant effect of friendship status of peer, $F$ (1,92) = 87.30, $p < .0001$, which confirmed that total chumship scores for friends were greater than for nonfriends (means (s.d.) of 14.22 (5.63) and 7.50 (4.71) for friends and nonfriends, respectively). This result validated the identification of friends and nonfriends by the Friendship Rating Scale. There were no significant effects of grade, $F$ (1,92) = .04, n.s., nor of sex, $F$ (1,92) = .30, n.s., nor were there any significant interactions.

Perceptions of Friends and Nonfriends

Three repeated measures analyses of variance were conducted to examine group differences in measures of perceived similarity (friend, nonfriend), preference (friend, nonfriend), and perceived academic competence (self, friend, nonfriend). Grade and sex were entered as between-group factors and friendship status of photographed peer (friend, nonfriend) was entered as the within-subject factor.

Perceived similarity. Analyses of variance indicated a significant main effect of friendship status of photographed peer, $F$ (1,92) = 12.30, $p$ = .001. Children rated their friends as more similar to themselves than their nonfriends (means (s.d.) of 8.44 (4.92) and 11.32 (5.62) for friends and nonfriends, respectively). There were no main effects of grade, $F$ (1,92) = .30, n.s., nor of sex, $F$ (1,92) = .87, n.s., nor did any interaction effects reach significance.

Preference. Analyses of variance indicated a significant main effect of friendship status of photographed peer, $F$ (1,92) = 108.77, $p < .0001$. Children preferred to play with their friends than with their nonfriends (means (s.d.) of 2.55 (3.81) and 10.81 (5.86) for friends and nonfriends, respectively). There were no significant main effects of grade, $F$ (1,92) = .38, n.s., nor of sex, $F$ (1,92) = 1.55, n.s., nor did any interaction effects reach significance.

Perceived competence. Analyses of variance indicated a significant main effect of friendship status of photographed peer, $F$ (2,184) = 45.04, $p < .0001$. As indicated by Tukey HSD pairwise comparisons and shown in Table 13, children rated their friends as more competent than their nonfriends, and they rated themselves as more competent than their friends. There was also a significant main effect of grade, $F$ (1,92) = 4.88, $p < .05$, which indicated that subjects in grade 1-2 gave higher ratings of competence to all target children than did subjects in grade 3-4 (means of 5.59 and 6.83 for grades 1-2 and 3-4, respectively). There was no significant effect of sex, $F$ (1,92) = 2.22, n.s., nor did any interaction effects reach significance.

Interrelationships between Ratings of Friends and Nonfriends. Correlational analyses between items on the Friend Perception Task were performed to explore interrelationships between measures of perceived similarity, preference, and perceived competence. Following multiple regression analyses which indicated that the pattern of correlations differed for younger and older children (see Appendix J), correlations are presented separately for the two age-groups (see Tables 14 and 15).

For children in grade 1-2, but not for children in grade 3-4, a significant positive correlation between preference for friends and perceived self-competence ($r$ = .59, $p < .05$, versus $r$ = .13, n.s., for children in grades

Table 13

Competence Ratings for Self, Friends, and Nonfriends

| Grade | Friendship Status | | |
|---|---|---|---|
| | Self | Friend | Nonfriend |
| | M (s.d.) | M (s.d.) | M (s.d.) |
| Total (96) | 3.61 (3.55) | 5.70 (4.84) | 9.31 (4.79) |
| Grades 1-2 (48) | 2.77 (3.47) | 4.96 (4.83) | 9.04 (4.86) |
| Grades 3-4 (48) | 4.46 (3.45) | 6.44 (4.79) | 9.58 (4.75) |

Table 14

Intercorrelations between Items in the Friend Perception Task: Grade 1-2 (n = 48)

| | Simfrd | Prffrd | Comfrd | Simnon | Prfnon | Comnon | Comself |
|---|---|---|---|---|---|---|---|
| Simfrd | -- | .11 | .09 | -.31 | -.01 | .04 | .07 |
| Prffrd | | -- | .48* | -.20 | -.25 | -.21 | .59* |
| Comfrd | | | -- | -.09 | -.01 | .06 | .26 |
| Simnon | | | | -- | .16 | .16 | -.07 |
| Prfnon | | | | | -- | .55* | -.16 |
| Comnon | | | | | | -- | -.23 |
| Comself | | | | | | | -- |

Variable Names

Simfrd - Similarity rating for friend
Prffrd - Preference rating for friend
Comfrd - Competence rating for friend
Simnon - Similarity rating for nonfriend
Prfnon - Preference rating for nonfriend
Comnon - Competence rating for nonfriend
Comself - Competence rating for self

Bonferroni Family-Wise Alpha

* $p < .05$

Table 15

Intercorrelations between Items in the Friend Perception Task: Grade 3-4 (n = 48)

| | Simfrd | Prffrd | Comfrd | Simnon | Prfnon | Comnon | Comself |
|---|---|---|---|---|---|---|---|
| Simfrd | -- | .08 | .32 | .06 | .01 | -.16 | .02 |
| Prffrd | | -- | .06 | -.27 | -.25 | -.08 | .13 |
| Comfrd | | | -- | .27 | .25 | .09 | .16 |
| Simnon | | | | -- | .52* | .37* | -.20 |
| Prfnon | | | | | -- | .46* | .16 |
| Comnon | | | | | | -- | .17 |
| Comself | | | | | | | -- |

Variable Names

Simfrd - Similarity rating for friend
Prffrd - Preference rating for friend
Comfrd - Competence rating for friend
Simnon - Similarity rating for nonfriend
Prfnon - Preference rating for nonfriend
Comnon - Competence rating for nonfriend
Comself - Competence rating for self

Bonferroni Family-Wise Alpha

* $p < .05$

1-2 and 3-4, respectively) was found. Using Fisher's $r$ to $z$ transformation (Ferguson, 1976), the difference between the correlations at the two age levels was found to be significant, $p < .01$. For children in grade 1-2, positive correlations were also found between preference for and perceived competence of friends ($r = .48$, $p < .05$) and of nonfriends ($r = .55$, $p < .05$).

For older children, positive correlations were found between preference and perceived competence ratings for nonfriends ($r = .46$, $p < .05$), similarity and preference ratings for nonfriends ($r = .52$, $p < .05$), and similarity and competence ratings for nonfriends ($r = .37$, $p < .05$). For friends in grade 3-4, relationships between the three dimensions were nonsignificant, though the correlation between perceived similarity and perceived competence for friends ($r = .32$, n.s.) did not differ from that for nonfriends ($r = .37$, $p < .05$).

Since popularity scores were significantly different for groups of photographed children used as friend and nonfriend targets, correlations were computed between popularity scores at the first administration of the Friendship Rating Scale, and the ratings given on the Friend Perception Task. This analysis was conducted to ensure that differences in ratings of perceived similarity, preference, and perceived competence between friend and nonfriend targets were not confounded with differences in popularity

scores.

There was a significant correlation between popularity and preference for friend targets, $r = -.36$, $p < .05$ (negative correlation because low scores for preference indicate liking on the Friend Perception Task), indicating that more popular children were also better liked than less popular children by their friends. This correlation did not differ, however, from the corresponding nonsignificant correlation of $r = -.19$, n.s., between popularity and preference for nonfriend targets.

For nonfriend targets, there was a significant correlation between popularity and perceived competence, $r = -.33$, $p < .05$, indicating that more popular children were rated as more competent by their nonfriends. Once again, this correlation did not differ from the corresponding nonsignificant correlation of $r = -.17$, n.s., for friend targets. The correlations between perceived similarity ratings and popularity were nonsignificant for friend and nonfriend targets ($r = .06$, n.s., and $r = -.23$, n.s., respectively).

Summary. In summary, the results of the Friend Perception Task indicate that children differentiated between their friends and their nonfriends along the dimensions of perceived similarity, preference, and perceived competence. Along the dimension of perceived competence, children rated their friends as more competent

than their nonfriends, though as less competent than themselves. Children in grade 1-2 rated all groups of children (self, friends, nonfriends) as more competent than did children in grade 3-4. Correlational analyses indicate different patterns of relationships between the three dimensions for younger and older children. For younger but not for older children, preference for a friend was positively related to perceptions of self-competence. For younger children and for both friends and nonfriends, ratings of preference and perceived competence were positively correlated. In contrast, older children's ratings of perceived similarity, preference, and perceived competence were correlated positively for nonfriends only, whereas their ratings of friends were independent of each other. There was minimum overlap (shared variance of 10% - 13%) between popularity scores and ratings on the Friend Perception Task, at least within friend and nonfriend groups, in that only two of six possible correlations were significant. The low correlations indicate that ratings on the Friendship Perception Task were largely independent (90% or more of unshared variance) of popularity ratings.

Developmental Changes on the Interpersonal Problem-Solving Measure

As a preliminary step to examining developmental changes in interpersonal problem-solving skills, interrelationships between the four stories on the

Interpersonal Problem-Solving measure, two of which came from the original Marsh (1982) measure, and two of which were created for this study, were explored. Correlations between pairs of pretest and posttest scores indicated that as expected, the Circus and Ski stories and the Frisbee and Ball stories formed two pairs of stories that were significantly correlated with each other but unrelated to the other pair of stories. For each story, pretest and posttest scores were significantly correlated (see Table 16).

In order to examine developmental patterns in interpersonal problem-solving skills as measured by the revised Interpersonal Problem-Solving measure, and to examine differences among the four stories, a repeated measures analysis of variance was conducted on the pretest scores, with grade and sex entered as between-subject factors, and story as a within-subject factor. The Greenhouse-Geisser correction was used due to violation of the sphericity assumption. This analysis indicated a significant main effect for story, $F$ (2.57, 236.45) = 5.09, $p < .01$. Scheffé post hoc analyses showed that scores for the Frisbee story were significantly lower than the mean score for the three other stories combined (means of 4.89 versus 5.46, respectively), and that average scores for the Frisbee and Ball stories combined were lower than average scores for the Circus and Ski stories combined (means of

Table 16

Intercorrelations between Stories in the Interpersonal Problem-Solving Measure (n = 96)

| | Preski | Prefris | Preball | Pstcirc | Pstski | Pstfris | Pstball |
|---|---|---|---|---|---|---|---|
| Precirc | .51* | .21 | .26 | .65* | .43* | .28 | .22 |
| Preski | -- | -.00 | .22 | .35* | .34* | .13 | -.01 |
| Prefris | | -- | .31* | .19 | .06 | .50* | .31* |
| Preball | | | -- | .15 | .12 | .25 | .40* |
| Pstcirc | | | | -- | .67* | .18 | .11 |
| Pstski | | | | | -- | .12 | .09 |
| Pstfris | | | | | | -- | .44* |
| Pstball | | | | | | | -- |

Variable Names

Precirc - Pretest score for Circus story
Preski - Pretest score for Ski story
Prefris - Pretest score for Frisbee story
Preball - Pretest score for Ball story
Pstcirc - Posttest score for Circus story
Pstski - Posttest score for Ski story
Pstfris - Posttest score for Frisbee story
Pstball - Posttest score for Ball story

Bonferroni Family-Wise Alpha

* $p < .05$

5.08 and 5.57 respectively; see Table 17). This result suggests that dilemmas involving the attribution of responsibility were more difficult than stories involving the distribution of resources. There was also a significant main effect of grade, $F$ (1,92) = 10.42, $p < .01$, which indicated that subjects in grade 3-4 received higher scores than subjects in grade 1-2. There was no effect of sex, $F$ (1,92) = 1.12, n.s., nor were there any significant interactions.

Since children's scores differed significantly by story, and since interest was in the growth on each story separately, separate analyses of variance were conducted on each of the four pretest scores (Huberty and Morris, 1989). For each analysis, grade and sex were entered as between-subject factors. These analyses indicated a main effect of grade for the Circus story, $F$ (1,92) = 10.18, $p < .01$, the Ball story, $F$ (1,92) = 4.55, $p < .05$, and a trend for grade for the Ski story, $F$ (1,92) = 3.67, $p = .059$. For all three stories, subjects in grade 3-4 received higher scores than subjects in grade 1-2 (see Table 17). For the Frisbee story, as in Experiment 1, the main effect of grade was nonsignificant, $F$ (1,92) = 1.60, n.s.. For all stories, the main effect of sex was nonsignificant, as was the interaction between grade and sex.

Summary. Analyses of variance on pretest scores of the Interpersonal Problem-Solving measure indicate that three of

Table 17

Pretest Scores on Stories in the Interpersonal Problem-Solving Measure

| Grade (n) | Story | | | |
|---|---|---|---|---|
| | Circus | Ski | Frisbee | Ball |
| | M (s.d.) | M (s.d.) | M (s.d.) | M (s.d.) |
| Total (96) | 5.75 (1.53) | 5.38 (1.51) | 4.89 (1.85) | 5.26 (2.09) |
| Grades 1-2 (48) | 5.27 (1.67) | 5.08 (1.56) | 4.65 (1.86) | 4.81 (2.22) |
| Grades 3-4 (48) | 6.23 (1.21) | 5.67 (1.42) | 5.13 (1.82) | 5.71 (1.87) |

the four stories showed developmental changes in interpersonal problem-solving skills. On the fourth story, the Frisbee story, the nonsignificant difference between scores for children in grades 1-2 and 3-4 indicate that there was no change with age. Post hoc analyses showed that on stories involving the attribution of responsibility, children received lower scores than on stories involving the distribution of resources, suggesting that the theme of attributing responsibility is more difficult for children to solve than a theme involving sharing of resources.

The Effect of Friendship on Social-Cognitive Growth

The hypothesis that friendship status of peer would affect growth in interpersonal problem-solving skills following a sociocognitive conflict was tested by analyzing group differences in pretest and posttest scores for the four stories on the Interpersonal Problem-Solving measure. Since the experimental manipulation of sociocognitive conflict and discussion was conducted with pairs of children rather than with individuals, analyses were performed with pairs rather than with subjects as the unit of analysis. There were thus 48 pairs included in the following analyses.

As explained in the method section, each pair of children discussed the story for which their pretest scores, and thus solutions to the dilemma, differed. Since pairs of children discussed different stories, pretest and posttest

scores on each story were renamed relative to the story discussed by the pair. This procedure resulted in pretest and posttest scores on the discussed story and on the three nondiscussed stories: (a) the story which correlated with the discussed story, (b) Marsh's (1982) original uncorrelated story, and (c) the new uncorrelated story.

In order to increase degrees of freedom, preliminary analyses were conducted to screen for sex differences in pretest and posttest scores on the four types of story. Analyses revealed no main effect of sex, nor any significant two-way interactions with grade, time of testing (pretest, posttest), or level of discusser (high at pretest, low at pretest). The only significant interaction effect was between sex and friendship group for Marsh's original uncorrelated story, $F$ (1,40) = 4.63, $p < .05$. Given the absence of systematic significant effects of sex on the discussed or correlated stories, it was considered appropriate to combine the sample across sex for subsequent analyses.

Preliminary analyses were also conducted separately on each of the four types of story (discussed, correlated, original unrelated, new unrelated). Since the main goal of analyses was to examine the outcome of the sociocognitive conflict for pairs of friends versus nonfriends following the peer discussion, and since analyses revealed no differences among the three nondiscussed stories, it was

decided to combine the scores of the nondiscussed stories in a single analysis.

Two repeated measures analyses of variance were thus conducted for pretest and posttest scores on (a) the discussed story, and (b) the mean score of the three nondiscussed stories. For each analysis, grade and friendship group were entered as between-pair factors. Time of testing (pretest, posttest) and level of discusser (higher answer at pretest, lower answer at pretest) were entered as within-pair factors.

Discussed story. Analyses of variance for the discussed story indicated a significant interaction effect between grade, time of testing, and level of discusser, $F$ (1,44) = 6.12, $p < .05$. This three-way interaction qualified a significant interaction effect between time of testing and level of discusser, $F$ (1,44) = 28.31, $p < .0001$, and significant main effects for both factors, time of testing, $F$ (1,44) = 7.43, $p < .01$, and level of discusser, $F$ (1,44) = 58.56, $p < .0001$. There was no main effect of grade, $F$ (1,44) = 3.09, $p = .086$, nor of friendship group, $F$ (1,44) = .77, n.s. The hypothesized interaction between friendship group and time of testing was nonsignificant, $F$ (1,44) = .69, n.s..

In order to break down the three-way interaction, repeated measures analyses of variance were performed separately for the two grade levels. In each of these

analyses, friendship group was entered as the between-pair factor, and time of testing and level of discusser were entered as within-pair factors. At grade 1-2, there was a significant main effect of level of discusser, $F$ (1,22) = 27.68, $p < .001$. High level discussers scored higher than low level discussers at both pretest and posttest (means of 6.15 and 4.40, for high level and low level discussers, respectively). The main effect of friendship group was nonsignificant, $F$ (1,22) = .59, n.s.. The main effect of time of testing was also nonsignificant, $F$ (1,22) = .39, n.s., as were all interactions.

At grade 3-4, there was a significant interaction effect between time of testing and level of discusser, $F$ (1,22) = 50.83, $p < .0001$, which qualified significant main effects for both factors: time of testing, $F$ (1,22) = 9.64, $p < .01$, and level of discusser, $F$ (1,22) = 33.99, $p < .0001$. Tukey HSD pairwise comparisons on the means given in Table 18 indicated that scores of low level discussers increased significantly from pretest to posttest. In contrast, scores of high level discussers did not change significantly from pretest to posttest. The main effect of friendship group was nonsignificant, $F$ (1,22) = .22, n.s., as were all other interactions.

Nondiscussed stories. Analyses of variance on mean scores for the three nondiscussed stories indicated a significant main effect of grade, $F$ (1,44) = 17.89, $p <$

Table 18

Pretest and Posttest Scores for Discussed Story

| Group (no. of pairs) | Time of Testing | |
|---|---|---|
| | Pretest | Posttest |
| | M (s.d.) | M (s.d.) |
| Total (48) | | |
| Grades 1-2 (24) | | |
| Low (12) | 4.08 (1.38) | 4.71 (1.76) |
| High (12) | 6.04 (1.43) | 6.25 (1.65) |
| Grades 3-4 (24) | | |
| Low (12) | 4.13 (1.42) | 5.70 (2.03) |
| High (12) | 6.58 (1.18) | 6.08 (1.69) |

.001. This effect showed that subjects in grade 3-4 scored higher than subjects in grade 1-2 (means of 5.99 and 5.10, respectively). A main effect of time of testing, $F$ (1,44) = 9.95, $p < .01$, showed that subjects scored higher at posttest than at pretest (means of 5.74 and 5.36, respectively). The main effect of level of discusser was also significant, $F$ (1,44) = 6.74, $p < .05$, indicating that high level discussers scored higher than low level discussers (means of 5.81 and 5.29, respectively). The effect of friendship group was nonsignificant, $F$ (1,44) = .77, n.s., as were all interactions.

Scores at followup. Given the results of the pre-post analyses for the discussed story, it was of interest to examine whether any changes in reasoning occurred at followup. To achieve this goal, a repeated measures analysis of variance was conducted for the 13 pairs of subjects for whom the follow-up letter had been returned. Five of the pairs consisted of children in grade 1-2 and eight of the pairs consisted of children in grade 3-4. Level of discusser (low, high) and time of testing (pretest, posttest, followup) were entered as within-pair factors. Due to the small sample size, preliminary analyses which included the between-group factor of grade led to singularity of the data matrix, which renders the matrix inversion required for computation of multivariate analyses of variance unstable (Tabachnick and Fidell, 1983).

Therefore, analyses are presented using the within-pair factors only.

Analyses of variance indicated a significant interaction between time of testing and level of discusser, $F$ (2,24) = 5.17, $p < .05$, which qualified significant main effects of level of discusser, $F$ (1,12) = 18.70, $p = .001$, and time of testing, $F$ (2,24) = 5.73, $p < .01$. Tukey pairwise comparisons conducted on the means given in Table 19 indicated that low level discussers progressed in their reasoning from pretest to posttest, and maintained this progress at followup. In contrast, high level discussers showed no significant change from pretest to posttest to followup. There was a significant difference between scores of low level and high level discussers at pretest, but not at posttest or followup.

Summary. The results provide no support for the hypothesis that friendship status of peer influenced social-cognitive growth following a sociocognitive conflict. There were developmental differences, however, in the outcome of the peer discussion. In grade 1-2, children failed to progress from pretest to posttest. By contrast, in grade 3-4 low level discussers progressed at posttest to the level of high level discussers, who did not change from pretest to posttest. On the nondiscussed stories, children in grade 3-4 received higher scores than children in grade 1-2, and all groups of children improved from pretest to

Table 19

Pretest, Posttest and Followup Scores for Discussed Story (n = 13 pairs)

| Level of discusser | Time of testing | | |
|---|---|---|---|
| | Pretest | Posttest | Followup |
| | M (s.d.) | M (s.d.) | M (s.d.) |
| Low (13) | 2.92 (1.19) | 4.62 (2.10) | 5.07 (1.89) |
| High (13) | 5.77 (1.54) | 5.46 (2.15) | 5.69 (1.25) |

posttest. Analysis of followup data for a small sub-sample (n = 13 pairs) indicated that low level discussers maintained their progress at followup, whereas the level of reasoning of high level discussers did not change.

Qualitative Analyses of Discussions between Pairs of Friends and Nonfriends

Given the failure to find an effect of friendship on the outcome of sociocognitive conflict, audiotapes of discussions between pairs of friends and nonfriends were coded for qualitative aspects of the interaction. This analysis was conducted with the goal of examining whether the interactions between pairs of friends versus pairs of nonfriends differed. If the discussions were found to differ, then one could conclude that although friends differ from nonfriends in their perceptions of each other and in their discussions, that these differences did not effect the outcome of the sociocognitive conflict. On the other hand, if the discussions were not found to differ, then the failure to find an effect of friendship on the outcome of sociocognitive conflict could be attributed to similar processes of interaction during the discussion.

The qualitative coding scheme given in Appendix K was developed by the author to assess relevant variables in relation to interactions between pairs of friends versus pairs of nonfriends during a sociocognitive conflict. Sources of reference in developing the code were theoretical

and empirical studies of behavioral interactions between friends and nonfriends including Foot et al. (1977), Gottman (1983), Nelson and Aboud (1985), Newcomb and Brady (1982), and Sullivan (1953). The code consisted of seven variables. Three variables, Total Duration of the Interaction, Duration of Interaction to Closure of Discussion, and Communication Symmetry, consisted of one code for the entire interaction. The remaining four variables, Task Focus, Affect, Collaboration, and Conflict, were coded at 30-second intervals during the interaction, and then averaged to give a mean score for the entire interaction. Interrater reliability was calculated at 100% agreement for 20% of the protocols (Cohen's kappa = 1.0).

Interrelationships among Interaction Variables. Correlational analyses were performed to explore interrelationships among the coded interaction variables. Significant positive correlations were found for three pairs of variables: Total duration of interaction and Duration of interaction to closure ($r$ = .88, $p$ < .05), Communication Symmetry and Affect ($r$ = .50, $p$ < .05), and Task Focus and Collaboration ($r$ = .59, $p$ < .05). All other correlations were nonsignificant.

Given the high correlation between Total Duration and Duration to Closure, Duration to Closure was considered redundant to Total Duration and was not analyzed. In addition, given the moderate correlations between the pairs

of variables, Communication Symmetry and Affect, and Task Focus and Collaboration, it was decided to sum these pairs of variables for use in analyses of variance. The four resulting variables included in analyses of variance were Total Duration, Communication Symmetry/Affect, Task Focus/Collaboration, and Conflict. Correlations between pairs of the four variables were nonsignificant, ranging between $r = -.22$ and $r = .28$ (see Appendix J).

Group differences in Interaction Variables. Given the nonsignificant and low correlations between the four interaction variables, it was considered appropriate to use univariate analyses of variance for each variable separately. For each analysis, grade and friendship group were entered as between-group factors. Preliminary analyses conducted to screen for sex differences resulted in no differences for boys versus girls in the dependent variables. Therefore, consistent with the analyses of pretest and posttest scores on the Interpersonal Problem-Solving Measure, sex was not included as a factor in the analysis. The unit of analysis was pairs of children.

For the variable Conflict, analyses of variance revealed a significant main effect of friendship group, $F(1,42) = 5.20$, $p < .05$, which indicated that interactions of friends involved more conflict than interactions of nonfriends (see Table 20). The main effect of grade was nonsignificant, $F(1,42) = 1.10$, n.s., as was the

Table 20

Means and Standard Deviations of Qualitative Interaction Variables for Pairs of Friends and Nonfriends

| Variable | Friends M (s.d.) | Nonfriends M (s.d.) |
|---|---|---|
| Total Duration (seconds) | 222.70 (67.23) | 233.70 (71.91) |
| Symmetry/Affect (1-10) | 8.26 ( 1.75) | 8.36 ( 1.75) |
| Task Focus/Collaboration (1-10) | 6.93 ( 1.36) | 6.96 ( 1.39) |
| Conflict (1-5) | 1.46 ( 0.55) | 1.17 ( 0.26) |

interaction between friendship group and grade.

For the variables Total Duration, Communication Symmetry/Affect, and Task Focus/Collaboration, there were no significant main effects or interactions, indicating no differences by grade and friendship group on these variables.

Summary. Qualitative analyses of the interactions indicated one difference between pairs of friends versus pairs of nonfriends, specifically that interactions between friends included more conflict than other groups of children. There were no other significant differences between groups of friends and nonfriends in qualitative aspects of the peer discussion.

## Discussion

The goal of the present study was to examine the influence of the social dimension of friendship on social-cognitive growth following sociocognitive conflict in children. This goal was achieved by assessing children's perceptions of their friends and their nonfriends, and by experimentally manipulating the factor of friendship in a paradigm eliciting a sociocognitive conflict. The results of this study show that in their perceptions, children differentiated their friends from their nonfriends, but that friendship did not influence social-cognitive growth following a sociocognitive conflict.

Children's Perceptions of their Friends and their Nonfriends

One focus of developmental research on friendship is children's differentiation of their friends from their nonfriends. The results of the Friend Perception Task show that children perceive their friends to be more similar to themselves than their nonfriends, and that they prefer their friends as playmates. Together with the results of the Chumship Checklist, which demonstrate a clear differentiation between children's relationships with their friends versus their nonfriends, these results validate the identification of friends and nonfriends using the Friendship Rating Scale. They also replicate previous findings of greater perceived similarity (e.g., Taylor and Singleton, 1983), and preference (Bigelow and LaGaipa, 1975) in friends compared with nonfriends.

The dimension of perceived competence has not been examined in previous studies of friendship. The results of the present study demonstrate that children differentiate their friends from their nonfriends along this dimension. An interesting finding is that children also rated themselves as more competent than their friends. In part, this result is not surprising given the task requirement to choose a favorite school subject: Children were likely to prefer a subject at which they were highly competent. On the other hand, the pattern of rating themselves as more competent supports the notion that children use their

friends as targets for social comparison. Whereas previous research by Berndt (1981a) and Tesser et al. (1984) has suggested that social comparison with friends may operate more in boys, the results of this study support that for relevant activities, in this case a favorite school subject chosen by the children themselves, girls also compare themselves favorably with their friends. The perception of the friend as more competent than nonfriends, but as less competent than the self on relevant dimensions, may serve to boost the child's own self-esteem.

The age difference in ratings of perceived competence, with children in grade 1-2 rating friends, nonfriends, and the self as more competent than children in grade 3-4, is consistent with the conclusion of a recent review by Stipek and MacIver (1989) which documents a decline with age in children's evaluations of their own intellectual competence. Their review suggests that children's concept of ability becomes more differentiated with age, and that the criteria children used to assess intellectual competence shift over the elementary school years, from effort and social reinforcement to objective and normative information. From this perspective, it would be interesting to examine age changes in children's perceptions of competence of themselves and of their friends, by comparing actual competence on a variety of dimension with perceptions of competence of friends, nonfriends, and the self.

It is noteworthy that no age differences were found in children's preferences, nor in their perceptions of similarity and competence of their friends versus their nonfriends. This finding is unexpected given previous reports that conceptions of friendship are consolidated only at the age of 9 years (e.g., Smollar and Youniss, 1982). If this were the case, one would have predicted a stronger differentiation between friends and nonfriends by children in the older age group. In contrast, the results of the present study demonstrate that the differentiation between friends and nonfriends along the dimensions of perceived similarity, preference, and perceived competence is already achieved by 7 to 8 years of age.

Correlational analyses of ratings of perceived similarity, preference, and perceived competence yielded two interesting patterns of results. The correlation of $\underline{r}$ = .59 between preference for friends and perceived self-competence for children in grade 1-2, but not for older children ($\underline{r}$ = .13), supports Sullivan's (1953) hypothesis that a positive affective involvement with a friend and a positive self-image have a mutually enhancing effect. The absence of this relationship in older children suggests, consistent with Stipek and MacIver's (1988) review, that their perceptions of self-competence are based less on positive feelings, an affective dimension, and more on objective evaluative criteria of competence such as grades.

The second pattern of interest concerns children's ratings of perceived competence. For children in grade 1-2, positive correlations between preference for and perceived competence of friends ($\underline{r}$ =.48) and of nonfriends ($\underline{r}$ = .55) indicate that younger children relate liking and perceptions of competence in both friend and nonfriend peers as well as in themselves. In contrast, positive correlations were found for older children's ratings of nonfriends only: for preference and perceived competence ($\underline{r}$ = .46), for preference and perceived similarity ($\underline{r}$ = .52), and for perceived similarity and perceived competence ($\underline{r}$ = .37). For friends at grade 3-4, relationships between the three dimensions were nonsignificant ($\underline{r}$ = .06, $\underline{r}$ = .08, and $\underline{r}$ = .32, respectively, though $\underline{r}$ = .32 did not differ significantly from the corresponding correlation of $\underline{r}$ = .37).

This pattern of correlations supports an affective component to evaluations of competence by younger children, and by older children with respect to nonfriend peers whom they know or like less well. The independence of the dimensions in the ratings of friends by older children suggests that as children grow older, they may gain a more differentiated view of the abilities and characteristics of peers with whom they have an intimate relationship. For children in grade 1-2, the correlations between preference for friends and perceived self-competence, and between

preference and perceived competence of friends, suggest that affective processing is salient for younger children, and reflect its importance for the formation of a positive self-concept.

Friendship as a Social Determinant of Social-Cognitive Growth

The present study hypothesized that perceived similarity along the social dimension of friendship would facilitate regulation of a sociocognitive conflict in the cognitive domain, with the consequence of greater social-cognitive growth. The results fail to support this hypothesis. For the discussed story, there was an interaction effect between grade, level of discusser, and time of testing. The hypothesized interaction effect between friendship group and time of testing, with greater growth at posttest for children who discussed with a friend, was nonsignificant. A breakdown of the three-way interaction showed that at grade 1-2, children did not progress from pretest to posttest, regardless of their initial status in the pair as a high level or a low level discusser. At grade 3-4, children who were low level discussers at pretest gave more mature solutions to the dilemma at posttest, whereas children who were high level discussers at pretest did not change from pretest to posttest. For a small sub-set of the sample, progress made at posttest was shown to be maintained over a five-week

period for low level discussers.

Prior to discussing the results for the discussed story, it is interesting to review the results for the mean score of the three nondiscussed stories. There were three main effects: Children in grade 3-4 scored higher than children in grade 1-2, high level discussers scored higher than low level discussers, and all groups of children scored higher at posttest than at pretest. Higher scores for older than for younger children were expected given the developmental nature of the measure. Higher scores for high level discussers than for low level discussers were most likely a result of the experimental procedure. Since the mean score for the nondiscussed stories included the score for the story which was correlated with the discussed story, then children with higher scores on the discussed story would also have had higher scores on the mean of the nondiscussed stories.

Higher scores at posttest than at pretest for all groups of children are consistent with the finding of Experiment 1 for the Frisbee story. One explanation for the progress from pretest to posttest on the nondiscussed stories is that the effect of the sociocognitive conflict generalized to stimulate thought on the other dilemmas. Studies which have used randomized group designs to address the question of individual versus collective growth (e.g., Doise et al., 1975) would support this interpretation. In

the absence of a significant change from pretest to posttest for all groups of children on the discussed story, however, there is no basis upon which to conclude a generalization effect in the present experiment. An alternative explanation is that when a child is asked by an adult to solve a dilemma, the adult's question stimulates the child's thought. This explanation is consistent with the view expressed by Perret-Clermont and Brossard (1985) that in itself, the pretest situation is an occasion for learning to take place. Moreover, asking the child to solve the dilemma a second time may lead him/her to believe that the first answer was inadequate, thus stimulating him/her to provide other solutions.

In comparison to the results for the nondiscussed stories, it is interesting to look again at the results of the discussed story. Children in grade 1-2 failed to progress from pretest to posttest, whereas at grade 3-4, this effect interacted with level of discusser. Low level discussers in grade 3-4 progressed in their reasoning from pretest to posttest, in contrast to high level discussers who did not change. These findings are inconsistent with reports of progress following a peer interaction (e.g., Doise et al., 1975; 1976), and with reports that both partners progress following a sociocognitive conflict (Doise and Mugny, 1981; Perret-Clermont, 1980).

With regard to younger children, one factor which may

have contributed to their failure to progress following the sociocognitive conflict is that at grades 1 and 2, children do not yet possess the conversational skills that enable them to benefit from a peer discussion, especially with regard to a hypothetical, social-cognitive problem. This interpretation is consistent with the proposal by Forman (1989) that though preadolescent children are capable of adopting complementary roles in order to work together on a common problem (Forman and Cazden, 1985), they lack the ability to engage with peers in collaborative problem-solving tasks that involve academic speech or deductive logic.

From this perspective, a difference in the experimental task would explain the inconsistency of the findings of the present study with past research demonstrating the benefits of peer interaction on cognitive development. All studies which have shown progress following a sociocognitive conflict with children aged 6-7 years (e.g., Ames and Murray, 1982; Doise et al., 1975) have used physical problem-solving tasks, for example conservation of liquid or spatial perspective-taking tasks. In these experiments, the children may discover more mature solutions by confronting each other with their opposing perspectives in a concrete context. In contrast, studies which have shown progress following peer discussions of hypothetical moral or social problems, which are more similar to the task used in the

present study, have used older subjects. Nelson and Aboud (1985) studied children in third and fourth grade, Walker (1982, 1983) studied children aged 9 and 10 years, and the subjects of Turiel (1974) and Haan (1985) were adolescents and young adults. From the perspective of Forman (1989), older children might be more likely to benefit from peer discussions due to their increased ability to share a common academic speech and to collaboratively use deductive inference. Although younger children in the present study discussed the problem with one another, they may have been less able either to listen to one another and/or to integrate the differing and abstract perspectives into a new hypothetical solution. From this perspective, a concrete problem-solving task in which children have the opportunity to benefit from behavioral collaboration (i.e., showing each other the different perspectives) may be more appropriate for younger children.

The results for children in grade 3-4 raise two points of discussion. First, the most likely explanation of the result that high level discussers failed to progress following the sociocognitive conflict is a ceiling effect on the measure. High level discussers in grade 3-4 had less room to progress than low level discussers. Their mean pretest score of 6.58 was close to ceiling (maximum score of 7), although the variance for this group did not differ significantly from the variance of the three other groups.

In contrast to high level discussers, low level discussers increased at posttest to a level equivalent to that of high level discussers at posttest, though not to that of high level discussers at pretest. The obtained result suggests that low level discussers in grade 3-4 benefitted from the peer discussion. From the perspective of Forman (1989), children in grade 3-4 had mastered the cognitive and conversational skills necessary to benefit from an academic discussion of an abstract social-cognitive problem. They may also have better understood the requirements of the task, that is to generate different alternatives prior to deciding upon a common best solution.

Given the failure to find an effect of friendship on the outcome of sociocognitive conflict, qualitative analyses of the audiotaped discussions were undertaken. Friendship group was found to have an effect on the number of conflictual statements made by the pair during the discussion, in that discussions between friends involved more conflict than discussions of other pairs. This finding is consistent with the idea that due to increased feelings of security, friends can withstand some conflict in their interactions. It is also consistent with previous empirical reports of more criticism and honesty in the interactions of friends versus nonfriends (Nelson and Aboud, 1985).

Despite this difference in process, there was no

difference in outcome, which indicates that this variable did not have a strong influence on the outcome of sociocognitive conflict. This suggests that although an initial discrepancy in solutions may be necessary to induce a sociocognitive conflict and promote growth, active disagreement during the discussion may be superfluous. All other differences between groups were nonsignificant, indicating, on the basis of the qualitative variables coded in the present study, that the interactions between pairs of children were essentially similar. It is important to note, however, that because the code was based on variables known to be relevant to friendship, qualities of the discussion relevant to developmental differences along dimensions nonrelevant to friendship (e.g., conversational skills) may have been missed.

The similarity in the process of resolution of sociocognitive conflict is the most likely explanation of the similar outcome of sociocognitive conflict for pairs of friends versus nonfriends. From this perspective, a valid conclusion to this study is that children differentiated their friends from their nonfriends according to play preference, perceived similarity, and perceived competence, but that friendship had no influence on the outcome of sociocognitive conflict. A developmental difference in the outcome of the discussion was that children in grade 1-2 failed to progress from pretest to posttest, where at grade

3-4, low level discussers progressed, demonstrating that they benefitted from the peer discussion. All groups of children progressed from pretest to posttest on the nondiscussed stories. In addition, a small subset of low level discussers maintained their gains in reasoning at followup. Age differences in the outcome of the discussion were attributed to developmental differences in children's capacity to engage in a discussion about a hypothetical, social-cognitive problem. Further research on the process of interaction that is more detailed than the process evaluation conducted in the present study (e.g., videotaped interactions, sequential analyses) would be necessary to support this explanation.

The results of the present study are inconsistent with results reported by Nelson and Aboud (1985) that friends had a more beneficial impact than nonfriends on the outcome of social conflict. Given that third and fourth grade children participated in both studies, and that a similar task and procedure were used to induce the sociocognitive conflict, the difference in results is perplexing. One explanation for the failure to find a difference between friends and nonfriends in the present study may be the familiarity of the nonfriend peers with whom the children interacted. Given that testing was conducted close to the end of the school year, children in the present study had spent one school year as classmates with both friend and nonfriend

peers, in a classroom setting where children are encouraged to listen to and respect the opinions of all peers. In this setting, they may have differentiated less between the opinions of friends and nonfriends than they might have in a less structured environment. Another difference which may partially explain the difference between the results of the present study and that of Nelson and Aboud (1985) is the degree of involvement experienced by the children while working on the experimental task. It is possible that the problems included in the task used by Nelson and Aboud (1985) were more interesting for the children, and thus elicited greater involvement on the part of friend pairs. One way to test this hypothesis would be to compare the process and outcome of pairs of friends versus nonfriends on different types of tasks.

Based on the results of the present study, investigation of the process of interaction between pairs of friends and nonfriends at different ages, and in a variety of experimental and naturalistic contexts, appears to be the most important avenue for future research on the effects of friendship on social-cognitive growth. Observational studies on verbal and nonverbal components of interactions would enrich our understanding of the processes which affect the outcome of sociocognitive conflict, and other forms of influence, between friends and nonfriends.

## General Discussion

The present thesis hypothesized that the social factors of racial group and friendship would influence the outcome of sociocognitive conflict in children, through the mediating influence of perceptions of similarity of their peers. Two experiments examined the influence on social-cognitive growth of the social dimensions of racial group and friendship, along which children have been shown previously to differentiate their peers. The results were consistent with previous research in substantiating that children differentiate their peers along these dimensions. Results failed, however, to demonstrate that either racial group or friendship influenced the outcome of sociocognitive conflict with peers. In Experiment 1, children progressed in their reasoning from pretest to posttest, whether or not they had experienced a sociocognitive conflict with a peer of the same or different race as themselves. In Experiment 2, only grade 3-4 children who had a lower score than their partner at pretest progressed in their reasoning from pretest to posttest, whether or not they experienced a sociocognitive conflict and interaction with a friend or a nonfriend. In summary, in the experimental contexts used in the present studies, children's perceptions of similarity along the dimensions of racial group and friendship did not influence their capacity to learn from children of different social groups.

Based on the results of the present studies, several questions may be raised about the influence of social factors on social-cognitive growth in the context of sociocognitive conflict. First, if racial group and friendship have no influence on outcome, then what other social factors might mediate social-cognitive growth? Second, under what conditions might the social factors of racial group and friendship have an influence on children's social-cognitive development? Third, what effect might the experimental procedures and task have had on the outcome? Finally, what can we conclude on the basis of the present results about the hypothesized relationship between sociocognitive conflict and social-cognitive growth?

The first question addresses the issue of social factors which influence social-cognitive growth in the context of sociocognitive conflict. Although the results of the present studies failed to demonstrate effects on social-cognitive growth of perceived similarity along the dimensions of racial group and friendship, this does not mean that other social factors do not influence social-cognitive growth. Two interesting foci for future research in this area are the concepts of perceived prestige of the partner and children's selectivity of peer informants.

The concept of prestige is based on the observational learning paradigm. It has been shown that that prestige

associated with a model, for example prestige associated with age, is a powerful source of influence for the observer (Bandura, 1969). Edwards and Lewis (1979) found that young children were more likely to choose to obtain information about various social functions from an older peer than from an adult or a same-age peer. Two other social characteristics that may be associated with prestige for children are popularity and socioeconomic status. For example, Hirsch and Renders (1986) showed that children try to make friends with other children more popular than themselves, and Epstein (1983b) reported that children from families of low socioeconomic status name as friends children from families of higher socioeconomic status. It would be interesting to examine the effect of perceptions along these three social dimensions, age, popularity, and socioeconomic status of the partner, on social-cognitive growth in the context of sociocognitive conflict.

Independent of stable social characteristics such as racial group or friendship, it is also possible that children choose peers who are "experts" as sources of learning in a particular domain. Stremmel and Ladd (1984) examined the selective use of others as informants by children in kindergarten, grade 1 and grade 4. They found that when children were requested to make information-seeking decisions on the basis of a peer's gender or age, as opposed to the peer's knowledge of a

specific social or nonsocial task situation, they tended to base their decisions on their beliefs about the peer's knowledge. This finding suggests that perceived expertise of their partner may be another social factor associated with children's social-cognitive growth in the context of sociocognitive conflict.

The finding that children are selective in their use of peer informants leads to the second question, that of the conditions under which racial group and friendship might influence social-cognitive development. If children are selective in their choice of informant for a particular topic area, then the racial group of their peer may have an effect on growth on a race-relevant dilemma. For example, when asked to resolve a dilemma involving racial discrimination, children would be confronted with the race of the peer with whom they are interacting, whom they may perceive as possessing a certain degree of expertise. Differential perceptions of expertise may mediate their response to the different opinions of a same-race versus an other-race peer.

A similar strategy might be used to test the effect of friendship on social-cognitive growth in the context of sociocognitive conflict. Berndt (1988) proposed that two fundamental types of similarity that determine friendship formation are orientation towards school and involvement in children's culture. Similarity in characteristics such as

these may arise because children select friends who are already similar to themselves along these dimensions, but also because they influence each other's attitudes as the friendship develops. It would be interesting to examine the process and outcome of peer interactions with friends versus nonfriends on social-cognitive dilemmas which concern age-appropriate school and leisure activities, for example working on a school project (Ball, 1981), engaging in sports (Medrich, Roizen, Rubin, and Buckley, 1982), or taking drugs (Kandel, 1978b). These topics, which have been shown to be relevant to children's lives, may elicit different patterns and outcomes of sociocognitive conflict resolution between pairs of friends versus nonfriends.

This issue leads to the third question, which involves a critical examination of the task used in the present study. From the perspective that children selectively choose "expert" informants, one explanation for the results of the present studies is that in order to resolve the interpersonal dilemmas of the Interpersonal Problem-Solving measure, a general social perspective-taking task, children had no basis upon which to select as experts one group of peers over another. This measure was selected for use due to its developmental qualities and to its appropriateness for children in the 6- to 10-year age range. The results indicate, however, that it may have been lacked relevance to the specific social dimensions under study. In future

research, it would thus be advisable to use dilemmas which are highly relevant to the social factors which are being investigated.

A related issue to the choice of task is the choice of experimental procedure used to induce the sociocognitive conflict. In Experiment 1, in which the sociocognitive conflict was induced by the adult experimenter, all groups of children improved from pretest to posttest in their reasoning on the social perspective-taking task. In Experiment 2, in which a peer interaction was used to induce the conflict, only grade 3-4 children who had received a lower pretest score than their partner progressed in their reasoning from pretest to posttest. Although we cannot directly compare the results of the two studies, we can use the information gained from both studies to suggest improvements for future work.

In Experiment 1, attribution of children's progress at posttest to the sociocognitive conflict is complicated by the confounding effect of the presence of the adult experimenter. Through conformity, the presence of the adult perhaps overpowered any potential effect of the social factor of race. Past research within the theoretical frameworks of social interaction and cognitive development (Mugny et al., 1984) and of observational learning (Bandura and Kupers, 1964; Jakubczak and Walters, 1959; Robert and Charbonneau, 1977) demonstrate that adult models have a

conforming effect on children's behavior. Moreover, two studies have shown that children copy an adult's behaviour only when the adult is present (Peterson and Whitehurst, 1971), and that they return to their previous response once the model has left (Oliver and Hoppe, 1974). If children in the present study assumed that the alternative answer which was attributed to the same-race or the other-race child was the right answer in the opinion of the experimenter, then their progress at posttest may have been the result of conformity. If children changed their answer due to conformity, then as shown in previous studies, one would predict that the change would not be maintained at followup. This prediction was supported by the rough followup measure in Experiment 1, and might be further tested in future research. If one is interested in the effect of peers on social-cognitive growth, however, then it would be advisable to present the opinion directly from a peer, either through a peer interaction or using a video-taped presentation of the peer's differing opinion. Another strategy might be to present children with two differing opinions, each of which is attributed to a peer belonging to the same or different social group, and to measure the direction in which the child's opinion is swayed.

In Experiment 2, a peer interaction was used to induce the sociocognitive conflict. This procedure had two advantages over conflict induction using an adult

experimenter: it was unconfounded with the effect of the adult experimenter, and it permitted the investigation of process variables which may have been related to outcome. Despite the absence of group differences in outcome due to friendship, which are perhaps due to the choice of task, this procedure revealed a developmental difference in the outcome of the peer discussion. The finding that younger children failed to benefit from the peer discussion suggests that in order to facilitate children's growth, and thus the experimental assessment of differential responses related to social factors, future studies might include concrete tasks on which children may act out their different opinions, rather than express them verbally. One might either use standard Piagetian tasks, or translate social-cognitive dilemmas into a concrete form by using doll enactment. It would also be advisable to videotape the children's interactions to allow for a richer observation of process variables.

Finally, it is important to address the issue of the role of sociocognitive conflict in promoting social-cognitive growth. In the present thesis, children progressed in reasoning from pretest to posttest on dilemmas for which no sociocognitive conflict had been induced: the Frisbee dilemma in Experiment 1, and the mean score of the three nondiscussed dilemmas in Experiment 2. Many studies have demonstrated that interactions between peers provide a

favorable context for cognitive and social-cognitive growth to occur. Consistent with the suggestion by Perret-Clermont and Brossard (1985), however, it appears that children may also benefit from simply being confronted with a problem to solve, for example at pretest or following being asked to solve a dilemma twice. From this perspective, it is possible that a functional mechanism for stimulating learning is cognitive disequilibrium and restructuring, and that this functional mechanism may be stimulated in other ways than through peer sociocognitive conflict. For example, observation of a model whom the child perceives as an "expert" may provide sufficient impetus for cognitive disequilibrium and restructuring, as may the provision of feed-back indicating that one's opinion is inadequate. In the present studies, the experimenter asking a second time for the child's solution may have led the child to believe that s/he was wrong the first time, which may have led to a cognitive disequilibrium. From this perspective, it is important to include a follow-up assessment, in order to evaluate the long-term effects of various methods of stimulating learning. That is, maintenance of progress at follow-up would provide a measure of the degree to which the progress at posttest was internalized.

The goal of the present thesis was to elaborate on the social conditions which provide for optimal learning by children with their peers. Racial group and friendship were

hypothesized to be two social factors which would influence social-cognitive growth through the mediating effect of perceived similarity. The results were that children differentiated between their peers along the dimensions of racial group and friendship, but that these social factors did not influence the outcome of a sociocognitive conflict. Experimental and theoretical issues raised by the results of the two studies include the relevance of the chosen dimensions for influencing social-cognitive growth, the characteristics of the task and procedures used to induce the sociocognitive conflict, and the hypothesis that sociocognitive conflict is but one way to elicit cognitive disequilibrium and restructuring which leads to social-cognitive growth. Several interesting directions for future research are the influence of perceptions of prestige and expertise of the partner on social-cognitive growth in the context of sociocognitive conflict, and the use of tasks which are directly related to the social factor under study. The investigation of different experimental procedures for inducing a cognitive disequilibrium, for example sociocognitive conflicts with peers of different social groups, and observation of peer models of different social groups, may also contribute to our understanding of the processes of learning in the context of social interaction with peers.

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# Appendix A

## Parent Letters for Experiment 1

Appendix A - 1. Parental Consent Letter for Experiment 1

Montréal, le 14 octobre, 1986

Chers parents,

Nous aimerions savoir si vous consentiriez à ce que votre enfant participe, à l'école, à un projet de recherche sur le développement de l'enfant. Notre étude a été approuvée par la CECM et le Comité de l'ecole, et est subventionnée par les Fonds pour la formation des chercheurs et l'aide à la recherche du Québec. Le projet concerne la capacité des enfants à développer de nouvelles solutions aux problèmes interpersonnels, grâce aux idées provenant d'enfants d'origine ethnique identique ou différente. Nous croyons que notre étude contribuera aux démarches pour l'intégration sociale des enfants de différents groupes ethniques.

Nous aimerions demander à votre enfant de participer, au cours des trois prochains mois, à deux séances de 20 à 25 minutes, durant les heures d'école. Pendant ces séances, un membre de notre équipe de recherche montrera à votre enfant des photos d'enfants inconnus de diverses ethnies, et lui demandera d'indiquer à quel point il/elle pense que les enfants lui ressemblent au niveau des préférences pour diverses activités telles que l'école et les sports. On lui demandera aussi son avis concernant deux problèmes interpersonnels, par exemple: est-ce qu'un enfant devrait monter dans un arbre pour sauver un chaton, alors qu'il a promis à son père qu'il ne grimperait pas dans les arbres. Nous croyons que l'expérience sera enrichissante pour votre enfant, dans la mesure où l'on discutera avec lui/elle des solutions alternatives aux problèmes interpersonnels. Les enfants trouvent généralement ces activités fort intéressantes et aucun enfant n'est jamais forcé d'y participer.

Un résumé plus détaillé de notre projet est disponible au secrétariat de l'école. Si vous désirez plus de renseignements, vous pouvez communiquer avec Rosemary Feltham au 848-7560 (le jour).

Veuillez, s'il vous plaît, indiquer sur le formulaire ci-joint si vous consentez ou non à la participation de votre enfant. Si vous consentez, veuillez s'il vous plaît remplir aussi les questions additionnelles. Nous apprécierons que vous nous retourniez le formulaire aussitôt que possible, dans l'enveloppe pré-adressée. Les renseignements receullis seront utilisés dans le cadre du projet par l'équipe de recherche seulement. Lorsque l'étude sera terminée, nous serons heureuses de vous faire parvenir un bref résumé des résultats de notre projet.

Nous vous remercions beaucoup,

| | |
|---|---|
| Rosemary Feltham, M.A. | Anna-Beth Doyle, Ph.D. |
| Coordinatrice du projet | Professeur agrégé |

Octobre, 1986

FORMULAIRE DE PARTICIPATION

Nom de l'enfant _____ Classe _____
ECOLE

J'accepte ____ Je n'accepte pas ____ que mon enfant participe au projet de recherche de Mme. Doyle à l'école de mon enfant.

Nom du parent ou tuteur _____
Tel.: _____

Signature _____

---

SI VOUS ACCEPTEZ QUE VOTRE ENFANT PARTICIPE AU PROJET, VEUILLEZ FOURNIR LES RENSEIGNEMENTS CI-DESSOUS:

Date de naissance de l'enfant _____

Quelle(s) langue(s) votre enfant parle-t-il à la maison?
Français _____ Anglais _____
Autre (Nommer s.v.p.) _____

Qui vit à la maison avec votre enfant?
le père ____ la mère ____ frère(s) ____ soeur(s) ____
autre(s) adulte(s) ____ (veuillez indiquer leur(s) lien(s) avec l'enfant. Par exemple: oncle, tante, ami(e), etc.
_____

Quel genre de travail fait la mère? _____

_____

Si la mère ne travail pas en ce moment à l'extérieur de la maison, quel était son dernier emploi? _____

_____

Dans quel genre de compagnie ou industrie travaille ou travaillait la mère?

_____

Quelles sont ou étaient les activités ou responsabilités de la mere au travail? (par exemple: vendre des autos, opérer des machines)

_____

Quel genre de travail fait le père? _____

_____

Si le père ne travaille pas en ce moment à l'extérieur de la maison, quel était son dernier emploi? _____

_____

Dans quel genre de compagnie ou industrie travaille ou travaillait le père?

_____

Quelles sont ou étaient les activités ou responsabilités du père au travail? (par exemple: vendre des autos, opérer des machines)

_____

Scolarité de la mère (niveau le plus élévé atteint ou diplôme obtenu):

Ecole primaire _____ Ecole secondaire _____ CEGEP _____
Université: Bacc. ____ Maîtrise ____ Doctorat ____

Scolarite du père (niveau le plus élévé atteint ou diplôme obtenu):

Ecole primaire _____ Ecole secondaire _____ CEGEP _____
Université: Bacc. ____ Maîtrise ____ Doctorat ____

SI VOUS DESIREZ RECEVOIR UN RAPPORT DU PROJET, INSCRIVEZ VOTRE ADRESSE, S.V.P.:

_____

_____

Appendix A - 2. Followup Letter Sent to Parents

Montréal, le 9 mars, 1987

Chers parents,

Au mois d'octobre 1986, nous vous avons demandé votre consentement à ce que votre enfant participe à un projet de recherche sur le développement de l'enfant. Nous vous remercions d'avoir donné votre permission, et nous aimerions vous informer que le projet avance bien. Un membre de notre équipe a eu le plaisir de rencontrer votre enfant et de discuter de ses idées à propos des dilemmes interpersonnels. Nous sommes maintenant en train d'analyser les informations recueillies, et nous vous enverrons un résumé des resultats lorsque les analyses seront complétées.

Nous vous écrivons maintenant pour demander votre participation à l'étape finale du projet. Maintenant que plusieurs semaines se sont écoulees apres notre rencontre avec votre enfant, nous aimerions de nouveau connaître ses idées à propos d'un dilemme interpersonnel. Pour cela, nous vous demandons un petit service. Pourriez-vous, s'il vous plaît, lire à votre enfant la courte histoire que vous trouverez ci-jointe, noter sur la feuille sa reponse a une seule question, et nous renvoyer la feuille dans l'enveloppe fournie? Ceci ne prendra que cinq minutes de votre temps, et en plus de nous aider, l'histoire vous donnera une idee du genre de dilemme dont on a discuté avec votre enfant.

En faisant cette tâche, il est très important que vous écriviez la réponse de votre enfant sans la discuter. Les enfants donnent une variété de réponses face aux dilemmes comme celui que vous allez lui lire, et nous voulons simplement savoir qu'est-ce qu'il ou elle a repondu. Autrement dit, toutes les réponses sont bonnes. Apres que vous avez complété la questionnaire, vous pouvez bien sûr discuter du dilemme avec votre enfant.

Si vous avez des questions à nous poser, s'il vous plaît n'hésitez pas à appeler Rosemary Feltham au 848-2257 ou 848-7560 (le jour). Nous vous souhaitons du plaisir avec votre enfant et nous vous remercions encore une fois de votre cooperation.

Rosemary Feltham, M.A.
Coordinatrice du projet

Anna-Beth Doyle, Ph.D.
Professeure agrégée

Nom de l'enfant _____

Ecole _____ Classe _____

Date _____

Marie est un enfant qui joue avec trois autres enfants à la maison. Son père arrive avec, comme surprise, des billets pour aller au cirque samedi après-midi. Il y a 5 billets: 2 pour sa mère et son père, 1 pour Marie, et 2 pour les autres enfants. Il y a un problème parce que Marie ne peut pas emmener tous les enfants, et on ne peut pas acheter un autre billet. Sophie fête son anniversaire, et Marie lui avait promis de l'emmener en un endroit spécial. Johanne vient d'une famille qui n'a pas beaucoup d'argent, et n'a pas souvent l'occasion de faire de belles sorties. Thérèse vient de démenager dans le quartier. Elle veut rencontrer d'autres enfants, et la semaine dernière, Marie a été invitée au cinéma par la famille de Thérèse.

Faisons semblant que tu es Marie. Quelle serait la meilleure façon de régler ce problème? Pourquoi?

(Rappelez-vous qu'on ne peut pas acheter un autre billet; il n'en reste plus.)

Réponse de l'enfant: _____

_____

_____

Pourquoi?: _____

_____

_____

La personne remplissant le formulaire:

mère _____ père _____
autre (spécifiez s.v.p.) _____

Retournez à: A.B. Doyle, ER-100
Département de psychologie
Université Concordia
1455 boul. de Maisonneuve ouest
Montréal, Québec H3G 1M8

MERCI BEAUCOUP !!!

Nom de l'enfant _____

Ecole _____ Classe _____

Date: _____

Paul est un enfant qui joue avec trois autres enfants à la maison. Son père arrive avec, comme surprise, des billets pour aller au cirque samedi après- midi. Il y a 5 billets: 2 pour sa mère et son père, 1 pour Paul, et 2 pour les autres enfants. Il y a un problème parce que Paul ne peut pas emmener tous les enfants, et on ne peut pas acheter un autre billet. Jean fête son anniversaire, et Paul lui avait promis de l'emmener en un endroit spécial. Robert vient d'une famille qui n'a pas beaucoup d'argent, et n'a pas souvent l'occasion de faire de belles sorties. Stéfane vient de démenager dans le quartier. Il veut rencontrer d'autres enfants, et la semaine dernière, Paul a été invite(e) au cinéma par la famille de Stéfane.

Faisons semblant que tu es Paul. Quelle serait la meilleure facon de régler ce problème? Pourquoi?

(Rappelez-vous qu'on ne peut pas acheter un autre billet; il n'en reste plus.)

Réponse de l'enfant: _____

_____

_____

Pourquoi?: _____

_____

_____

La personne remplissant le formulaire:

mère _____ père _____
autre (spécifiez s.v.p.) _____

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MERCI BEAUCOUP !!!

# Appendix B

## Measures Used in Experiment 1

Appendix B - 1. Instructions for Race Perception Task

## RACE PERCEPTION TASK

### Marche à suivre

Pour chaque question, utilisez des photos d'enfants du même sexe, et d'âge et de race identiques ou différents du sujet (six photos au total). Utilisez le dessin du même sexe et de la même race pour représenter le sujet et demandez-lui de placer ce dessin sur l'échelle en même temps que les photos des autres enfants.

### 1. Identification de la race

Placez toutes les photos devant l'enfant en formant un demi-cercle et dans l'ordre suivant, en commencant par la gauche: Noir, Blanc, Noir, Blanc, Noir, Blanc. En montrant toutes les photos à l'enfant, dites: Voici six photos d'enfants, dont quelques uns sont noirs/blancs et d'autres sont blancs/noirs (dites la race de l'enfant en premier). Indiquez un des enfants de la même race que le sujet et dites: Cet enfant est noir/blanc, es-tu noir/blanc? Ensuite, indiquez un des enfants de l'autre race et dites: Cet enfant est blanc/noir, es-tu blanc/noir? Si l'enfant s'identifie correctement ("oui" à la bonne race et "non" a l'autre), continuez avec la prochaine question. Si l'enfant répond "non" aux deux questions, demandez: Qu'est-ce que tu es? et si sa réponse emploit un terme correcte pour identifier sa race, employez son terme. Si l'enfant s'identifie incorrectement ("oui" a la race incorrecte et "non" à la race correcte), discutez avec lui pour voir s'il change d'avis. S'il persiste à mal s'identifier, terminez la première session, et ne pas faire la deuxieme. (Dans ces cas, on ne peut pas utiliser ses réponses).

### 2. Similitudes et Différences

(a) Placez l'échelle de similitudes et différences verticalement devant l'enfant, avec 1 près de lui/elle. Dites: Voici mon jeu de similitudes et différences. C'est un jeu où l'on dit si les choses sont pareilles ou différentes. Nous utiliserons cette échelle-ci. Si les choses que je te montre se ressemblent beaucoup, nous les placerons proche l'une de l'autre, et si les choses sont différentes, on va les placer loin l'une de l'autre. D'accord? Es-tu prêt? Nous allons commencer par te montrer

comment le jeu fonctionne. Placez les photos de la pomme, de la banane, et les loups sur la table. Présentez a l'enfant des pairs de photos dans l'ordre suivant: Loup1 - Loup2; Pomme - Loup1; Pomme - Banane. Pour chaque paire de photos, dites: Places les photos tres proches si elles se ressemblent beaucoup, un peu proches si elles se ressemblent un petit peu, et places-les loin si elles sont differentes l'une de l'autre. D'accord? Avant de procéder, assurez-vous que l'enfant comprenne le principe de representer des similarités et des differences par la distance sur l'échelle. Si l'enfant n'emploie que les extremites de l'echelle, alors prenez les deux loups et dites: Ces choses sont un peu differentes, mais pas beaucoup différentes, alors on les met ici (placez les photos a environ 1 et 4). O.K.? Ensuite, repetez la presentation des photos d'entraînement.

(b) Gardez l'echelle dans sa position verticale (1 près du sujet) et placez les photos dans un demi-cercle à côte de l'echelle et dans l'ordre suivant: Noir1, Blanc1, Noir2, Blanc2, Noir3, Blanc3. Dites: Maintenant on va jouer notre jeu de similitudes et differences avec ces photos d'enfants. Places les photos tres proches de toi si elles te ressemblent beaucoup, un peu proches si elles te ressemblent un petit peu, et place-les loin si elles sont differentes de toi. Presentez les photos à l'enfant dans l'ordre suivant: Noir1, Blanc1, Noir2, Blanc2, Noir3, Blanc3. Après que l'enfant ait place toutes les photos, choisissez l'enfant de la même race que le sujet a placé le plus proche de lui-même, et choisissez l'enfant de l'autre race que le sujet a placé le plus loin de lui-même, et pour chacun, demandez: En quoi cet enfant te ressemble-t-il/elle? et Quelles sont les differences entre toi et cet enfant?

3. Perception de similitude de compétence

Gardez l'echelle verticalement et dites: Maintenant nous allons faire un jeu ou l'on dit si les gens sont bons ou moins bons en quelque chose. Pres de toi, c'est pour dire qu'on est très bon et loin de toi, c'est pour dire qu'on n'est pas bon du tout, et au milieu, c'est pour dire qu'on est assez bon. D'accord? Maintenant, quel est ton sujet prefere a l'ecole? Après avoir eu la reponse de l'enfant, placez les 7 photos dans un demi-cercle sur la table a côté de l'echelle et dans l'ordre suivant: Soi-même, Noir1, Blanc1, Noir2, Blanc2, Noir3, Blanc3. Dites: Voici des photos de toi et d'autres enfants. Places les photos ici sur l'échelle pour me montrer à quel point ils sont bons en _____ (sujet prefere de l'enfant). Si l'enfant est bon, places-le ici (indiquez l'extremité de l'échelle près de l'enfant), s'il est assez bon, places-le ici (indiquez le milieu de l'échelle) et si l'enfant n'est pas bon, places-le

ici (indiquez l'extrémité de l'échelle loin de l'enfant). On va commencer avec toi-même. Après que l'enfant ait place la photo qui le représente, demandez-lui de placer chacune des autres photos.

4. Préférence de compagnon de jeu

Gardez l'échelle verticalement. Dites: Maintenant, on va faire un jeu où on dit à quel point on aime jouer avec quelqu'un. Si tu aimes beaucoup jouer avec la personne, tu places la photo près de toi, si tu aimes jouer avec la personne un petit peu, tu places la photo au milieu, et si tu n'aimes pas jouer avec la personne, tu places la photo plus loin. D'accord? Placez les six photos des enfants dans un demi-cercle sur la table à côte de l'echelle et dans l'ordre suivant: Noir1, Blanc1, Noir2, Blanc2, Noir3, Blanc3. Maintenant, je veux savoir si tu aimerais jouer avec cet enfant ici. Places sa photo sur l'echelle pour me montrer à quel point tu aimerais jouer avec lui/elle. Si tu aimerais beaucoup jouer avec l'enfant, places sa photo près de toi-même, si tu aimerais un peu jouer avec l'enfant, places sa photo au milieu, et si tu n'aimerais pas jouer avec l'enfant, places sa photo loin de toi. D'accord? Répétez pour chaque photo.

Appendix B - 2. Race Perception Task Response Form

RACE PERCEPTION TASK - RESPONSE FORM

Name: _____ Date: _____
School: _____ Age: ___ Grade: ___ Sex: ___ Race: ___

1. Identification de Race

Cet enfant est Noir. Es-tu Noir? Oui ____ Non ____
Cet enfant est Blanc. Es-tu Blanc? Oui ____ Non ____
Si l'enfant répond non aux deux questions, demandez:
Qu'est-ce que tu es? _____

2. Perceived Similarity

(a) Entraînement
Loup 1 _____ Loup 2 _____
Pomme _____ Loup1 _____
Pomme _____ Banane _____

(b) (i) Soi-même: _____ Noir1: _____

PAREIL - _____

_____

DIFFERENT - _____

_____

(ii) Soi-même: _____ Blanc1: _____

PAREIL - _____

_____

DIFFERENT - _____

_____

(iii) Soi-même: _____ Noir2: _____

PAREIL - _____

_____

DIFFERENT - _____

_____

(iv) Soi-même: _____ Blanc2: _____

PAREIL - _____

_____

DIFFERENT - _____

_____

(v) Soi-même: _____ Noir3: _____

PAREIL - _____

_____

DIFFERENT - _____

_____

(vi) Soi-même: _____ Blanc3: _____

PAREIL - _____

_____

DIFFERENT - _____

_____

3. Perception de compétence

(a) Sujet préféré: _____

Soi-même _____

Noir 1 _____ Noir 2 _____ Noir 3 _____

Blanc1 _____ Blanc2 _____ Blanc3 _____

4. Préférence de Compagnon de Jeu

(b) Noir 1 _____ Noir 2 _____ Noir 3 _____

Blanc1 _____ Blanc2 _____ Blanc3 _____

Appendix B - 3. Interpersonal Problem-Solving Measure for Experiment 1

INTERPERSONAL PROBLEM-SOLVING MEASURE

Nom _____ Classe _____ Date _____

Pré-test ____ Post-test ____
Reponse alternative: Même ____ Autre ____

André/Anne est celui/celle qui est responsable lorsque sa mere est sortie. Il/elle garde son/sa plus jeune frere/soeur, David/Sara, pendant que leur mère est absente. Avant son départ, leur mère a rappelé a André/Anne de ne pas laisser David/Sara jouer avec le frisbee qu'il/elle venait d'apporter dans la maison. Pendant l'absence de leur mère, un/e ami/e de David/Sara, Pierre/Jocelyne, leur rend visite. Lors de sa visite, Pierre/Jocelyne trouve le frisbee et le lance d'un bout à l'autre du salon. Le frisbee frappe une plante qui est placee sur le seuil de la fenêtre, et la fait tomber. En tombant, la plante frappe une lampe, et la brise. Au même moment, la mere arrive à la maison. Maintenant, un problème se pose.

1. Faisons semblant que tu es André/Anne. Qui devrait nettoyer le dégat et payer pour la lampe? (Est-ce qu'il y a d'autres façons de régler le problème?)

2. Qu'est-ce que tu penses qui arrivera si (liisez chaque solution de 2.)? (Quelles autres choses pourraient se passer?)

3. Selon toi, qu'est-ce qui serait la meilleure façon de regler ce problème? Pourquoi? (Assurez-vous que l'enfant choisisse <u>une</u> solution qu'il considère la meilleure.)

Nom _____ Classe _____ Date _____

Pré-test _____ Post-test _____
Réponse alternative: Même ____ Autre ____
Niveau donné: _____

Marie/Paul est un enfant qui joue avec trois autres enfants à la maison. Son père arrive avec, comme surprise, des billets pour aller au cirque samedi après-midi. Il y a 5 billets: 2 pour sa mère et son père, 1 pour Marie/Paul, et 2 pour les autres enfants. Il y a un problème: Marie/Paul ne peut pas emmener tous les enfants, et on ne peut pas acheter un autre billet. Sophie/Jean fête son anniversaire, et Marie/Paul avait promis de l'emmener à un endroit spécial. Johanne/Robert vient d'une famille qui n'a pas beaucoup d'argent, et n'a pas souvent l'occasion de faire de belles sorties. Thérèse/Stéfan vient de demenager dans le quartier. Il/elle veut rencontrer d'autres enfants, et la semaine dernière, Marie/Paul a été invité(e) au cinéma par la famille de Thérèse/Stéfan.

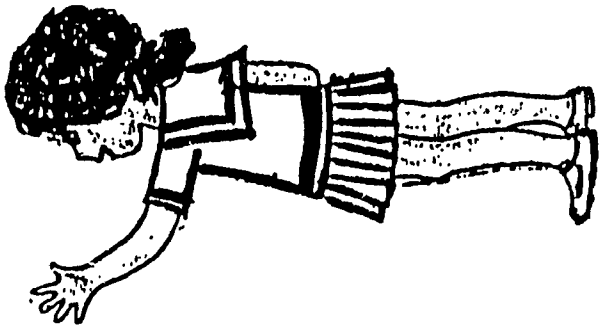
1. Faisons semblant que tu es Marie/Paul. Que ferais-tu pour régler ce problème? ( Y a-t-il d'autres façons?)

2. Qu'est-ce que tu penses qui va arriver si (lisez chaque solution de 2.)? (Quelles autres choses pourraient se passer?)

3. Selon toi, qu'est-ce qui serait la meilleure façon de régler ce problème? Pourquoi? (Assurez-vous que l'enfant choisisse une solution comme la meilleure.)

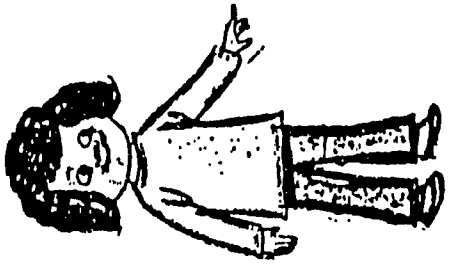
4. Recall: Oui ____ Non ____ Si oui, alors écrivez la réponse

Appendix B Illustration Accompanying Interpersonal Problem-Solving Measure: Circus Story



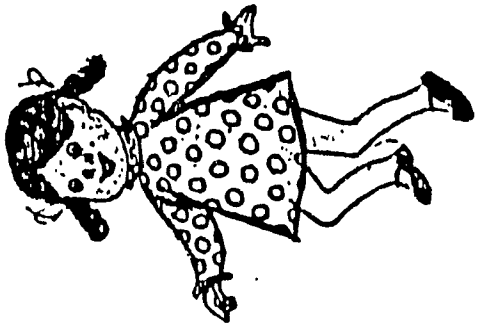
Marie

Cirque



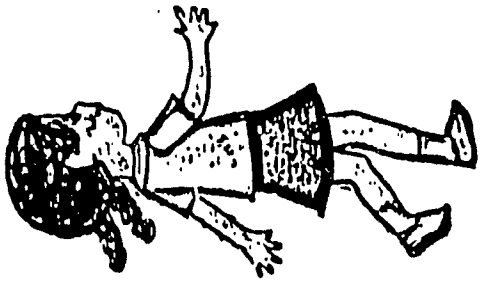
Thérèse

Nouvelle



Johanne

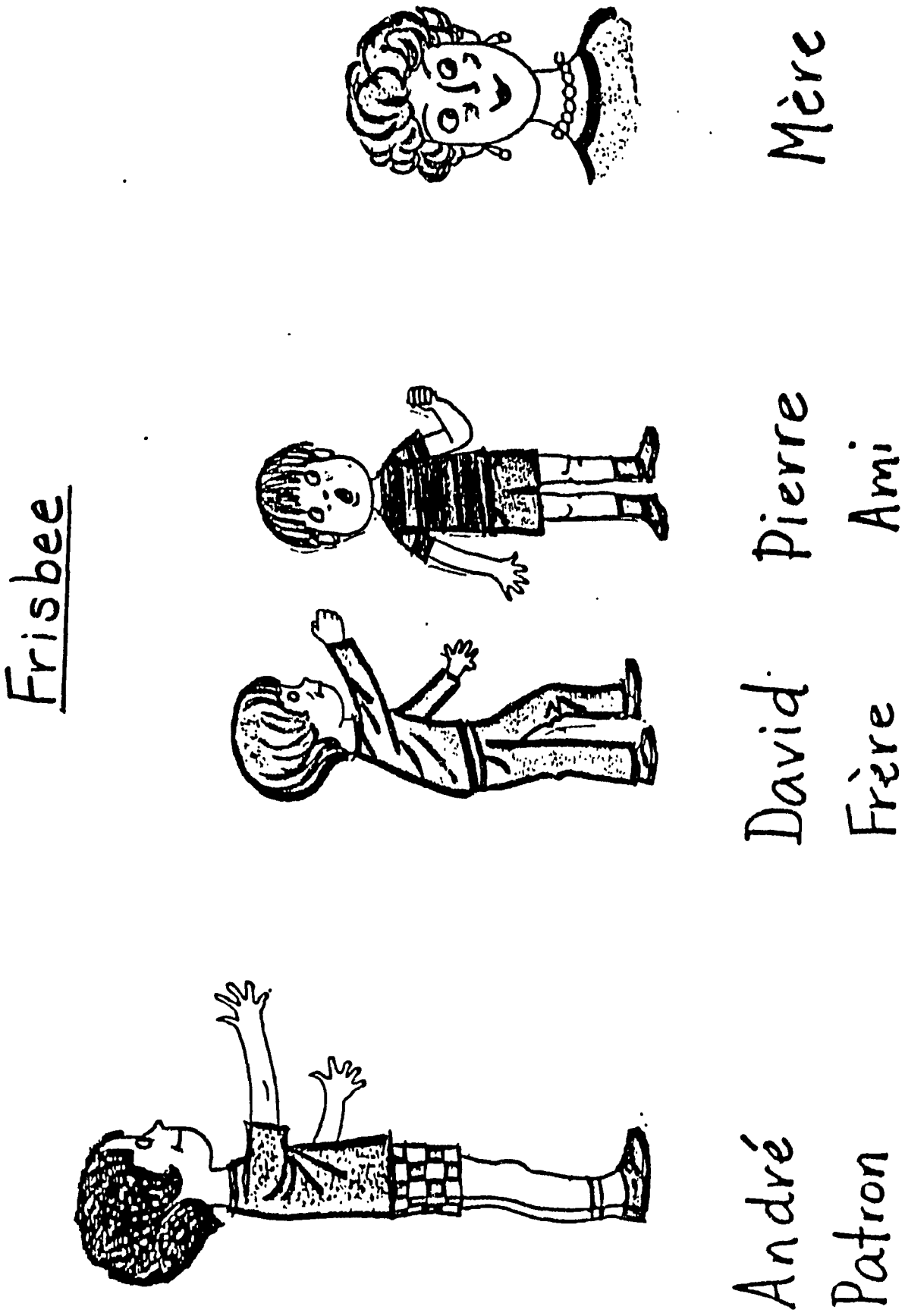
Pauvre



Sophie

Fête

Appendix B Illustration Accompanying Interpersonal Problem-Solving Measure: Frisbee Story



Appendix B - 4. Scoring Criteria for Interpersonal Problem-Solving Measure According to Marsh (1982)

IPS SCORING ACCORDING TO MARSH (1982)

CIRCUS DILEMMA

| Level | Description |
|---|---|
| 0 | Failure to deal with problem |

e.g., Nobody goes (no attempt to explain why).
Parents go alone.
Buy more tickets.
Father would be working.

| | |
|---|---|
| 1 | Less than 3 children go; no attempt to satisfy others |

e.g., Take only Wendy.

| | |
|---|---|
| 2 | Three children go; one child left out involuntarily; no attempt made to satisfy left out child. |

e.g., Take Jenny and Wendy because you like them best.

| | |
|---|---|
| 3 | Three children go; attempt to compensate left out child<br>or<br>Any solution in which someone is left out but an attempt is made to consider feelings of all |

e.g., Sell tickets so friends' feelings won't be hurt.
Go with cousins instead; no one will be mad.
Take Jenny and Wendy and explain to Susan. She will understand because she is best friend.
Ask parents for advice; they may be able to solve without hurting friends' feelings.
One parent may volunteer to stay home so all children can go.
Nobody goes because you don't want to hurt anyone's feelings. (This is a 0 answer without reference to feelings.)

4 Decision agreed upon by all and all are satisfied to some extent.

e.g., Decide to donate tickets to charity and have a party instead.
Sell tickets; use money to go somewhere else.
Friends talk it over and decide together what to do.
Draw names out of a hat.

Spoiled answers: -1 (subtract 1 point)

e.g., Debbie stay home and friends go. 3 - 1 = 2
(Feelings of all are considered but unrealistic for parents to only take friends.)
Go to a movie instead. You can get popcorn. 4 - 1 = 3
(This is a 4 answer but the reason is irrelevant.)

FRISBEE DILEMMA

| Level | Description |
|---|---|

0 Failure to deal with problem

e.g., Nobody does it.
Go to a movie.

1 No attempt to assign responsibility; mother does it alone.

e.g., Mother clean up and pay for lamp so father doesn't yell.
Pete's dad should clean up and his mother should pay.

2 Only one child or child and mother; other children not mentionned.

e.g., Pete should pay and clean up because he threw frisbee.
Mother should pay for lamp because she has most money;
Andy should clean up mess because he let kids touch the frisbee.
Jean and her mother should clean up and pay.

3 Two children share responsibility; third child not mentionned.

e.g., Dave clean up mess and Pete pay because it's Dave's house and Pete broke lamp.
Andy pay and Pete clean up because Pete did it and Andy wasn't watching.

4 All children reflected in solution; all share responsibility in some way.

e.g., Everyone should help pay for it and clean up. All were involved.
Barb and Joan clean up and pay with Sally helping.
Andy and Pete pay and clean up because Andy was boss and Pete did it. Dave doesn't have to help because it is not his fault. (All children are reflected in solution; Dave's exclusion from responsibility is reasonable.)

Spoiled answers: -1 (subtract 1 point)

e.g., Sally and Joan clean. Sally's mother would pay. 3 - 1 = 1 (Including mother lowers score.)
All clean up and each family pay. 4 - 1 = 3 (Family should not pay.)

Note: Mother may be included in a 3 or 4 answer without getting -1 if the children accept the responsibility and she is only helping.

e.g., Andy, Dave, and Pete all chip in and if not enough money, mother will add the rest. (4 points.)
The three kids clean. Joan and her parents pay. (4 points.)

Appendix B - 5. Revised Scoring by Author of Interpersonal Problem-Solving Measure

REVISED IPS SCORING

CIRCUS DILEMMA - DIVISION OF LIMITED RESOURCES

| Level | Description |
|---|---|
| 0 | Avoidance of dilemma |

e.g., Buy more tickets - even though reminded once that no more available.

| | |
|---|---|
| 1 | Recognition of situation but failure to fully recognize dilemma - Use one of remaining tickets and choose one child |

e.g., Parents and child go with one other child

| | |
|---|---|
| 2 | Recognition of situation but failure to fully recognize dilemma - Use both of remaining tickets and choose two children |

e.g., Parents and child go with two other friends

| | |
|---|---|
| 3 | Recognition of dilemma in terms of feelings of excluded persons but unable to generate alternative solution |

e.g., No one goes to avoid hurt feelings, argument, etc. but no alternative solution given. Variations on this theme are that parents go alone or that parents and child go alone with child but no friends.

| | |
|---|---|
| 4 | Recognition of dilemma in terms of feelings and makes effort at generating an alternative solution, although it is impractical |

e.g., One parent stays (for any reason) and the other parent goes with the children OR The child stays and the parents go with the friends OR The parents stay and the children go alone.

5 Recognition of dilemma and more successful alternative solution at satisfying feelings of all

e.g., Parents and child go with two other children and attempt made to satisfy the left-out child OR Parents and child go with one other child and attempt made to satisfy the two left-out children.

6 Recognition of dilemma and successful alternative made at satisfying all children equally; however, decision is unilateral

e.g., Donate or sell tickets and have a party instead with everyone involved.

7 Recognition of dilemma and alternative made at satisfying all children equally; however, decision is mutual, or agreed upon by all

e.g., Talk together with all the children and decide what to do, be it pulling names out of a hat, or selling tickets and having a party instead.

FRISBEE DILEMMA - ATTRIBUTION OF RESPONSIBILITY

Level Description

0 Avoidance of dilemma

e.g., Do nothing

1 Complete transfer of responsibility to authority

e.g., Parent(s) clean up and pay alone

2 Shared responsibility between one child and parent

e.g., One child and parent clean up and pay

3 Complete responsibility by one child only

4 More children involved - Shared responsibility among two children and parent(s)

5 Complete responsibility by two children only

6 All children involved - Shared responsibility among three children and parent(s)

7 Complete responsibility by all children involved

Appendix B - 6. Alternative Answers given to Subjects in Experiment 1

## Alternative Answers for Interpersonal Problem-Solving Task

CIRCUS PROBLEM

Level 1 - Less than three children go (i.e., Sophie/Paul and one other); no attempt to satisfy others.

"Cet enfant a dit qu'il/elle emmènerait seulement Thérèse/Stéfan. Il/elle a dit qu'il/elle choisirait Therese/Stéfan parce que Thérese/Stéfan est nouvelle/nouveau dans le quartier, et de plus, sa famille l'avait invité au cinéma la semaine dernière. Alors il/elle a dit qu'il/elle emmenerait Thérèse/Stéfan.

Level 2 - Three children go (i.e., Sophie/Paul and two others); one child left out involuntarily; no attempt made to satisfy left out child.

"Cet enfant a dit qu'il/elle emmènerait Sophie/Jean et Thérèse/Stéfan. Il/elle emmènerait Sophie/Jean parce que c'est sa fête, et qu'il/elle emmènerait Thérese/Stéfan parce que la famille de Thérese/Stéfan l'avait emmené au cinéma la semaine derniere. Alors il/elle a dit qu'il/elle emmènerait Sophie/Jean et Thérese/Stéfan.

Level 3 - Three children go (i.e., Sophie/Paul and two others); attempt to compensate left out child

or

Any solution in which someone is left out but an attempt is made to consider feelings of all.

"Cet enfant a dit qu'il/elle emmènerait Sophie/Jean et Johanne/Robert, mais qu'il/elle expliquerait a Thérèse/Stéfan qu'il/elle l'emmènerait à un endroit spécial une autre fois. Il/elle a dit qu'il/elle emmenerait Sophie/Jean parce qu'il/elle lui avait promis de l'emmener à un endroit special pour sa fête, et qu'il/elle emmènerait Johanne/Robert parce qu'il/elle ne fait pas souvent de belles sorties. Alors, il/elle a dit qu'il/elle emmènerait Sophie/Jean et Johanne/Robert, et qu'il/elle expliquerait à Thérèse/Stéfan qu'il/elle l'inviterait la prochaine fois.

Level 4 - Decision agreed upon by all and all are satisfied to some extent.

"Cet enfant a dit qu'il/elle discuterait avec tous les enfants, et ensemble ils décideraient de vendre tous les billets de cirque et de faire une partie à la place.

Il/elle a dit que c'est la meilleure chose à faire parce qu'ainsi tout le monde serait content, et aucun enfant serait exclus du groupe. Alors il/elle a dit qu'il/elle discuterait avec les autres enfants, et ensemble ils décideraient de vendre les billets de cirque et de faire une partie à la place."

# Appendix C

## Preliminary Analyses for Experiment 1

The majority of statistical analyses were performed using the SPSS-X statistical package (Norusis, 1985). BMDP (Dixon, 1981) was used in cases when SPSS-X failed to provide the necessary statistical test, e.g., to provide the Greenhouse-Geisser adjustment for degrees of freedom in analyses of variance.

Outliers Analysis and Treatment of Missing Data

Since further analyses were of between-group differences, data were analyzed for outliers within individual cells (Tabachnick and Fidell, 1983). For each of the 8 cells created by classification by grade, sex, and race, raw data were transformed to z-scores and then examined for extreme scores ($z = + 3.00$). No outliers were found. One missing data point for the variable Competence Rating for Black 2 was replaced by the mean for that cell.

Normality Assumption

The assumption of normal distribution of the dependent variables was examined by testing the significance of the skewness value against the standard error for skewness, given by $s = \sqrt{6/N}$ (Tabachnick and Fidell, 1983, p. 79). For the Race Perception Task, three items for individual photographed target children were significantly skewed at the $p < .05$ level: Similarity Rating for Black 1 (negative skew), Competence Rating for Black 1 (positive skew), and Competence Rating for Black 3 (positive skew). None of the averaged scores for Whites and Blacks which were used in all

analyses were significantly skewed, however. The variable Competence Rating of Self showed significant positive skew at the $p < .01$ level. Given the moderate degree of skew and the robustness of the test statistics to violation of the normality assumption with a relatively large sample size (Tabachnick and Fidell, 1983), however, it was decided not to transform this variable.

For the Interpersonal Problem-Solving Task, three variables showed significant skew: Pretest for Frisbee story (positive skew, $p < .01$), Posttest for Frisbee story (positive skew, $p < .05$), and Posttest for Circus story (negative skew, $p < .05$). Once again, it was decided not to transform the variables, due to the robustness of the test statistics to violations of the normality assumption with a large sample size, and to the complications associated with interpreting results for transformed variables.

Homogeneity of Variance Assumptions

For the Race Perception Task, univariate homogeneity of variance was tested using Cochran's C and the Bartlett-Box F statistics. One variable, Simwhm, showed significant violation of this assumption using the Bartlett-Box test, Bartlett-Box F (7, 6549) = 2.14, $p < .05$. The Cochran C statistic, a less sensitive test, was non-significant, Cochran's C (10,8) = .25, $p = .363$, therefore it was considered unnecessary to transform the variable. No other variable showed violation of the assumption of univariate

homogeneity of variance using either test of significance. Multivariate homogeneity of variance was tested using Box's M statistic. No variable showed significant violation of this assumption.

For the Interpersonal Problem-Solving Measure, univariate homogeneity of variance for pretests and posttests for the Circus and Frisbee stories was tested using Cochran's C and the Bartlett-Box test statistics, and multivariate homogeneity of variance was tested using Box's M statistic. No variable showed significant violation of either assumption. A list of variables, test statistics, and associated probability values is given in Table C - 1.

Compound Symmetry Assumption

For the Race Perception Task, the compound symmetry assumption was tested for the repeated measures design for the three competence items (self, whites, blacks). This assumption states that the pooled (over groups) variance-covariance matrix for the measures on the within-subject factor is compound symmetric, that is, having all variances and all covariances equal (Cook, 1984). The F (max) criterion and Bartlett's test of sphericity are used to test the assumptions of equality of variances and equality of covariances, respectively. When the assumption of compound symmetry is violated, one option is to use corrected F-tests by applying the Geisser-Greenhouse or Huynh-Feldt adjustments to the usual degress of freedom for

the F-tests.

For the repeated measures analysis on the competence items, tests of the compound symmetry assumption showed violation of the equal variances condition, $F(max) = 2.15$ with 2,82 df, $p < .01$, although not of the equal covariances condition, Bartlett test statistic = .44 with 1 d.f., n.s.. In order to protect against Type I errors due to violation of the assumption, Geisser-Greenhouse and Huynh-Feldt corrected F-tests are reported for this analysis.

Table C - 1

Tests of Significance of the Homogeneity of Variance Assumptions

| Variable | Cochran's C | p | Bartlett-Box F | p | Box's M | p |
|---|---|---|---|---|---|---|
| Simwhm | .247 | .363 | 2.137 | .037 | 34.21 | .067 |
| Simblm | .223 | .672 | 1.591 | .133 | 34.21 | .067 |
| Prfwhm | .256 | .297 | 1.569 | .140 | 23.68 | .414 |
| Prfblm | .217 | .786 | .838 | .555 | 23.68 | .414 |
| Comwhm | .219 | .750 | .643 | .721 | 51.37 | .349 |
| Comblm | .179 | 1.000 | 1.540 | .149 | 51.37 | .349 |
| Comself | .213 | .844 | .939 | .475 | 51.37 | .349 |
| Precirc | .127 | 1.000 | .684 | .802 | 37.56 | .946 |
| Postcirc | .112 | 1.000 | .491 | .946 | 37.56 | .946 |
| Prefris | .170 | .312 | 1.078 | .372 | 59.01 | .232 |
| Postfris | .176 | .251 | .963 | .492 | 59.01 | .232 |

Analyses of School Differences

Subjects for Study 1 were drawn from two schools in Montreal North and Riviere des Prairies, Quebec. Prior to combining the data from the two schools, a series of t-tests was performed to ensure that scores on the measured variables did not differ by school. Table C - 2 presents a list of means, standard deviations, t-statistics, and probability values for each of the variables analyzed. Results showed that 4 of the 32 variables analyzed (Age, Preference Rating for Black 3, Mean Preference Rating for Blacks, Competence Rating for White 3) were associated with a significant school difference at $p < .05$. The school difference for age is due to the fact that subjects in Grade 4 were drawn from School 2 only. Given that there was no consistent pattern to the results, and further, that no test remained significant following the Bonferonni correction for significance, it was considered appropriate to combine the data from the two schools.

Table C - 2

T-tests to Examine School Differences in Study 1 Variables

| Variable | School 1 Mean (SD) | School 2 Mean (SD) | t (df) | p |
|---|---|---|---|---|
| Age | 8.08 (.80) | 8.73 (10.77) | -2.51 (87) | .014 |
| SES | 33.21 (10.77) | 29.99 (9.92) | 1.33 (87) | .188 |
| Simwh1 | 13.04 (4.36) | 12.80 (5.05) | .21 (88) | .835 |
| Simwh2 | 11.32 (5.24) | 12.28 (4.95) | -.81 (88) | .421 |
| Simwh3 | 11.60 (4.59) | 11.21 (5.36) | .32 (88) | .752 |
| Simwhm | 11.99 (4.28) | 12.10 (4.37) | -.11 (88) | .914 |
| Simbl1 | 11.04 (7.29) | 13.69 (6.65) | -1.65 (88) | .102 |
| Simbl2 | 11.32 (6.25) | 13.64 (5.67) | -1.70 (88) | .094 |
| Simbl3 | 11.56 (5.69) | 11.40 (6.26) | .11 (88) | .912 |
| Simblm | 11.31 (5.67) | 12.91 (5.43) | -1.24 (88) | .218 |
| Prfwh1 | 6.56 (5.50) | 7.17 (6.08) | -.44 (88) | .663 |
| Prfwh2 | 7.40 (5.87) | 6.01 (4.63) | 1.18 (88) | .242 |
| Prfwh3 | 6.28 (4.90) | 7.72 (5.99) | -1.07 (88) | .286 |
| Prfwhm | 6.75 (3.90) | 6.97 (3.51) | -.26 (88) | .795 |
| Prfbl1 | 4.64 (4.42) | 8.38 (6.25) | -2.74 (88) | .007 |
| Prfbl2 | 6.68 (4.69) | 8.48 (5.73) | -1.40 (88) | .166 |
| Prfbl3 | 6.48 (6.23) | 8.43 (5.80) | -1.40 (88) | .165 |
| Prfblm | 5.93 (3.52) | 8.43 (4.08) | -2.70 (88) | .008 |
| Comwh1 | 6.52 (3.87) | 8.60 (5.35) | -1.77 (88) | .080 |
| Comwh2 | 8.08 (5.15) | 7.55 (5.27) | .43 (88) | .671 |
| Comwh3 | 7.52 (4.88) | 10.18 (5.76) | -2.05 (88) | .044 |

Table C - 2 cont ...

T-tests to Examine School Differences in Study 1 Variables

| Variable | School 1 Mean (SD) | School 2 Mean (SD) | t (df) | p |
|---|---|---|---|---|
| Comwhm | 7.37 (3.38) | 8.78 (3.11) | -1.87 (88) | .064 |
| Combl1 | 7.24 (6.61) | 7.74 (5.08) | -.38 (88) | .703 |
| Combl2 | 6.88 (4.37) | 8.86 (5.61) | -1.58 (88) | .117 |
| Combl3 | 7.28 (5.58) | 7.97 (5.29) | -.55 (88) | .587 |
| Comblm | 7.13 (3.90) | 8.19 (3.72) | -1.19 (88) | .238 |
| Comself | 2.96 (3.30) | 4.75 (4.35) | -1.87 (88) | .065 |
| Precirc | 4.92 (2.00) | 5.20 (1.58) | -.70 (88) | .487 |
| Prefris | 4.20 (1.41) | 4.31 (1.32) | -.34 (88) | .735 |
| Pstcirc | 5.84 (1.49) | 6.12 (1.70) | -.73 (88) | .467 |
| Pstfris | 4.48 (1.74) | 4.60 (1.60) | -.32 (88) | .753 |
| Folcirc | 5.72 (1.64) | 4.93 (1.49) | 1.84 (58) | .071 |

Bonferonni Family-Wise Alpha

* $p < .05$

Note: No test remained significant following the Bonferonni correction.

Variable Names for Table C - 2

Age - Age
Ses - Hollingshead 4-Factor Index
Simwh1 - Similarity Rating for White 1
Simwh2 - Similarity Rating for White 2
Simwh3 - Similarity Rating for White 3
Simwhm - Mean Similarity Rating for Whites
Simbl1 - Similarity Rating for Black 1
Simbl2 - Similarity Rating for Black 2
Simbl3 - Similarity Rating for Black 3
Simblm - Mean Similarity Rating for Blacks
Prfwh1 - Preference Rating for White 1
Prfwh2 - Preference Rating for White 2
Prfwh3 - Preference Rating for White 3
Prfwhm - Mean Preference Rating for Whites
Prfbl1 - Preference Rating for Black 1
Prfbl2 - Preference Rating for Black 2
Prfbl3 - Preference Rating for Black 3
Prfblm - Mean Preference Rating for Blacks
Comwh1 - Competence Rating for White 1
Comwh2 - Competence Rating for White 2
Comwh3 - Competence Rating for White 3
Comwhm - Mean Competence Rating for Whites
Combl1 - Competence Rating for Black 1
Combl2 - Competence Rating for Black 2
Combl3 - Competence Rating for Black 3
Comblm - Mean Competence Rating for Blacks
Comself - Competence Rating for Self
Precirc - Pre-test Score for Circus Story
Prefris - Pre-test Score for Frisbee Story
Pstcirc - Post-test Score for Circus Story
Pstfris - Post-test Score for Frisbee Story
Folcirc - Followup Score for Circus Story

# Appendix D

## Anova Summary Tables for Experiment 1

Table D - 1

Analysis of Variance Summary Table for Attractive Ratings of Photographed Children in Race Perception Task

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Groups | | | | | |
| Race of Rater | 1.31 | 1 | 1.31 | 4.16 | .058 |
| Sex of Rater | .34 | 1 | .34 | 1.09 | .311 |
| R of R X S of R | .57 | 1 | .57 | 1.80 | .198 |
| Error Term | 5.05 | 16 | .32 | | |
| Within Groups | | | | | |
| Child Group | .81 | 3 | .27 | 1.57 | .210 |
| R of R X ChG | 1.01 | 3 | .34 | 1.95 | .134 |
| S of R X ChG | .88 | 3 | .29 | 1.70 | .180 |
| R of R X S of R X ChG | .32 | 3 | .11 | .62 | .607 |
| Error Term | 8.33 | 48 | .17 | | |

Variable Name

Child Group: White Male
White Female
Black Male
Black Female

Table D - 2

Analysis of Variance Summary Table for SES

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Grade | 37.06 | 1 | 37.06 | .40 | .531 |
| Sex | 27.05 | 1 | 27.05 | .29 | .593 |
| Race | 684.55 | 1 | 684.55 | 7.31 | .008 |
| G X S | 273.41 | 1 | 273.41 | 2.92 | .091 |
| G X R | 121.91 | 1 | 121.91 | 1.30 | .257 |
| S X R | 126.70 | 1 | 126.70 | 1.35 | .248 |
| G X S X R | 250.53 | 1 | 250.53 | 2.67 | .104 |
| Error Term | 7590.21 | 81 | 93.71 | | |

Table D - 3

Analysis of Variance Summary Table for Perceived Similarity Ratings

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Subjects | | | | | |
| Grade | 174.79 | 1 | 174.79 | 11.28 | .001 |
| Sex | 6.26 | 1 | 6.26 | .40 | .527 |
| Race | 199.66 | 1 | 199.66 | 12.37 | .001 |
| G X S | 48.96 | 1 | 48.96 | 3.16 | .079 |
| G X R | .27 | 1 | .27 | .02 | .214 |
| S X R | 24.30 | 1 | 24.30 | 1.57 | .214 |
| G X S X R | 40.79 | 1 | 40.79 | 2.63 | .109 |
| Error term | 1270.95 | 82 | 15.50 | | |
| Within Subjects | | | | | |
| Race of target | 7.20 | 1 | 7.20 | 1.15 | .288 |
| G X R of t | 5.10 | 1 | 5.10 | .81 | .370 |
| S X R of t | 6.28 | 1 | 6.28 | 1.00 | .321 |
| R X R of t | 2051.17 | 1 | 2051.17 | 326.51 | 0 |
| G X S X R of t | 27.95 | 1 | 27.95 | 4.45 | .038 |
| G X R X R of t | 5.03 | 1 | 5.03 | .80 | .374 |
| S X R X R of t | .22 | 1 | .22 | .03 | .852 |
| G X S X R X R of t | .05 | 1 | .05 | .01 | .932 |
| Error term | 515.13 | 82 | 6.28 | | |

Table D - 4

Analysis of Variance Summary Table for Perceived Similarity Ratings for Boys

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Subjects | | | | | |
| Grade | 196.44 | 1 | 196.44 | 16.14 | .000 |
| Race | 34.61 | 1 | 34.61 | 2.84 | .100 |
| G X R | 17.36 | 1 | 17.36 | 1.43 | .240 |
| Error term | 462.57 | 38 | 12.17 | | |
| Within Subjects | | | | | |
| Race of target | 0.01 | 1 | 0.01 | 0.001 | .978 |
| G X R of t | 29.16 | 1 | 29.16 | 4.14 | .049 |
| R X R of t | 929.73 | 1 | 929.73 | 131.86 | 0.000 |
| G X R X R of t | 1.83 | 1 | 1.83 | .26 | .613 |
| Error term | 267.93 | 38 | 7.05 | | |

Table D - 5

Analysis of Variance Summary Table for Perceived Similarity Ratings for Girls

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between-Subjects | | | | | |
| Grade | 23.34 | 1 | 23.34 | 1.27 | .266 |
| Race | 181.50 | 1 | 181.50 | 9.88 | .003 |
| G X R | 24.00 | 1 | 24.00 | 1.31 | .259 |
| Error term | 808.38 | 44 | 18.37 | | |
| Within-Subjects | | | | | |
| Race of target | 14.00 | 1 | 14.00 | 2.49 | .122 |
| G X R of t | 4.45 | 1 | 4.45 | .79 | .378 |
| R X R of t | 1120.67 | 1 | 1120.67 | 199.48 | 0.000 |
| G X R X R of t | 3.13 | 1 | 3.13 | .56 | .459 |
| Error term | 247.19 | 44 | 5.62 | | |

Table D - 6

Analysis of Variance Summary Table for Preference Ratings

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Subjects | | | | | |
| Grade | 3.74 | 1 | 3.74 | .23 | .632 |
| Sex | 19.53 | 1 | 19.53 | 1.21 | .275 |
| Race | 73.05 | 1 | 73.05 | 4.52 | .036 |
| G X S | 1.40 | 1 | 1.40 | .09 | .769 |
| G X R | .98 | 1 | .98 | .06 | .806 |
| S X R | 63.27 | 1 | 63.27 | 3.92 | .051 |
| G X S X R | 21.38 | 1 | 21.38 | 1.32 | .253 |
| Error term | 1323.75 | 82 | 16.14 | | |
| Within Subjects | | | | | |
| Race of target | 30.97 | 1 | 30.97 | 3.14 | .080 |
| G X R of t | 30.47 | 1 | 30.47 | 3.09 | .082 |
| S X R of t | 81.67 | 1 | 81.67 | 8.29 | .005 |
| R X R of t | 181.17 | 1 | 181.17 | 18.38 | .000 |
| G X S X R of t | 6.42 | 1 | 6.42 | .65 | .422 |
| G X R X R of t | 2.94 | 1 | 2.94 | .30 | .587 |
| S X R X R of t | 4.53 | 1 | 4.53 | .46 | .500 |
| G X S X R X R of t | 3.79 | 1 | 3.79 | .38 | .537 |
| Error term | 808.25 | 82 | 9.86 | | |

Table D - 7

Analysis of Variance Summary Table for Competence Ratings - Between Subjects

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Grade | 7.41 | 1 | 7.41 | .49 | .488 |
| Sex | 29.12 | 1 | 29.12 | 1.91 | .171 |
| Race | 60.29 | 1 | 60.29 | 3.96 | .050 |
| G X S | .54 | 1 | .54 | .04 | .851 |
| G X R | 9.00 | 1 | 9.00 | .59 | .440 |
| S X R | 93.24 | 1 | 93.24 | 6.12 | .015 |
| G X S X R | 1.95 | 1 | 1.95 | .13 | .721 |
| Error term | 1249.00 | 82 | 15.23 | | |

Table D - 8

Analysis of Variance Summary Table for Competence Ratings - Within Subjects

| Source | SS | MS | df | F | p |
|---|---|---|---|---|---|
| Target | 909.54 | 454.77 | 2,164 | 37.06 | .0000 |
| GG adj: | | | 1.76,144.16 | | .0000 |
| HF adj: | | | 1.95,159.65 | | .0000 |
| G X T | 26.65 | 13.32 | 2,164 | 1.09 | .3400 |
| GG adj: | | | 1.76,144.16 | | .3338 |
| HF adj: | | | 1.95,159.65 | | .3388 |
| S X T | 39.29 | 19.65 | 2,164 | 1.60 | .2048 |
| GG adj: | | | 1.76,144.16 | | .2077 |
| HF adj: | | | 1.95,159.65 | | .2055 |
| R X T | 98.49 | 49.24 | 2,164 | 4.01 | .0199 |
| GG adj: | | | 1.76,144.16 | | .0247 |
| HF adj: | | | 1.95,159.65 | | .0208 |
| G X S X T | 14.87 | 7.44 | 2,164 | .61 | .5467 |
| GG adj: | | | 1.76,144.1 | | .5263 |
| HF adj: | | | 1.95,159.65 | | .5425 |
| G X R X T | 20.98 | 10.49 | 2,164 | .85 | .4272 |
| GG adj: | | | 1.76,144.16 | | .4148 |
| HF adj: | | | 1.95,159.65 | | .4246 |
| S X R X T | 33.57 | 16.79 | 2,164 | 1.37 | .2575 |
| GG adj: | | | 1.76,144.16 | | .2571 |
| HF adj: | | | 1.95,159.65 | | .2575 |
| G X S X R X T | 13.31 | 6.65 | 2,164 | .59 | .5825 |
| GG adj: | | | 1.76,144.16 | | .5601 |
| HF adj: | | | 1.95,159.65 | | .5778 |
| Error term | 2012.29 | 12.27 | | | |
| GGI Epsilon | 0.879 | | | | |
| H-F Epsilon | 0.973 | | | | |

Note: GG adj: Geisser-Greenhouse adjusted degrees of freedom and associated probability
HF adj: Huynh-Feldt adjusted degrees of freedom and associated probability

Table D - 9

Analysis of Variance Summary Table for IPS Pre-test Scores for Circus Story

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Grade | 16.51 | 1 | 16.51 | 5.91 | .017 |
| Sex | .42 | 1 | .42 | .15 | .701 |
| Race of Subject | 2.48 | 1 | 2.48 | .89 | .349 |
| Race of Peer | .08 | 1 | .08 | .03 | .869 |
| G X S | .47 | 1 | .47 | .17 | .682 |
| G X R of S | 2.11 | 1 | 2.11 | .76 | .388 |
| G X R of P | 9.73 | 1 | 9.73 | 3.48 | .066 |
| S X R of S | .37 | 1 | .37 | .13 | .717 |
| S X R of P | 1.42 | 1 | 1.42 | .51 | .478 |
| R of S X R of P | 1.64 | 1 | 1.64 | .59 | .445 |
| G X S X R of S | 7.30 | 1 | 7.30 | 2.61 | .110 |
| G X S X R of P | 1.17 | 1 | 1.17 | .42 | .520 |
| G X R of S X R of P | 3.44 | 1 | 3.44 | 1.23 | .270 |
| S X R of S X R of P | 2.21 | 1 | 2.21 | .79 | .377 |
| G X S X R of S X R of P | 1.54 | 1 | 1.54 | .55 | .459 |
| Within Cells | 206.75 | 74 | 2.79 | | |

Table D - 10

Analysis of Variance Summary Table for IPS Pre-test Scores for Frisbee Story

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Grade | 1.57 | 1 | 1.57 | .84 | .361 |
| Sex | .04 | 1 | .04 | .02 | .884 |
| Race of Subject | 1.47 | 1 | 1.47 | .79 | .378 |
| Race of Peer | .31 | 1 | .31 | .16 | .686 |
| G X S | .01 | 1 | .01 | .003 | .953 |
| G X R of S | .10 | 1 | .10 | .05 | .816 |
| G X R of P | .02 | 1 | .02 | .01 | .909 |
| S X R of S | 4.53 | 1 | 4.53 | 2.43 | .123 |
| S X R of P | 4.02 | 1 | 4.02 | 2.15 | .146 |
| G X S X R of S | .93 | 1 | .93 | .50 | .564 |
| G X S X R of P | 1.79 | 1 | 1.79 | .96 | .330 |
| G X R of S X R of P | .62 | 1 | .62 | .33 | .567 |
| S X R of S X R of P | 1.73 | 1 | 1.73 | .93 | .339 |
| G X S X R of S X R of P | 4.22 | 1 | 4.22 | 2.26 | .137 |
| Within Cells | 138.07 | 74 | 1.87 | | |

Table D - 11

Analysis of Variance Summary Table for Repeated Measures Analysis of IPS Pre-Post Scores for Circus Story

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between-Subjects | | | | | |
| Grade | 35.92 | 1 | 35.92 | 10.41 | .002 |
| Sex | .78 | 1 | .78 | .23 | .636 |
| Race of Subject | 1.26 | 1 | 1.26 | .36 | .548 |
| Race of Peer | .64 | 1 | .64 | .19 | .668 |
| G X S | .50 | 1 | .50 | .15 | .703 |
| G X R of S | .003 | 1 | .003 | .001 | .976 |
| G X R of P | 15.33 | 1 | 15.33 | 4.44 | .038 |
| S X R of S | .98 | 1 | .98 | .28 | .596 |
| S X R of P | .61 | 1 | .61 | .18 | .676 |
| R of S X R of P | 1.05 | 1 | 1.05 | .30 | .584 |
| G X S X R of S | 6.05 | 1 | 6.05 | 1.75 | .190 |
| G X S X R of P | 3.89 | 1 | 3.89 | 1.13 | .292 |
| G X R of S X R of P | 2.26 | 1 | 2.26 | .66 | .421 |
| S X R of S X R of P | 8.93 | 1 | 8.93 | 2.59 | .112 |
| G X S X R of S X R of P | 5.77 | 1 | 5.77 | 1.67 | .200 |
| Within Cells | 255.29 | 74 | 3.45 | | |

Table D - 11 cont ...

Within-Subjects

| | | | | | |
|---|---|---|---|---|---|
| Pre-Post | 38.27 | 1 | 38.27 | 19.39 | .000 |
| G X P-P | .06 | 1 | .06 | .03 | .861 |
| S X P-P | .001 | 1 | .001 | .000 | .984 |
| R of S X P-P | 1.23 | 1 | 1.23 | .62 | .433 |
| R of P X P-P | .17 | 1 | .17 | .08 | .773 |
| G X S X P-P | .07 | 1 | .07 | .03 | .853 |
| G X R of S X P-P | 4.56 | 1 | 4.56 | 2.26 | .137 |
| G X R of P X P-P | .28 | 1 | .28 | .13 | .724 |
| S X R of S X P-P | .02 | 1 | .02 | .01 | .926 |
| S X R of P X P-P | .82 | 1 | .82 | .42 | .521 |
| R of S X R of P X P-P | .63 | 1 | .63 | .32 | .575 |
| G X S X R of S X P-P | 1.86 | 1 | 1.86 | .94 | .335 |
| G X S X R of P X P-P | .20 | 1 | .20 | .10 | .752 |
| G X R of S X R of P X P-P | 1.26 | 1 | 1.26 | .64 | .427 |
| S X R of S X R of P X P-P | .78 | 1 | .78 | .40 | .531 |
| G X S X R of S X R of P X P-P | .41 | 1 | .41 | .21 | .648 |
| Within Cells | 146.03 | 74 | 1.97 | | |

Table D - 12

Analysis of Variance Summary Table for Repeated Measures Analysis of IPS Pre-Post Scores for Frisbee Story

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Subjects | | | | | |
| Grade | 9.19 | 1 | 9.19 | 2.79 | .099 |
| Sex | 2.43 | 1 | 2.43 | .74 | .393 |
| Race of Subject | 2.04 | 1 | 2.04 | .62 | .434 |
| Race of Peer | 3.98 | 1 | 3.98 | 1.21 | .276 |
| G X S | 1.37 | 1 | 1.37 | .42 | .521 |
| G X R of S | 2.00 | 1 | 2.00 | .61 | .439 |
| G X R of P | .18 | 1 | .18 | .06 | .815 |
| S X R of S | 4.17 | 1 | 4.17 | 1.26 | .264 |
| S X R of P | 10.67 | 1 | 10.67 | 3.23 | .076 |
| R of S X R of P | .89 | 1 | .89 | .27 | .605 |
| G X S X R of S | .000 | 1 | .000 | .000 | .991 |
| G X S X R of P | 11.96 | 1 | 11.96 | 3.63 | .061 |
| G X R of S X R of P | 1.58 | 1 | 1.58 | .48 | .490 |
| S X R of S X R of P | 3.11 | 1 | 3.11 | .94 | .335 |
| G X S X R of S X R of P | 13.35 | 1 | 13.35 | 4.05 | .048 |
| Within Cells | 244.00 | 74 | 3.30 | | |

Table D - 12 cont...

Within-Subjects

| | | | | | |
|---|---|---|---|---|---|
| Pre-Post | 3.76 | 1 | 3.76 | 4.22 | .043 |
| G X P-P | 1.58 | 1 | 1.58 | 1.77 | .187 |
| S X P-P | 1.63 | 1 | 1.63 | 1.83 | .180 |
| R of S X P-P | .08 | 1 | .08 | .09 | .762 |
| R of P X P-P | 1.47 | 1 | 1.47 | 1.65 | .203 |
| G X S X P-P | 1.65 | 1 | 1.65 | 1.85 | .177 |
| G X R of S X P-P | .93 | 1 | .93 | 1.04 | .311 |
| G X R of P X P-P | .04 | 1 | .04 | .05 | .828 |
| S X R of S X P-P | .94 | 1 | .94 | 1.05 | .308 |
| S X R of P X P-P | .19 | 1 | .19 | .21 | .649 |
| R of S X R of P X P-P | .03 | 1 | .03 | .03 | .853 |
| G X S X R of S X P-P | 1.81 | 1 | 1.81 | 2.03 | .158 |
| G X S X R of P X P-P | 2.45 | 1 | 2.45 | 2.75 | .101 |
| G X R of S X R of P X P-P | .02 | 1 | .02 | .02 | .875 |
| S X R of S X R of P X P-P | .01 | 1 | .01 | .01 | .920 |
| G X S X R of S X R of P X P-P | .56 | 1 | .56 | .63 | .431 |
| Within Cells | 65.87 | 74 | .89 | | |

Table D - 13

Analysis of Variance Summary Table for Repeated Measures Analysis of IPS Pre-Post Scores for Frisbee Story: Girls

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Subjects | | | | | |
| Grade | 9.38 | 1 | 9.38 | 2.87 | .098 |
| Race of Subject | .17 | 1 | .17 | .05 | .822 |
| Race of Peer | 13.50 | 1 | 13.50 | 4.13 | .049 |
| G X R of S | .67 | 1 | .67 | .20 | .654 |
| G X R of P | 8.17 | 1 | 8.17 | 2.50 | .122 |
| R of S X R of P | 3.38 | 1 | 3.38 | 1.03 | .316 |
| G X R of S X R of P | 12.04 | 1 | 12.04 | 3.69 | .062 |
| Within Cells | 130.67 | 40 | 3.27 | | |
| Within Subjects | | | | | |
| Pre-Post | 5.04 | 1 | 5.04 | 5.40 | .025 |
| G X P-P | 3.38 | 1 | 3.38 | 3.62 | .064 |
| R of S X P-P | .17 | 1 | .17 | .18 | .675 |
| R of P X P-P | 1.50 | 1 | 1.50 | 1.61 | .212 |
| G X R of S X P-P | 2.67 | 1 | 2.67 | 2.86 | .099 |
| G X R of P X P-P | 1.50 | 1 | 1.50 | 1.61 | .212 |
| R of S X R of P X P-P | .04 | 1 | .04 | .04 | .334 |
| G X R of S X R of P X P-P | .38 | 1 | .38 | .40 | .530 |
| Within Cells | 37.33 | 40 | .93 | | |

Table D - 14

Analysis of Variance Summary Table for Repeated Measures Analysis of IPS Pre-Post Scores for Frisbee Story: Boys

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Grade | 1.60 | 1 | 1.60 | .48 | .494 |
| Between Subjects | | | | | |
| Race of Subject | 6.41 | 1 | 6.41 | 1.92 | .174 |
| Race of Peer | 1.16 | 1 | 1.16 | .35 | .558 |
| G X R of S | .66 | 1 | .66 | .20 | .660 |
| G X R of P | 4.29 | 1 | 4.29 | 1.29 | .265 |
| R of S X R of P | .37 | 1 | .37 | .11 | .742 |
| G X R of S X R of P | 3.13 | 1 | 3.13 | .94 | .339 |
| Within Cells | 113.33 | 34 | 3.33 | | |
| Within Subjects | | | | | |
| Pre-Post | .19 | 1 | .19 | .23 | .637 |
| G X P-P | .002 | 1 | .002 | .002 | .964 |
| R of S X P-P | .73 | 1 | .73 | .87 | .358 |
| R of P X P-P | .25 | 1 | .25 | .29 | .591 |
| G X R of S X P-P | .10 | 1 | .10 | .12 | .737 |
| G X R of P X P-P | 1.00 | 1 | 1.00 | 1.19 | .283 |
| R of S X R of P X P-P | .002 | 1 | .002 | .003 | .958 |
| G X R of S X R of P X P-P | .20 | 1 | .20 | .24 | .625 |
| Within Cells | 28.53 | 34 | .84 | | |

Table D - 15

Analysis of Variance Summary Table for Repeated Measures Analysis of IPS Pre-Post-Followup Scores for Circus Story

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Subjects | | | | | |
| Grade | 17.72 | 1 | 17.72 | 4.66 | .035 |
| Race of Peer | 2.22 | 1 | 2.22 | .58 | .449 |
| G X R of P | 26.51 | 1 | 26.51 | 6.97 | .011 |
| Within Cells | 213.08 | 56 | 3.80 | | |
| Within Subjects | | | | | |
| Pre-Post-Follow | 38.43 | 2 | 19.22 | 10.12 | .000 |
| G X P-P-F | 1.15 | 2 | .58 | .30 | .739 |
| R of P X P-P-F | 1.56 | 2 | .78 | .41 | .664 |
| G X R of P X P-P-F | 4.93 | 2 | 2.47 | 1.30 | .277 |
| Within Cells | 212.59 | 112 | 1.90 | | |

# Appendix E

## Correlations for Measures used in Experiment 1

Table E - 1

Summary of Multiple Regression Analyses of Grade Differences in Patterns of Correlations on the Race Perception Task

| Dependent Variable | Predictor | F to enter | $R^2$ change | p |
|---|---|---|---|---|
| Prfwhm | Comwhm | 25.22 | .22 | .000 |
| | Grade | .07 | .00 | .796 |
| | Comwhm X Grade | .19 | .00 | .664 |
| Prfblm | Comblm | 43.42 | .33 | .000 |
| | Grade | 1.14 | .01 | .288 |
| | Comblm X Grade | 1.65 | .01 | .203 |
| Simwhm | Comwhm | .98 | .01 | .326 |
| | Grade | 6.32 | .07 | .014 |
| | Comwhm X Grade | 6.09 | .06 | .016 |
| Simblm | Comblm | 13.77 | .14 | .000 |
| | Grade | 3.31 | .03 | .072 |
| | Comblm X Grade | .15 | .00 | .702 |
| Prfwhm | Simblm | 1.10 | .01 | .297 |
| | Grade | .19 | .00 | .663 |
| | Simwhm X Grade | 4.57 | .05 | .035 |
| Prfblm | Simblm | 17.08 | .16 | .000 |
| | Grade | 4.35 | .04 | .040 |
| | Simblm X Grade | 1.13 | .01 | .291 |

Variable Names

Simwhm - Mean similarity rating for White targets
Simblm - Mean similarity rating for Black targets
Prfwhm - Mean preference rating for White targets
Prfblm - Mean preference rating for Black targets
Comwhm - Mean competence rating for White targets
Comblm - Mean competence rating for Black targets

Table E - 2

Intercorrelations between Items in Race Perception Task (n = 90)

| Variable | Simwhm | Simblm | Prfwhm | Prfblm | Comwhm | Comblm | Comself |
|---|---|---|---|---|---|---|---|
| Simwhm | -- | -.20 | .11 | -.18 | .10 | -.12 | .06 |
| Simblm | | -- | .01 | .40* | .07 | .37* | -.02 |
| Prfwhm | | | -- | .15 | .47* | .20 | .06 |
| Prfblm | | | | -- | .12 | .57* | -.15 |
| Comwhm | | | | | -- | .26 | .04 |
| Comblm | | | | | | -- | .00 |
| Comself | | | | | | | -- |

Variable Names

Simwhm - Mean similarity rating for White targets
Simblm - Mean similarity rating for Black targets
Prfwhm - Mean preference rating for White targets
Prfblm - Mean preference rating for Black targets
Comwhm - Mean competence rating for White targets
Comblm - Mean competence rating for Black targets
Comself - Competence rating for Self

Bonferroni Family-Wise Alpha

* $p < .05$

Table E - 3

Intercorrelations between Stories in Interpersonal Problem-Solving Measure (n = 90)

| Variable | Circus Posttest | Frisbee Pretest | Frisbee Posttest |
|---|---|---|---|
| Circus Pretest | .36** | .16 | .11 |
| Circus Posttest | -- | .14 | .20 |
| Frisbee Pretest | | -- | .60** |
| Frisbee Posttest | | | -- |

Bonferonni Family-Wise Alpha

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

# Appendix F

## Parent Letters for Experiment 2

Appendix F - 1. Parent Consent Letter for Experiment 2

Montréal, le 12 février, 1987

Chers parents,

Nous aimerions savoir si vous consentiriez à ce que votre enfant participe, à son ecole, à un projet de recherche sur le développement de l'enfant. Notre etude a été approuvée par la CECM et le Comite de l'ecole, et est subventionnée par les Fonds pour la formation des chercheurs et l'aide à la recherche du Québec. Le projet a pour sujet la capacité des enfants de developper de nouvelles solutions aux dilemmes interpersonnels, grâce aux idées provenant de leurs camarades de classe. Nous croyons que notre etude contribuera a l'évaluation des facteurs qui facilitent l'apprentissage des enfants grâce aux idees de leurs amis.

Avec votre permission, la prémière étape de notre projet sera de demander a chacun des enfants participants de nous indiquer sur un formulaire confidentiel a quel point (i.e., beaucoup ou un peu) il/elle est lie(e) d'amitié avec chaque enfant dans sa classe. (Nous ne demandons pas a l'enfant de nous nommer les enfants qu'il/elle n'aime pas). Cette tâche dure 5 minutes et sera accomplie a un moment convenu avec le professeur. A ce moment, nous aimerions aussi prendre une photo de votre enfant, que nous vous donnerons lorsque l'étude sera terminee. Il est important, pour la deuxième partie de notre étude expliquee ci-bas, de savoir qui sont les amis de votre enfant, et d'avoir leurs photos.

Dans la deuxième étape de l'étude, nous aimerions demander à votre enfant de participer, au cours des cinq prochains mois et ceci durant les heures d'ecole, a deux séances de 25 minutes. Pendant ces séances, un membre de notre equipe de recherche montrera a votre enfant les photos d'enfants qui sont ses meilleurs et ses moins bons amis, et lui demandera d'indiquer a quel point il/elle pense que les enfants lui ressemblent dans leurs préférences pour diverses activités telles que l'école et les sports. On lui demandera aussi son avis concernant deux dilemmes interpersonnels, par exemple, si un enfant devrait monter dans un arbre pour sauver un chaton, apres avoir promis a son père qu'il ne grimperait pas dans les arbres. Par la suite, on discutera avec lui/elle des solutions alternatives aux dilemmes. Nous croyons que l'experience sera enrichissante pour votre enfant, dans la mesure ou il/elle apprendra des nouvelles solutions aux dilemmes. Les enfants trouvent généralement ces activités fort interessantes et aucun enfant n'est jamais forcé d'y participer.

Un résumé plus détaillé de notre projet est disponible au secrétariat de l'école. Si vous désirez plus de renseignements, vous pouvez communiquer avec Rosemary Feltham au 848-2257 ou 848-7560 (le jour).

Veuillez, s'il vous plaît, indiquer sur le formulaire ci-joint si vous consentez ou non à la participation de votre enfant à notre étude. Si vous êtes d'accord, veuillez s'il vous plaît, répondre aussi aux questions additionnelles. Nous apprécierions que vous nous fassiez parvenir le formulaire aussitôt que possible, dans l'enveloppe pré-adressée. Les renseignements receuillis, ainsi que la photo, seront utilisés dans le cadre du projet par l'equipe de recherche seulement. Lorsque l'étude sera terminée, nous serons heureuses de vous faire parvenir un bref résume des résultats de notre projet.

Nous vous remercions beaucoup,

| | |
|---|---|
| Rosemary Feltham, M.A. | Anna-Beth Doyle, Ph.D. |
| Coordinatrice du projet | Professeur agrégé |

Appendix F - 2. Parent Consent Form for Experiment 2

Février, 1987

FORMULAIRE DE PARTICIPATION

Nom de l'enfant _____ Classe _____
ECOLE

J'accepte ____ Je n'accepte pas ____ que mon enfant participe au projet de recherche de Mme. Doyle à l'école de mon enfant.

Nom du parent ou tuteur _____
Tel.: _____

Signature _____

---

SI VOUS ACCEPTEZ QUE VOTRE ENFANT PARTICIPE AU PROJET, VEUILLEZ FOURNIR LES RENSEIGNEMENTS CI-DESSOUS:

Date de naissance de l'enfant _____

Sexe de l'enfant M F

Quelle(s) langue(s) votre enfant parle-t-il à la maison?
Français _____ Anglais _____
Autre (Nommer s.v.p.) _____

Scolarité de la mère (niveau le plus éléve atteint ou diplôme obtenu):

Ecole primaire _____ Ecole secondaire _____ CEGEP _____
Université: Bacc. ____ Maîtrise ____ Doctorat ____

Scolarite du père (niveau le plus élévé atteint ou diplôme obtenu):

Ecole primaire _____ Ecole secondaire _____ CEGEP _____
Université: Bacc. ____ Maîtrise ____ Doctorat ____

SI VOUS DESIREZ RECEVOIR UN RAPPORT DU PROJET, INSCRIVEZ VOTRE ADRESSE, S.V.P.:

_____

_____

Appendix F - 3. Followup Letter Sent to Parents for Experiment 2

Montréal, le 12 juin, 1987

Chers parents,

Au mois d'avril 1987, nous vous avons demandé votre consentement pour que votre enfant participe à un projet de recherche sur le développement de l'enfant. Nous vous remercions d'avoir donné votre permission, et nous aimerions vous informer que le projet avance bien. Un membre de notre équipe a eu le plaisir de rencontrer votre enfant et de discuter de ses idées à propos des dilemmes interpersonnels. Nous sommes maintenant en train d'analyser les informations recueillies, et nous vous enverrons un résumé des résultats lorsque les analyses seront complétées.

Nous vous écrivons cette fois pour vous demander votre participation à l'étape finale du projet. Maintenant que plusieurs semaines se sont écoulées après notre rencontre avec votre enfant, nous aimerions de nouveau connaître ses idees à propos d'un dilemme interpersonnel. Pour accomplir ce but, nous vous demandons un petit service. Pourriez-vous, s'il vous plaît, lire à votre enfant la courte histoire que vous trouverez ci-jointe, noter sur la feuille sa réponse à trois questions, et nous renvoyer la feuille dans l'enveloppe fournie? Ceci ne prendra que cinq minutes de votre temps, et en plus de nous aider, l'histoire vous donnera une idee du genre de dilemme dont on a discuté avec votre enfant.

En faisant cette tâche, il est très important que vous écriviez la réponse de votre enfant sans la discuter. Les enfants donnent une variété de réponses face aux dilemmes comme celui que vous allez lui lire, et nous voulons simplement savoir qu'est-ce qu'il ou elle a répondu. Autrement dit, toutes les réponses sont bonnes. Apres que vous avez complété la questionnaire, vous pouvez bien sûr discuter du dilemme avec votre enfant. Ce n'est pas necessaire de retourner le dessin qui accompagne l'histoire.

Si vous avez des questions à nous poser, s'il vous plaît n'hésitez pas à appeler Rosemary Feltham au 848-2257 ou 848-7560 (le jour). Nous vous souhaitons du plaisir avec votre enfant et nous vous remercions encore une fois de votre cooperation.

| | |
|---|---|
| Rosemary Feltham, M.A. | Anna-Beth Doyle, Ph.D. |
| Coordinatrice du projet | Professeure agrégée |

Appendix F - 4. Example of Followup Form Sent to Parents

Nom de l'enfant _____

Ecole _____ Classe _____ Date _____

Marie est un enfant qui joue à la maison avec trois autres enfants. Son père arrive avec, comme surprise, des billets pour aller au cirque le samedi après-midi. Il y a 5 billets: 2 pour sa mère et son père, 1 pour Marie, et 2 pour les autres enfants. Il y a un problème parce que Marie ne peut pas emmener tous les enfants, et on ne peut pas acheter un autre billet parce qu'il n'en reste plus. Sophie fête son anniversaire, et Marie lui avait promis de l'emmener en un endroit spécial. Johanne vient d'une famille qui n'a pas beaucoup d'argent, et elle n'a pas souvent l'occasion de faire de belles sorties. Thérèse vient de démenager dans le quartier. Elle veut rencontrer d'autres enfants, et la semaine dernière, Marie a été invitée au cinéma par la famille de Thérèse. Maintenant, un problème se pose.

1. Faisons semblant que tu es Marie. Qu'est-ce qui serait la meilleure facon de régler ce problème? (Rappelez-vous qu'on ne peut pas acheter un autre billet; il n'en reste plus.)

Réponse de l'enfant: _____

_____

_____

_____

2. Pourquoi penses-tu que c'est la meilleure facon de régler le problème?:

_____

_____

_____

3: Qu'est-ce qui va se passer si tu règles le problème comme ça?

_____

_____

_____

La personne remplissant le formulaire:

Mère _____ Père _____ Autre (spécifiez s.v.p.) _____

Retournez à: A.B. Doyle, ER-100
Centre de recherche en développement humaine
Département de psychologie
Université Concordia
1455 boul. de Maisonneuve ouest
Montréal, Québec
H3G 1M8

MERCI BEAUCOUP

# Appendix G

## Measures Used in Experiment 2

Appendix G - 1. Example of Friendship Rating Scale for Girls

Nom: _____ Date: le 30 avril 1987

Ecole: _____ Classe: _____

Voici une liste des filles dans ta classe. Nous voulons découvrir quelque chose à propos des amis des enfants. Qui sont tes amies?

1. En utilisant la ligne à GAUCHE de chaque nom, mets un chiffre pour indiquer à quel point la fille est ton amie:

1 - MEILLEURE AMIE

2 - BONNE AMIE

3 - AMIE "CORRECTE"

4 - FILLE CORRECTE MAIS PAS UNE VRAIE AMIE

Laisses un blanc si tu ne connais pas très bien la personne ou si tu ne l'aimes pas beaucoup.

| | | | | | | |
|---|---|---|---|---|---|---|
| _____ | Nom | 1 | 2 | 3 | 4 | 5 |
| _____ | Nom | 1 | 2 | 3 | 4 | 5 |
| _____ | Nom | 1 | 2 | 3 | 4 | 5 |
| _____ | Nom | 1 | 2 | 3 | 4 | 5 |
| _____ | Nom | 1 | 2 | 3 | 4 | 5 |
| _____ | Nom | 1 | 2 | 3 | 4 | 5 |
| _____ | Nom | 1 | 2 | 3 | 4 | 5 |

2. En utilisant les numéros à DROITE de chaque nom, encercles le numéro qui indique à quel point tu aimes jouer avec cette personne.

1 - PAS DU TOUT
2 - UN PETIT PEU
3 - UN PEU
4 - PAS MAL
5 - BEAUCOUP

Appendix G - 2. Chumship Checklist for Girls

## Chumship Checklist: Girls

Nom: _____ Classe: ____ Date: _____

Nom de l'autre enfant: _____

| Item | Toujours | De temps en temps | Jamais |
|---|---|---|---|
| 1. Vous jouez à des jeux où vous êtes a tour de rôle le meneur | 2 | 1 | 0 |
| 2. Vous marchez à l'école ensemble | 2 | 1 | 0 |
| 3. Vous vous entraidez lorsque l'un d'entre vous est en retard dans son travail | 2 | 1 | 0 |
| 4. Vous parlez des garçons | 2 | 1 | 0 |
| 5. Vous partagez des jeux | 2 | 1 | 0 |
| 6. Vous vous dites des choses que l'on ne dirait pas à quelqu'un d'autre | 2 | 1 | 0 |
| 7. Vous protégez l'autre si une fille plus vielle agace l'une d'entre vous | 2 | 1 | 0 |
| 8. Vous vous asseyez ensemble dans l'autobus scolaire | 2 | 1 | 0 |
| 9. Vous essayez d'être dans la même equipe de sport même si l'autre n'est pas le meilleur joueur | 2 | 1 | 0 |
| 10. Vous faites des choses "le fun" ensemble comme aller au cinéma | 2 | 1 | 0 |
| 11. Vous parlez si l'une d'entre vous a fait quelque chose qui n'était pas bien | 2 | 1 | 0 |
| 12. Vous vous téléphonez au sujet des devoirs de l'ecole | 2 | 1 | 0 |
| 13. Vous parlez de ce que vous voulez faire lorsque vous serez grande | 2 | 1 | 0 |

| | | | |
|---|---|---|---|
| 14. Vous dormez chez l'autre | 2 | 1 | 0 |
| 15. Vous parlez au sujet de vos parents | 2 | 1 | 0 |
| 16. Vous trouvez cela difficile d'être en désaccord avec elle au sujet de chose importante | 2 | 1 | 0 |
| 17. Vous allez en vacances ou vous faites un petit voyage avec elle et sa famille | 2 | 1 | 0 |

Appendix G - 3. Chumship Checklist for Boys

Chumship Checklist: Boys

Nom: _____ Classe: ____ Date: _____

Nom de l'autre enfant: _____

| Item | Toujours | De temps en temps | Jamais |
|---|---|---|---|
| 1. Vous jouez à des jeux où vous êtes a tour de rôle le meneur | 2 | 1 | 0 |
| 2. Vous marchez à l'école ensemble | 2 | 1 | 0 |
| 3. Vous vous entraidez lorsque l'un d'entre vous est en retard dans son travail | 2 | 1 | 0 |
| 4. Vous parlez des filles | 2 | 1 | 0 |
| 5. Vous partagez des jeux | 2 | 1 | 0 |
| 6. Vous vous dites des choses que l'on ne dirait pas à quelqu'un d'autre | 2 | 1 | 0 |
| 7. Vous protégez l'autre si un garçon plus vieux agace l'un d'entre vous | 2 | 1 | 0 |
| 8. Vous vous asseyez ensemble dans l'autobus scolaire | 2 | 1 | 0 |
| 9. Vous essayez d'être dans la même equipe de sport même si l'autre n'est pas le meilleur joueur | 2 | 1 | 0 |
| 10. Vous faites des choses "le fun" ensemble comme aller au cinéma | 2 | 1 | 0 |
| 11. Vous parlez si l'un d'entre vous a fait quelque chose qui n'était pas bien | 2 | 1 | 0 |
| 12. Vous vous téléphonez au sujet des devoirs d'école | 2 | 1 | 0 |
| 13. Vous parlez de ce que vous voulez faire lorsque vous serez grand | 2 | 1 | 0 |

| | | | |
|---|---|---|---|
| 14. Vous dormez chez l'autre | 2 | 1 | 0 |
| 15. Vous parlez au sujet de vos parents | 2 | 1 | 0 |
| 16. Vous trouvez cela difficile d'être en désaccord avec lui au sujet de chose importante | 2 | 1 | 0 |
| 17. Vous allez en vacances ou vous faites un petit voyage avec lui et sa famille | 2 | 1 | 0 |

## Appendix G - 4. Administration Instructions for Friend Perception Task

### Friend Perception Task

Marche a suivre

Pour chaque question, utilisez des photos d'enfants du même sexe qui sont les amis et les non-amis du sujet (quatre photos au maximum).

1. Similitudes et Différences

(a) Placez l'échelle de similitudes et différences verticalement devant l'enfant, avec 1 près de lui/elle. Dites: Voici mon jeu de similitudes et différences. C'est un jeu ou l'on va dire si les choses sont pareilles ou différentes l'une de l'autre. Nous utiliserons cette echelle-ci, et si les choses que je te montre se ressemblent beaucoup, nous les placerons proche l'une de l'autre, et si les choses sont differentes, on va les placer loin l'une de l'autre. D'accord? Es-tu prêt? Nous allons commencer par te montrer comment le jeu fonctionne. Placez les photos de la pomme, la banane, et les loups sur la table. Présentez des pairs de photos à l'enfant dans l'ordre suivant: Loup1 - Loup2; Pomme - Loup1; Pomme - Orange. Pour chaque pair de photos, dites: Places les photos très proches si elles se ressemblent beaucoup, un peu proches si elles se ressemblent un petit peu, et places les loins si elles sont différentes l'une de l'autre. D'accord? Avant de procéder, assurez-vous que l'enfant comprenne le principe de représenter des similarites et des différences par la distance sur l'echelle. Si l'enfant n'emploie que les extremités de l'echelle, alors prenez les deux loups et dites: Ces choses sont un peu différentes, mais pas beaucoup differentes, alors on les met ici (placez les photos environ à 1 et 4). O.K.? Ensuite, repétez la présentation des photos d'entrainement.

(b) Gardez l'echelle dans sa position verticale (1 près du sujet) et placez les photos dans un demi-cercle à côte de l'echelle. Dites: Maintenant on va jouer à notre jeu de similitudes et differences avec ces photos d'enfants. Places les photos tres proches si elles se ressemblent beaucoup, un peu proches si elles se ressemblent un petit peu, et places les loins si elles sont différentes. Presentez les photos à l'enfant. Après que l'enfant ait place toutes les photos, choisissez la photo de l'enfant que le sujet a place le plus proche de lui-même, et pour chacun, demandez: En quoi cet enfant te ressemble-t- il/elle? et Quelles sont les differences entre toi et cet enfant?

2. Perception de similitude de compétence

Gardez l'échelle verticalement et dites: Maintenant nous allons faire un jeu où l'on dit si les gens sont bons ou moins bons pour faire quelque chose. Près de toi, c'est pour dire qu'on est très bon et loin de toi, c'est pour dire qu'on n'est pas bon du tout, et au milieu, c'est pour dire qu'on est assez bon. D'accord? Maintenant, quelle est ton sujet préféré à l'école? Après avoir eu la reponse de l'enfant, placez les 4 photos et la photo de soi-même dans un demi-cercle sur la table à côte de l'echelle. Dites: Voici des photos de toi et d'autres enfants. Places les photos ici sur l'échelle pour me montrer a quel point ils sont bons en _____ (sujet prefere de l'enfant). Si l'enfant est bon, places-le ici (indiquez l'extremité de l'échelle près de l'enfant), s'il est assez bon, places-le ici (indiquez le milieu de l'échelle) et si l'enfant n'est pas bon, places-le ici (indiquez l'extremité de l'échelle loin de l'enfant). On va commencer avec la photo de toi-même. Après que l'enfant ait place sa photo de lui-même, demandez-lui de placer chacune des autres photos.

3. Préférence de compagnon de jeu

Gardez l'échelle dans la position verticale. Dites: Maintenant, on va faire un jeu où l'on dit à quel point on aime jouer avec quelqu'un. Si tu aimes beaucoup un petit peu jouer avec la personne, tu places la photo pres de toi, si tu aimes jouer avec la personne, tu places la photo au milieu, et si tu n'aimes pas jouer avec la personne, tu places la photo plus loin. D'accord? Placez les photos des enfants dans un demi-cercle sur la table a côte de l'échelle. Maintenant, je veux savoir a quel point tu aimerais jouer avec cet enfant ici. Places sa photo sur l'échelle pour me montrer à quel point que tu aimerais jouer avec lui/elle. Si tu aimerais beaucoup jouer avec l'enfant, places sa photo près de la photo de toi-même, si tu aimerais un peu jouer avec l'enfant, places sa photo au milieu, et si tu n'aimerais pas jouer avec l'enfant, places sa photo loin de toi. D'accord? Répétez pour chaque photo.

Appendix G - 5. Response Form for Friend Perception Task

Perceived Similarity Measure - Response Sheet

Name: _____ Date: _____
School: _____ Age: ___ Grade: ___ Sex: ___ Race: ___

1. Perceived Similarity

(a) Loup 1 _____ Loup 2 _____
Pomme _____ Loup1 _____
Pomme _____ Orange _____

(b) (i) Soi-même: _____ Enfant 1 _____

PAREIL - _____

_____

DIFFERENT - _____

_____

(ii) Soi-même: _____ Enfant 2 _____

PAREIL - _____

_____

DIFFERENT - _____

_____

(iii) Soi-même: _____ Enfant 3 _____

PAREIL - _____

_____

DIFFERENT - _____

_____

(iv) Soi-même: _____ Enfant 4 _____

PAREIL - _____

_____

DIFFERENT - _____

_____

2. Perception de compétence

(a) Sujet préféré: _____

Soi-même _____

Enfant 1 _____ Enfant 2 _____

Enfant 3 _____ Enfant 4 _____

3. Préférence de Compagnon de Jeu

(b) Enfant 1 _____ Enfant 2 _____

Enfant 3 _____ Enfant 4 _____

Appendix G - 6. Interpersonal Problem-Solving Measure used in Experiment 2

## Interpersonal Problem-Solving Measure - Revised

### Stories

### Le Frisbee

André/Anne est celui/celle qui est mis en charge pendant que sa mere est sortie. Il/elle garde son/sa plus jeune frère/soeur, David/Sara, pendant que leur mère est absente. Avant son départ, la mère rappela à Andre/Anne de ne pas laisser David/Sara jouer avec le frisbee qu'il/elle venait d'apporter dans la maison, et elle rappela à David/Sara de ne pas inviter des ami(e)s. Pendant l'absence de leur mere, David/Sara a invité son ami(e) Pierre/Jocelyne a venir jouer même si sa mère avait dit de ne pas inviter des ami(e)s pendant son absence, et Andre n'a rien dit. Lors de sa visite, Pierre/Jocelyne trouve le frisbee et le lance d'un bout a l'autre du salon. Le frisbee frappe la lampe preférce de la mere qui est placée sur une table, et la brise. Au même moment la mère arrive à la maison. Maintenant, il y a un problème. Fais semblant que tu es Andre/Anne.

### Le Cirque

Marie/Paul est un(e) enfant qui joue avec trois autres enfants a la maison. Son pere arrive avec, comme surprise, des billets pour aller au cirque samedi après-midi. Il y a 5 billets: 2 pour sa mère et son père, 1 pour Marie/Paul, et 2 pour les autres enfants. Il y a un probleme parce que Marie/Paul ne peut pas emmener tous les enfants, et parce qu'il n'en reste plus, on ne peut pas acheter un autre billet. Sophie/John fête son anniversaire, et Marie/Paul lui avait promis de l'emmener dans un endroit spécial. Johanne/Robert vient d'une famille qui n'a pas beaucoup d'argent, et n'a pas souvent l'occasion de faire de belles sorties. Therèse/Stefan vient de démenager dans le quartier. Il/elle veut rencontrer d'autres enfants, et la semaine dernière, Marie/Paul a éte invité(e) au cinéma par la famille de Therèse/Stéfan. Maintenant, il y a un probleme. Fais semblant que tu es Marie/Paul.

## Le Ballon

Marc/Marie-Claude est l'enfant que tu vois ici. Un jour, son/sa petit/e frère/soeur Julien/Christine a invite son ami(e) Etienne/Suzanne à venir jouer chez eux. Les deux garçons/filles ont demandé à Marc/Marie-Claude, qui était plus grand/e. de les aider à trouver un ballon. Marc/Marie-Claude leur a donné le ballon de soccer de leur père, et les petits enfants ont joué une belle partie de soccer. Lorsqu'ils/elles ont eu fini de jouer, ils/elles n'ont pas serré le ballon, et ils/elles ne l'ont pas non plus remis à Marc/Marie-Claude. Le ballon est resté dehors. Le lendemain, le père a demandé son ballon pour jouer au soccer avec l'équipe du quartier, mais le ballon n'etait plus dehors, ni dans sa place habituelle, et même en cherchant, ils ne l'ont plus retrouve. Maintenant, il y a un problème. Fais semblant que tu es Marc/Marie-Claude.

## Le Ski

François/Caroline est l'enfant que tu vois ici. Un vendredi après-midi, son père/sa mère lui a dit que le samedi il/elle amènerait François/Caroline faire du ski. Il/elle lui a dit qu'il y avait aussi de la place pour quatre autres personnes dans l'auto et quatre autres paires de ski dans le rack. Francois/Caroline peut inviter deux ami(e)s et leurs père/mère à venir en ski avec eux. Comme ça, il y aurait 3 garçons/filles et 3 peres/meres, et tout le monde pourrait s'amuser. François/Caroline etait bien heureux/se de pouvoir amener ses amis en ski, mais il/elle s'est rendu/e compte qu'il y avait un probleme parce qu'il/elle avait trois amis et qu'il/elle aurait aimer tous les inviter, alors qu'il n'y avait de la place que pour deux ami(e)s et leurs pères/mères. Parmi ses ami(e)s, il y avait Martin/Julie, qui ne sort pas souvent de la ville et qui aurait bien aimé apprendre a faire du ski, Yves/Marie-Eve qui est son/sa cousin/e et qui l'avait appelle la veille pour jouer chez lui/elle, et Alexandre/Claire, qui sait deja faire du ski et qui pourrait lui montrer des trucs de ski. Maintenant, il y a un problème. Fais semblant que tu es François/Caroline.

Appendix G - 7. Pretest and Posttest Interviews for Experiment 2

## Pretest interview

1. For each of the four stories on the IPS-R, read the story and ask the following four questions:

(a) Quelle est la meilleure chose à faire pour resoudre le probleme?

(b) Qui devrait la faire/aller? (If child does not specify in answer to (a).)

(c) Pourquoi est-ce que c'est la meilleure chose à faire?

(d) Qu'est-ce que tu penses qui arrivera si tu fais _____ ?

## Posttest interview

1. For dilemma discussed by the two children, ask:

a) Quelle était ta réponse avant la discussion?
b) Quelle etait la reponse de l'autre enfant au début de la discussion?

c) Quelles autres réponses as-tu trouvées pendant la discussion? Est-ce qu'il y en a d'autres?

d) Quelles autres réponses l'autre enfant a-t-il/elle trouvees pendant la discussion? Est-ce qu'il y en a d'autres?

e) Selon toi, quelle est la meilleure manière pour resoudre le problème?

f) Qui devrait le faire?

g) Pourquoi est-ce que c'est la meilleure chose à faire?

h) Qu'est-ce que tu penses qui arrivera si tu fais _____ ? (reponse de (e))

2. For each of the three other stories, remind the child of the story and ask the following four questions:

(a) Quelle est la meilleure chose à faire pour resoudre le problème?

(b) Qui devrait la faire/aller? (If not specified in (a).)

(c) Pourquoi est-ce que c'est la meilleure chose à faire?

(d) Qu'est-ce que tu penses qui arrivera si tu fais _____ ?

Appendix G - 7. Scoring Scheme for Interpersonal Problem-Solving Measure used in Exp. 2

SCORING FOR INTERPERSONAL PROBLEM-SOLVING MEASURE

CIRCUS DILEMMA - DIVISION OF LIMITED RESOURCES

| Level | Description |
|---|---|
| 0 | Avoidance of dilemma |

e.g., Buy more tickets - even though reminded once that no more available.

| | |
|---|---|
| 1 | Recognition of situation but failure to fully recognize dilemma - Use one of remaining tickets and choose one child |

e.g., Parents and child go with one other child

| | |
|---|---|
| 2 | Recognition of situation but failure to fully recognize dilemma - Use both of remaining tickets and choose two children |

e.g., Parents and child go with two other friends

| | |
|---|---|
| 3 | Recognition of dilemma in terms of feelings of excluded persons but unable to generate alternative solution |

e.g., No one goes to avoid hurt feelings, argument, etc. but no alternative solution given. Variations on this theme are that parents go alone or that parents and child go alone with child but no friends.

| | |
|---|---|
| 4 | Recognition of dilemma in terms of feelings and makes effort at generating an alternative solution, although it is impractical |

e.g., One parent stays (for any reason) and the other parent goes with the children OR The child stays and the parents go with the friends OR The parents stay and the children go alone.

5 Recognition of dilemma and more successful alternative solution at satisfying feelings of all

e.g., Parents and child go with two other children and attempt made to satisfy the left-out child OR Parents and child go with one other child and attempt made to satisfy the two left-out children.

6 Recognition of dilemma and successful alternative made at satisfying all children equally; however, decision is unilateral

e.g., Donate or sell tickets and have a party instead with everyone involved.

7 Recognition of dilemma and alternative made at satisfying all children equally; however, decision is mutual, or agreed upon by all

e.g., Talk together with all the children and decide what to do, be it pulling names out of a hat, or selling tickets and having a party instead.

FRISBEE DILEMMA - ATTRIBUTION OF RESPONSIBILITY

| Level | Description |
|---|---|
| 0 | Avoidance of dilemma |
| e.g., Do nothing | |
| 1 | Complete transfer of responsibility to authority |
| e.g., Parent(s) clean up and pay alone | |
| 2 | Shared responsibility between one child and parent |
| e.g., One child and parent clean up and pay | |
| 3 | Complete responsibility by one child only |
| 4 | More children involved - Shared responsibility among two children and parent(s) |
| 5 | Complete responsibility by two children only |
| 6 | All children involved - Shared responsibility among three children and parent(s) |
| 7 | Complete responsibility by all children involved |

# Appendix H

## Preliminininary Analyses for Experiment 2

Statistical analyses were performed using the statistical software package SPSSx, unless otherwise stated. BMDP was used when SPSSx failed to give the appropriate statistical tests (e.g., Greenhouse-Geisser adjustment of degrees of freedom for the F-test in repeated measures anova).

Outliers Analysis and Treatment of Missing Data

Since further analyses were of between-group differences, data were analyzed for outliers within individual cells (Tabachnick and Fidell, 1983). For each of the eight cells created by classification by grade, sex, and friendship group, raw data were transformed to z-scores and then examined for extreme scores ($z = + 3.00$). One outlying value was found for the post-test score on the Circus story for a subject in the cell Grade 3-4 Girl Friends, with $z = -3.17$. The value was left unchanged due to the small absolute difference that would have been achieved by adjusting the score (6.00 would have been adjusted to 6.05). Fifteen missing data points distributed across six variables were replaced by the mean for that cell.

Normality Assumption

The assumption of normal distribution of the dependent variables was examined by testing the significance of the skewness value against the standard error for skewness, given by $s = \sqrt{6/N}$ (Tabachnick and Fidell, 1983, p. 79). For the Chumship Checklist, one variable, Total

Score for Nonfriends, showed significant positive skew at the $p < .05$ level. For the Friend Perception Task, three variables showed positive skew at the $p < .05$ or $p < .01$ levels: Perceived Similarity of Friend, Perceived Competence of Friend, and Perceived Competence of Self. One variable was positively skewed at the $p < .001$ level: Preference for Friend.

For the Interpersonal Problem-Solving Task, four variables were negatively skewed at the $p < .05$ or $p < .01$ level: Pretest Score for Circus Story, Pretest Score for Ski Story, Posttest Score for Ball Story, and Posttest Score for Ski Story. One variable was negatively skewed at the $p < .001$ level: Posttest Score for Circus Story. Despite the significant skew, it was decided not to transform the variables because with the relatively large sample size and with equal cell sizes, the test statistics used in the present study are said to be robust to violation of the normality assumption (Tabachnick and Fidell, 1983). Moreover, the difficulties of interpretation of transformed variables would outweigh the statistical benefits of transformation.

Homogeneity of Variance Assumptions

For analyses of the Chumship Checklist, the Friend Perception Task, the Interpersonal Problem-Solving Measure, and the qualitative analyses of interactions, violations of the univariate homogeneity of variance assumption were

tested using Cochran's C and the Bartlett-Box F statistics, and multivariate homogeneity of variance was tested using Box's M statistic. No variable on any of the three measures showed violation of these assumptions.

For the qualitative analyses of interactions, one variable, Conflict, showed violation of the univariate homogeneity of variance assumption using the Bartlett-Box F Statistic, $F$ (3,3160) = 3.82, $p$ =.01, but not using Cochran's C statistic, $C$ (11,4) = .52, n.s.. Given that the Bartlett-Box F statistic is highly sensitive to violations of the homogeneity of variance assumption, it was considered appropriate to use Cochran's C statistic and to assume nonviolation of the assumption.

Sphericity Assumption

Friend Perception Task. For the Grade X Sex repeated measures analysis of the competence items (self, friend, nonfriend), sphericity was tested using the Bartlett test. The test statistic was nonsignificant, indicating no violation of the sphericity assumption, such that it was valid to examine the univariate results of the repeated measures analysis.

Interpersonal Problem-Solving Measure. For the Grade X Sex X Story repeated measures analysis of variance, the Bartlett test showed violation of the sphericity assumption, with a test statistic of 12.49 with 3 d.f., $p < .01$. Although this test is very sensitive to violation of the

sphericity assumption, it was considered cautious to also examine and report the Greenhouse-Geisser adjusted F-test with the regular F-test (see Appendix I for ANOVA tables reporting this statistic). All tests for which the Greenhouse-Geisser statistic was used remained significant after the correction.

Analyses of School Differences

Subjects for Study 2 were drawn from three schools in Montreal, Montreal North, and Riviere des Prairies, Quebec. Prior to combining the data from the three schools, a series of ANOVAS was performed to ensure that scores on the measured variables did not differ by school. Results showed that two variables differed significantly by school: (1) Age, $F$ (2,88) = 4.62, $p < .05$, and (2) Parent Education, $F$ (2,88) = 11.54, $p < .001$. Scheffe post hoc analyses showed that for the variable Age, subjects in School 1 were older than subjects in Schools 2 and 3 (see Table H - 1). This is attributable to the fact that more Grade 4 children were taken from this school.

Parent Education was measured according to Hollingshead (1975). Scores for Mother Education and Father Education were collected separately and then, given a correlation of $r$ = .84 between them, were averaged to give the variable Parent Education. Scheffe post hoc tests showed that School 3 scored significantly higher than School 2 (means of 4.79 versus 3.32, respectively), reflecting SES differences in

the demographic regions in which the three schools are situated. According to Hollingshead (1975), a score of 3 represents a grade 10 education, a score of 4 represents a grade 11 education and a score of 5 represents a CEGEP education. Given that there were no significant differences between schools on any of the experimental variables, and since children from the three schools were equally represented in all of the cells, it was considered appropriate to combine the data from the three schools.

Table H - 1

Means and Standard Deviations for Age and Parent Education by School

| Group (*n*) | Age (*M*, *s.d.*) | Parent Education (*M*, *s.d.*) |
|---|---|---|
| Total (94) | 8.58 (1.42) | 4.13 (1.25) |
| School 1 (38) | 9.05 (1.44) | 3.93 (1.07) |
| School 2 (22) | 8.23 (1.50) | 3.32 ( .99) |
| School 3 (34) | 8.27 (1.24) | 4.79 (1.24) |

# Appendix I

## Anova Summary Tables for Experiment 2

Table I - 1

Analysis of Variance Summary Table for Chumship Checklist

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Groups | | | | | |
| Grade | 1.17 | 1 | 1.17 | .04 | .841 |
| Sex | 8.76 | 1 | 8.76 | .30 | .584 |
| G X S | 45.05 | 1 | 45.05 | 1.56 | .215 |
| Within Cells | 2660.73 | 92 | 28.92 | | |
| Within Groups | | | | | |
| Friendship Status | 2283.40 | 1 | 2283.40 | 87.30 | 0.000 |
| G X FS | 39.42 | 1 | 39.42 | 1.59 | .211 |
| S X FS | 47.01 | 1 | 47.01 | 1.89 | .172 |
| G X S X FS | 30.88 | 1 | 30.88 | 1.24 | .268 |
| Within Cells | 2283.40 | 92 | 24.82 | | |

Table I - 2

Analysis of Variance Summary Table for Perceived Similarity Ratings

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Groups | | | | | |
| Grade | 7.13 | 1 | 7.13 | .30 | .586 |
| Sex | 20.67 | 1 | 20.67 | .87 | .354 |
| G X S | 66.51 | 1 | 66.51 | 2.79 | .098 |
| Within Cells | 2194.44 | 92 | 23.85 | | |
| Within Groups | | | | | |
| Friendship Status | 399.63 | 1 | 399.63 | 12.30 | .001 |
| G X FS | 3.26 | 1 | 3.26 | .10 | .752 |
| S X FS | 16.92 | 1 | 16.92 | .52 | .472 |
| G X S X FS | .42 | 1 | .42 | .01 | .910 |
| Within Cells | 2989.27 | 92 | 32.49 | | |

Table I - 3

Anova Summary Table for Preference Ratings

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Groups | | | | | |
| Grade | 7.13 | 1 | 7.13 | .38 | .540 |
| Sex | 29.30 | 1 | 29.30 | 1.55 | .216 |
| G X S | 7.13 | 1 | 7.13 | .38 | .540 |
| Within Cells | 1737.19 | 92 | 18.88 | | |
| Within Groups | | | | | |
| Friendship Status | 3325.27 | 1 | 3325.27 | 30.57 | 0.000 |
| G X FS | 23.38 | 1 | 23.38 | .76 | .384 |
| S X FS | 1.17 | 1 | 1.17 | .04 | .845 |
| G X S X FS | 20.67 | 1 | 20.67 | .68 | .413 |
| Within Cells | 2812.27 | 92 | 30.57 | | |

Table I - 4

Anova Summary Table for Perceived Competence Ratings

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Groups | | | | | |
| Grade | 110.01 | 1 | 110.01 | 4.88 | .030 |
| Sex | 50.00 | 1 | 50.00 | 2.22 | .140 |
| G X S | 1.68 | 1 | 1.68 | .07 | .785 |
| Within Cells | 2072.47 | 92 | 22.53 | | |
| Within Groups | | | | | |
| Friendship Status | 1595.90 | 2 | 797.95 | 45.04 | 0.000 |
| G X FS | 17.88 | 2 | 8.94 | .50 | .605 |
| S X FS | 76.65 | 2 | 38.32 | 2.16 | .118 |
| G X S X FS | 8.88 | 2 | 4.44 | .25 | .779 |
| Within Cells | 3260.03 | 184 | 17.72 | | |

Table I - 5

Anova Summary Table for Circus Pretest Scores

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Grade | 22.04 | 1 | 22.04 | 10.18 | .002 |
| Sex | .04 | 1 | .04 | .02 | .890 |
| G X S | .67 | 1 | .67 | .31 | .580 |
| Within Cells | 199.25 | 92 | 2.17 | | |

Table I - 6

Anova Summary Table for Ski Pretest Scores

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Grade | 8.17 | 1 | 8.17 | 3.67 | .059 |
| Sex | 3.38 | 1 | 3.38 | 1.52 | .221 |
| G X S | .04 | 1 | .04 | .02 | .892 |
| Within Cells | 204.92 | 92 | 2.23 | | |

Table I - 7

Anova Summary Table for Frisbee Pretest Scores

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Grade | 5.51 | 1 | 5.51 | 1.60 | .209 |
| Sex | .84 | 1 | .84 | .25 | .622 |
| G X S | .84 | 1 | .84 | .25 | .622 |
| Within Cells | 316.54 | 92 | 3.44 | | |

Table I - 8

Anova Summary Table for Ball Pretest Scores

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Grade | 19.26 | 1 | 19.26 | 4.55 | .036 |
| Sex | 4.59 | 1 | 4.59 | 1.08 | .300 |
| G X S | .84 | 1 | .84 | .20 | .656 |
| Within Cells | 389.79 | 92 | 4.24 | | |

Table I - 9

Anova Summary Table for Analysis of Story Difficulty

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between Groups | | | | | |
| Grade | 51.04 | 1 | 51.04 | 10.42 | .002 |
| Sex | 5.51 | 1 | 5.51 | 1.12 | .292 |
| G X S | .38 | 1 | .38 | .08 | .783 |
| Error term | 450.81 | 92 | 4.90 | | |
| Within Groups | | | | | |
| Story | 36.51 | 3 | 12.17 | 5.09 | .002 |
| G-G adj. df = 2.57, 236.45 | | | | | .003 |
| H-F adj. df = 2.74, 251.76 | | | | | .003 |
| G X Story | 3.94 | 3 | 1.31 | .55 | .434 |
| S X Story | 3.34 | 3 | 1.11 | .47 | .524 |
| G X S X Story | 2.02 | 3 | .67 | .28 | .839 |
| Error term | 659.69 | 90 | 2.39 | | |

GGI Epsilon = 0.85

H-F Epsilon = 0.91

Table I - 10

Anova Summary Table for Discussed Story

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between-pairs | | | | | |
| Grade | 18.75 | 1 | 18.75 | 3.09 | .086 |
| Friend Group | 4.69 | 1 | 4.69 | .77 | .384 |
| G X FG | .33 | 1 | .33 | .05 | .816 |
| Error term | 266.71 | 44 | 6.06 | | |
| Within-pairs Time of testing Effect | | | | | |
| Time of testing | 11.02 | 1 | 11.02 | 7.43 | .009 |
| G X TT | 5.33 | 1 | 5.33 | 3.59 | .065 |
| FG X TT | 1.02 | 1 | 1.02 | .69 | .411 |
| G X FG X TT | .33 | 1 | .33 | .22 | .638 |
| Error term | 65.29 | 44 | 1.48 | | |
| Within-pairs Level of discusser Effect | | | | | |
| Level of discusser | 82.69 | 1 | 82.69 | 58.56 | .000 |
| G X LD | 1.33 | 1 | 1.33 | .94 | .336 |
| FG X LD | 2.52 | 1 | 2.52 | 1.79 | .188 |
| G X FG X LD | .33 | 1 | .33 | .24 | .629 |
| Error term | 62.13 | 44 | 1.41 | | |
| Within-pairs Time of testing by Level of discusser Effect | | | | | |
| TT X LD | 38.52 | 1 | 38.52 | 28.31 | .000 |
| G X TT X LD | 8.33 | 1 | 8.33 | 6.12 | .017 |
| FG X TT X LD | .19 | 1 | .19 | .14 | .712 |
| G X FG X TT X LD | .08 | 1 | .08 | .06 | .805 |
| Error term | 59.88 | 44 | 1.36 | | |

Table I - 11

Anova Summary Table for Discussed Story for Grades 1-2

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between-pairs | | | | | |
| Friend Group | 3.76 | 1 | 3.76 | .59 | .449 |
| Error term | 139.23 | 22 | 6.33 | | |
| Within-pairs Time of testing Effect | | | | | |
| Time of testing | .51 | 1 | .51 | .39 | .541 |
| FG X TT | .09 | 1 | .09 | .07 | .793 |
| Error term | 29.15 | 22 | 1.32 | | |
| Within-pairs Level of discusser Effect | | | | | |
| Level of discusser | 52.51 | 1 | 52.51 | 27.68 | .000 |
| FG X LD | .51 | 1 | .51 | .27 | .609 |
| Error term | 41.73 | 22 | 1.90 | | |
| Within-pairs Time of testing by Level of discusser Effect | | | | | |
| TT X LD | 5.51 | 1 | 5.51 | 2.89 | .103 |
| FG X TT X LD | .26 | 1 | .26 | .14 | .715 |
| Error term | 41.98 | 22 | 1.91 | | |

Table I - 12

Anova Summary Table for Discussed Story for Grades 3-4

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between-pairs | | | | | |
| Friend Group | 1.26 | 1 | 1.26 | .22 | .646 |
| Error term | 127.48 | 22 | 5.79 | | |
| Within-pairs Time of testing Effect | | | | | |
| Time of testing | 15.84 | 1 | 15.84 | 9.64 | .005 |
| FG X TT | 1.26 | 1 | 1.26 | .77 | .391 |
| Error term | 36.15 | 22 | 1.64 | | |
| Within-pairs Level of discusser Effect | | | | | |
| Level of discusser | 31.51 | 1 | 31.51 | 33.99 | .000 |
| FG X LD | 2.34 | 1 | 2.34 | 2.53 | .126 |
| Error term | 20.40 | 22 | 20.40 | | |
| Within-pairs Time of testing by Level of discusser Effect | | | | | |
| TT X LD | 41.34 | 1 | 41.34 | 50.83 | .000 |
| FG X TT X LD | .01 | 1 | .01 | .01 | .911 |
| Error term | 17.90 | 22 | .81 | | |

Table I - 13

Anova Summary Table for Nondiscussed Stories

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Between-pairs | | | | | |
| Grade | 37.63 | 1 | 37.63 | 17.89 | .000 |
| Friend Group | 1.63 | 1 | 1.63 | .77 | .384 |
| G X FG | .56 | 1 | .56 | .26 | .610 |
| Error term | 92.57 | 44 | 2.10 | | |
| Within-pairs Time of testing Effect | | | | | |
| Time of testing | 7.13 | 1 | 7.13 | 9.95 | .003 |
| G X TT | .01 | 1 | .01 | .01 | .932 |
| FG X TT | .03 | 1 | .03 | .04 | .843 |
| G X FG X TT | .21 | 1 | .21 | .29 | .592 |
| Error term | 31.54 | 44 | .72 | | |
| Within-pairs Level of discusser Effect | | | | | |
| Level of discusser | 12.51 | 1 | 12.51 | 6.74 | .013 |
| G X LD | 3.99 | 1 | 3.99 | 2.15 | .150 |
| FG X LD | .88 | 1 | .88 | .47 | .495 |
| G X FG X LD | .36 | 1 | .36 | .19 | .661 |
| Error term | 81.63 | 44 | 1.86 | | |
| Within-pairs Time of testing by Level of discusser Effect | | | | | |
| TT X LD | .25 | 1 | .25 | .41 | .525 |
| G X TT X LD | .10 | 1 | .10 | .16 | .693 |
| FG X TT X LD | .17 | 1 | .17 | .27 | .606 |
| G X FG X TT X LD | 1.28 | 1 | 1.28 | 2.06 | .159 |
| Error term | 27.34 | 44 | .62 | | |

Table I - 14

Anova Summary Table for Pre-post-followup Analysis for Discussed Story

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| Within-pairs Time of testing Effect | | | | | |
| Time of testing | 14.54 | 2 | 7.27 | 5.73 | .009 |
| Error term | 30.46 | 24 | 1.27 | | |
| Within-pairs Level of discusser Effect | | | | | |
| Level of discusser | 40.21 | 1 | 40.21 | 18.70 | .001 |
| Error term | 25.79 | 12 | 2.15 | | |
| Within-pairs Time of testing by Level of discusser Effect | | | | | |
| TT X LD | 19.56 | 2 | 9.78 | 5.17 | .014 |
| Error term | 45.44 | 24 | 1.89 | | |

Table I - 15

Anova Summary Table for Qualitative Analyses of Interactions

| Source | SS | df | MS | F | p |
|---|---|---|---|---|---|
| **Conflict** | | | | | |
| Grade | .20 | 1 | .20 | 1.10 | .300 |
| Friend Group | .95 | 1 | .95 | 5.20 | .028 |
| G X FG | .43 | 1 | .43 | 2.34 | .133 |
| Error term | 7.68 | 42 | .18 | | |
| **Total Duration** | | | | | |
| Grade | 7338.28 | 1 | 7338.28 | 1.51 | .226 |
| Friend Group | 1686.42 | 1 | 1686.42 | .35 | .559 |
| G X FG | 1186.41 | 1 | 1186.41 | .24 | .624 |
| Error term | 204384.12 | 42 | 4866.29 | | |
| **Communicative Symmetry/Affect** | | | | | |
| Grade | .13 | 1 | .13 | .04 | .840 |
| Friend Group | .11 | 1 | .11 | .03 | .854 |
| G X FG | .25 | 1 | .25 | .08 | .779 |
| Error term | 134.36 | 42 | 3.20 | | |
| **Task Focus/Collaboration** | | | | | |
| Grade | 3.35 | 1 | 3.35 | 1.79 | .188 |
| Friend Group | .04 | 1 | .04 | .02 | .892 |
| G X FG | .74 | 1 | .74 | .39 | .534 |
| Error term | 78.66 | 42 | 1.87 | | |

# Appendix J

## Correlations for Measures Used in Experiment 2

Table J - 1

Correlations between Popularity Ratings and the Degree of Friendship Nominations for Friends and Nonfriends (n = 94)

| Variable | Popularity of Nonfriend | Nomination of Friend | Nomination of Nonfriend |
|---|---|---|---|
| Popularity of Friend | .00 | .31* | .07 |
| Popularity of Nonfriend | -- | -.11 | .07 |
| Nomination of Friend | | -- | .04 |
| Nomination of Nonfriend | | | -- |

Bonferroni Family-Wise Alpha

* $p < .05$

Table J - 2

Summary of Multiple Regression Analyses of Grade Differences in Patterns of Correlations on the Friend Perception Task

| Dependent Variable | Predictor | F to enter | $R^2$ change | p |
|---|---|---|---|---|
| Prffrd | Comself | 13.01 | .12 | .000 |
| | Grade | .20 | .00 | .656 |
| | Comself X Grade | 4.71 | .04 | .033 |
| Prffrd | Comfrd | 6.68 | .07 | .011 |
| | Grade | .00 | .00 | .986 |
| | Comfrd X Grade | 3.87 | .04 | .052 |
| Prfnon | Comnon | 30.88 | .25 | .000 |
| | Grade | 1.86 | .01 | .176 |
| | Comnon X Grade | .12 | .00 | .730 |
| Prfnon | Simnon | 11.85 | .11 | .001 |
| | Grade | .57 | .01 | .451 |
| | Simnon X Grade | 4.79 | .04 | .031 |
| Comnon | Simnon | 6.21 | .06 | .014 |
| | Grade | .51 | .01 | .478 |
| | Simnon X Grade | 1.49 | .01 | .225 |

Variable Names

Simfrd - Similarity rating for Friend
Simnon - Similarity rating for Nonfriend
Prffrd - Preference rating for Friend
Prfnon - Preference rating for Nonfriend
Comfrd - Competence rating for Friend
Comnon - Competence rating for Nonfriend
Comself - Competence rating for Self

Table J - 3

Intercorrelations between Items in the Friend Perception Task (n = 96)

| | Simfrd | Prffrd | Comfrd | Simnon | Prfnon | Comnon | Comself |
|---|---|---|---|---|---|---|---|
| Simfrd | -- | .09 | .19 | -.14 | .00 | -.05 | .04 |
| Prffrd | | -- | .26 | -.23 | -.25 | -.14 | .35* |
| Comfrd | | | -- | .06 | .11 | .09 | .24 |
| Simnon | | | | -- | .33* | .25 | -.14 |
| Prfnon | | | | | -- | .50* | -.01 |
| Comnon | | | | | | -- | -.02 |
| Comself | | | | | | | -- |

Variable Names

Simfrd - Similarity rating for friend
Prffrd - Preference rating for friend
Comfrd - Competence rating for friend
Simnon - Similarity rating for nonfriend
Prfnon - Preference rating for nonfriend
Comnon - Competence rating for nonfriend
Comself - Competence rating for self

Bonferroni Family-Wise Alpha

* $p < .05$

Table J - 4

Intercorrelations between Items in the Friend Perception Task and Popularity Scores: Friend Targets (N = 96)

| Variable | Simfrd | Prffrd | Comfrd | Popfrd |
|---|---|---|---|---|
| Simfrd | -- | .09 | .19 | .06 |
| Prffrd | | -- | .26 | -.36* |
| Comfrd | | | -- | -.17 |
| Popfrd | | | | -- |

Variable Names

Simfrd - Similarity rating for friend
Prffrd - Preference rating for friend
Comfrd - Competence rating for friend
Popfrd - Popularity scores for friend

Bonferroni Family-Wise Alpha

* $p < .05$

Table J - 5

Intercorrelations between Items in the Friend Perception Task and Popularity Scores: Nonfriend Targets (N = 96)

| Variable | Simnon | Prfnon | Comnon | Popnon |
|---|---|---|---|---|
| Simnon | -- | .33* | .25 | -.23 |
| Prfnon | | -- | .50* | -.19 |
| Comnon | | | -- | -.33* |
| Popnon | | | | -- |

Variable Names

Simnon - Similarity rating for nonfriend
Prfnon - Preference rating for nonfriend
Comnon - Competence rating for nonfriend
Popnon - Popularity score for nonfriend

Bonferroni Family-Wise Alpha

* $p < .05$

Table J - 6

Intercorrelations between Qualitative Measures of Interaction between Friends versus Nonfriends (N = 45 pairs)

| Variable | Symm | Durtot | Durclo | Focus | Affect | Collab | Confl |
|---|---|---|---|---|---|---|---|
| Symm | -- | -.24 | -.33 | -.05 | .50* | .30 | .31 |
| Durtot | | -- | .88* | -.01 | -.15 | -.05 | -.05 |
| Durclo | | | -- | .04 | -.12 | -.04 | .02 |
| Focus | | | | -- | .03 | .59* | .25 |
| Affect | | | | | -- | .31 | .18 |
| Collab | | | | | | -- | .27 |
| Confl | | | | | | | -- |

Variable Names

Symm - Communicative Symmetry
Durtot - Total Duration of Interaction
Durclo - Duration of interaction to closure of discussion
Focus - Task Focus
Affect - Affective Tone
Collab - Collaboration
Confl - Conflict

Bonferroni Family-Wise Alpha

* $p < .05$

Table J - 7

Intercorrelations between Qualitative Measures of Interaction: Summed Variables

| Variable | Durtot | Symaff | Foccol | Confl |
|---|---|---|---|---|
| Durtot | -- | -.22 | -.03 | -.05 |
| Symaff | | -- | .20 | .28 |
| Foccol | | | -- | .28 |
| Confl | | | | -- |

Variable Names

Durtot - Total Duration of Interaction
Symaff - Sum of Communicative Symmetry and Affect
Foccol - Sum of Task Focus and Collaboration
Confl - Conflict

Bonferroni Family-Wise Alpha

* $p < .05$

# Appendix K

## Coding Scheme for Qualitative Analysis of Interactions Used in Experiment 2

January 2, 1989

Coding Scheme for Qualitative Analysis of Interactions

1. TOTAL DURATION OF INTERACTION: Time duration of interaction as beginning when testers leave room (door closes) and as ending when testers enter room or when children terminate interaction by going to get testers.

2. DURATION OF INTERACTION TO CLOSURE OF DISCUSSION: Time duration of interaction as beginning when testers leave room (door closes) and as ending when children announce tc each other that they have finished or when testers enter room.

3. COMMUNICATIVE EXCHANGE OR SYMMETRY

References: Newcomb and Brady (1982), Gottman (1983) on levels of involvement. Findings of friend studies are greater communicative symmetry by friends than by nonfriends. Cognitive conflict literature predicts that a minimum level of task mastery is necessary to engage in a discussion, thus across friendship group, a lack of communicative exchange may reflect a lack of understanding of the task.

FOR THIS VARIABLE, ONE RATING IS GIVEN FOR THE DURATION OF INTERACTION TO CLOSURE OF DISCUSSION SO AS NOT TO CONFOUND COMMUNICATIVE SYMMETRY WITH THE RHYTHM OF TURN-TAKING (LONGER VERSUS SHORTER TURNS OF SPEECH FOR EACH CHILD).

| Scale: | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | Complete Asymmetry (Unilateral) | | Partial Symmetry | | Complete Symmetry (Reciprocal) |

Definitions:

1 - Complete Asymmetry: Discussion is monopolized by one child, who spontaneously gives own opinions and tells the other child what to say. Other child does not speak spontaneously but only in response to leader's questions or directives.

2 - Complete Asymmetry to Partial Symmetry:

3 - Partial Symmetry: Leadership by one child without him/her monopolizing the discussion.

4 - Partial to Complete Symmetry:

5 - Complete Symmetry: Children are engaged in a reciprocal conversation with spontaneous turn-taking.

FOR THE FOLLOWING VARIABLES, RATINGS ARE MADE FOR 30-SECOND INTERVALS, FOR THE TOTAL DURATION OF THE INTERACTION. THE RATINGS FOR THE 30-SEC INTERVALS WILL BE AVERAGED IN ORDER TO OBTAIN A MORE RELIABLE MEASURE FOR EACH VARIABLE. AVERAGED RATINGS WILL LATER BE CALCULATED FOR (a) THE TOTAL DURATION OF THE INTERACTION and (b) FOR THE DURATION OF THE INTERACTION TO CLOSURE OF DISCUSSION. THE AVERAGED RATINGS FOR (b) WILL ENABLE US TO CONTROL FOR DIFFERENCES IN THE DATA OF CHILDREN WHO DID VERSUS DID NOT TERMINATE THE INTERACTION FOLLOWING CLOSURE OF THE DISCUSSION (e.g., most children terminated interaction whereas some sat and waited in silence. This silence would not mean the same thing as silence prior to closure of the discussion).

4. TASK FOCUS

References: Sharabany and Hertz-Lazarowitz (1981) who suggest that task-relevant behaviors are maximized and other social behaviors minimized for pairs of friends, for whom the relationship is already established. Friends will function to perform task, nonfriends are interfered with by need to establish social relationship. Also see Furman and Childs (1981, April) on stages of friendships.

| Scale: | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | Completely Off-task | Slightly | Moderately On-task | Mostly | Completely On-task |

Definitions:

1 - Completely Off-task: All off-task statements (e.g., pretend or irrelevant conversation) or silence for 25-30 seconds of the interval.

2 - Slightly On-task: 4-5 off-task statements or silence for 20-25 seconds of the interval.

3 - Moderately On-task: 2-3 off-task statements or silence for 10-20 seconds of the interval.

4 - Mostly On-task: 1 off-task statement or silence for 5-10 seconds of the interval.

5 - Completely On-task: No off-task statements and no silence for longer than 5 seconds of the interval.

Note: Meta-statements may be rated as either on-task or off-task. For example, on-task meta-statements include explanations of the task by one child to the other and statements of interest in the task (e.g., this is fun). Off-task meta-statements include judgments about the task which are intended to take the other child off task (e.g., this is stupid, let's do something else).

5. AFFECTIVE TONE

References: Foot, Chapman, and Smith (1977); Newcomb, Brady, and Hartup (1979); Newcomb and Brady (1982). Findings are that interactions between friends have a more positive affective tone than interactions between nonfriends. It is difficult to separate the children's response to the task from their response to being paired with a friend versus a non-friend. Hypothesize that being with a friend will help them feel more secure with the task?

| Scale: | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | Uncomfortable | | Neutral | | Comfortable |

This judgment must be made on the basis of the affective quality of the children's voices. Interpret laughter as uncomfortable, shy laughter versus positive, enjoyable laughter.

Definitions:

1 - Uncomfortable: Nervous, shy or otherwise uncomfortable affect in both children for the entire duration of the interval. May include nervous laughter.

2 - Uncomfortable to Neutral: Uncomfortable affect for part of the interaction by both children or for the entire duration of the interval by one child.

3 - Neutral: Affective engagement is low and neutral, with both children sounding uninvolved in or bored by the discussion (although they may still discuss).

4 - Neutral to Comfortable: Neutral affect for part of the interval by both children (warm up with time) or for the entire duration of the interval by one child.

5 - Comfortable: At ease and affectively involved in the interaction. Both children talk easily and may or may not laugh to express enjoyment.

6. COLLABORATIVE CO-CONSTRUCTION (Explanations, elaborations, questions for clarification, co-generation of alternative solutions)

References: Nelson and Aboud (1985) found more explanations and information-seeking in friends than in nonfriends, that was unrelated to cognitive growth. Sullivan (1953) predicts more collaborative co-construction in interactions of friends. Cognitive growth theorists (e.g., Mugny et al., 1984) predict that in addition to conflict (see 6.), collaboration will facilitate growth.

| Scale: | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | None | | Some | | Many |
| | | | | | Explanations |
| | | | | | Elaborations |
| | | | | Questions | for Clarification |
| | | | | Generation | of Alternatives |

Key: Listen for statements soliciting the ideas of the other (e.g., Qu'est-ce qu'on va faire la?) and additions to each others ideas (Oui, et ....).

Definitions:

1 - For both of the children, there are no explanations, elaborations of own answer, questions for clarification from other child, nor generation of alternative solutions. Children simply state their own answer and then decide about the best one without elaboration. They may talk about other things (e.g., relate the story), but they do not elaborate on solutions to the dilemma.

2 - There is one utterance such as described above in the speech of the child or children speaking during the interval.

3 - There are 2-3 utterances such as described above in the speech of the child or children speaking during the interval or one child does elaborate, explain, question, etc., to a high degree and the other child does not.

4 - Both children elaborate, explain, question, generate alternatives to a moderate degree (4-5 utterances such as described above in the speech of the child or children speaking during the interval).

5 - Both children elaborate, explain, question, generate alternatives to a high degree (> 5 utterances such as described above in the speech of the child or children speaking during the interval).

7. CONFLICTUAL OR CONFRONTATIVE CO-CONSTRUCTION (statements of disagreement or constructive criticism, questions implying criticism or challenge to other)

References: Nelson and Aboud (1985) found more criticism in friends than in nonfriends. Cognitive growth theorists predict that opposition and comparison of responses are necessary for cognitive restructuration and cognitive growth, without resolution by normalization or compliance by one partner.

| Scale: | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | None by both | | Some by one or both | | Many by both |

Key: Listen for statements of disagreement (Oui, mais ..., Je n'aime pas ton idee parce que ... )

Definitions:

1 - No utterances of disagreement, constructive criticism, or challenge by both children. Agreement reached without disagreement, either by one child adopting the other's answer without defending his/her own, or by the pair accepting a juxtaposition of answers (e.g., We are both right).

2 - There is one utterance such as described above in the speech of the child or children speaking during the interval.

3 - There are 2-3 utterances such as described above in the speech of the child or children speaking during the interval or one child does disagree, confront, challenge, etc. to a high degree and the other child does not.

4 - Both children disagree, criticize, challenge, etc. to a moderate degree during the interaction (4-5 utterances such as described above in the speech of the child or children speaking during the interval).

5 - Both children disagree, criticize, challenge, etc., to a high degree during the entire interaction (> 5 utterances such as described above in the speech of the child or children speaking during the interval).