Friendship in Normal and Socially Deviant Children

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ABSTRACT

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The present study examined the frequency of having a friend and the relationship of friendship status to popularity and behavior in a sample of francophone children in grades 4 through 7. The children were classified as aggressive, withdrawn, aggressive-withdrawn or nondeviant on the basis of a peer nomination sociometric. Friendship was defined as a reciprocated friendship nomination between two children, and popularity as the number of friendship nominations received. The main findings were (1) high correlations (.72 - .82) between numbers of friends and popularity scores, (2) that nondeviant and aggressive subjects had more reciprocal friends and were more popular than withdrawn and aggressive-withdrawn children, (3) that in aggressive-withdrawn children, having a friend was positively related, over and above the effects of popularity, to measures of involvement in aggressive interactions with peers, and (4) that in all classification groups of children, popularity scores were positively related to measures of the level of social involvement and motor activity. No differences in behavior between interactions with a friend versus a non-friend were found. The differences between the classification groups of children in friendship status and its relationship to popularity and behavior are discussed.

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Friendship in Normal and Socially Deviant Children

It is widely recognized that peer relations play an important role in the social, affective and cognitive development of the child. Piaget hypothesized that social interaction enhances the development of social cognitive skills, for example the use and negotiation of rules and the ability to take the role of another (Piaget, 1926). Hartup (1978) reviewed studies demonstrating that children are effective socialization agents with regard to each other: peer models and reinforcement by peers are useful instruments of behavior modification (Hartup and Lougee, 1975; Wahler, 1967) and peer tutors have succeeded in effecting motivational and cognitive changes in both younger and older children (Allen, 1976). Rough-and-tumble play among peers who are equal in cognitive ability and social skills promotes the acquisition of effective and controllable aggressive behavior (Harlow, 1969). Peer interaction is also linked to the development of moral reasoning (Keasey, 1971). Finally, it appears that to some extent, peer group attachments may serve a security function for the child, both during temporary separations from parents (Rubenstein and Howes, 1979) and in the permanent absence of a family relationship (Freud and Dann, 1951).

In the earlier research on peer relations, researchers focused on popularity or peer group status as the significant discriminative dimension relating to social skills. For example, Hartup, Glazer and Charlesworth (1967) found positive correlations between social

acceptance and the frequency of giving positive reinforcement to peers, and between social rejection and the giving of negative reinforcement. Gottman, Gonso and Rasmussen (1975) discriminated between popular and unpopular children on the basis of role-taking abilities and knowledge about how to make friends. Keasey (1971) found that children with higher scores in moral judgment were rated as more popular than those with lower levels of moral judgment.

In addition to popularity or social status, interest has recently focused on friendship as an important social relation. The theoretical significance of friendship is based on Sullivan's (1953) hypothesis that preadolescent "chumships" contribute to the development of social cognition and altruism. According to Sullivan, friendships between same-sex peers facilitate the development of concepts of sharing, mutuality, and sensitivity to another person's feelings, which the child applies not only with his friend but also in social encounters with other persons. Although some aspects of friendship such as empathy and cooperation overlap with social acceptance (Moore, 1967), Mannarino (1980) has maintained that the two concepts must be differentiated. Furman (1984) has similarily suggested that friendship and popularity may be overlapping but not synonymous concepts. In accordance with Sullivan's hypothesis, it has been empirically established that most friends are same-sex (Duck, 1975; Kandel, 1978). Sex differences have been found, however, in that boys are reported to have more extensive friendships and girls to have fewer but more intensive friendships (Eder and Hallinan,

1978).

Research examining the meaning of friendship for children is consistent with Sullivan's view in underlining reciprocity as an important aspect in distinguishing friendship from other social relations (Bigelow, 1977; Furman and Childs, 1981; Mannarino, 1980). There appear to be developmental changes in the elaborations of children's notions about reciprocity and its behavioral manifestations in their actual interpersonal interactions (Berndt, 1981, Bigelow and LaGaipa, 1975; Youniss, 1980; Youniss and Volpe, 1978); however, mutuality and sharing underlie friendship expectations at all ages. Younger children (3-8 years) tend to associate friendship with the sharing of material goods or cooperation in enjoyable activities. Older children (9-11 years) report that friendship requires the sharing of private thoughts and feelings, loyalty, commitment, common interest and equal treatment in their relations with each other. The transition to adolescence is accompanied by an expansion of the equity norm to include a sense that friends share identities, merging themselves into a unit of "We" instead of "I and You" (Youniss, 1980).

Despite the importance of reciprocity in friendship, there is inconsistency regarding the definition of friendship used in research studies. Early studies used frequency of interaction as an objective measure of the strength of a friendship (Challman, 1932; McCandless, Bilous and Bennett, 1961). Recent studies have defined and examined friendship in terms of acquaintance (Doyle, Connolly and Rivest,

1980; Furman and Childs, 1981), unilateral relationships measured as non-reciprocated friendship nominations by the subject (Berndt, 1981; Bigelow, 1977; Bigelow and LaGaipa, 1975; Peevers and Secord, 1973) and reciprocal relationships measured as reciprocal matching of friendship nominations by subjects (Berndt, 1981; Foot, Chapman and Smith, 1980; Hayes, Gershman and Bolin, 1980; McGuire and Weisz, 1982; Sharabany and Hertz-Lazarowitz, 1981). The advantage of including the aspect of reciprocity into an operational definition of friendship is that it eliminates the possibility that children name peers whom they would like to be their friend but with whom they have no actual friendship.

In spite of the definitional differences regarding friendship, however, researchers studying acquaintance, unilateral and reciprocal friendships report that friendship is beneficial to the child's social, affective and cognitive development. Fine (1981) has argued that friendship is a cultural institution for the transmission of knowledge and performance techniques. For example, close friendships provide an opportunity for the practice of pranks, activities which may contribute to socialize children by allowing them to explore the boundaries of "proper" social behavior and to gain social poise in stressful situations. In support of this hypothesis, Fine (1980) reported that of the seventy 12-year old partners named for four different kinds of pranks, 89% were close friends, 9% were friends and 2% were former friends of the namer.

Similarily, the friendship bond creates a setting in which the

child is able to explore modes of expressing aggression, sexual attitudes and behavior, and attitudes towards school or the family, topics not typically discussed within the parent-child relationship. Through the content of conversations and experiences with his friends, the preadolescent learns what is expected of him by his peers. Also, if a child performs some negatively sanctioned behavior, the disapproval by peers does not necessarily imply a derogation of the child himself because the action is seen as one specific behavior and not as a stable personality trait. Hollander (1958) talks about friends as having "idiosyncracy credits", which allow for the performance of a wide range of technically inappropriate behaviors without personal derogation.

Numerous research studies provide evidence for the beneficial effects of friendship on social interactions among children. Regarding the affective and communicative components of interactions, the results of studies with children ranging in age from infancy to preadolescence are consistent with the view that friendship enhances the emission of positive prosocial behaviors. In comparison with non-friends, pairs of friends exchange more mutual glances, smile, tease and laugh at each other more (Foot, Chapman and Smith, 1977; Schwartz, 1972), engage in more proximal activities by standing or sitting closer to one another (Aiello and Jones, 1971; Jones, 1971; Jones and Aiello, 1973; Smith, Foot and Chapman, 1977) or by touching each other (Langlois, Gottfried and Scay, 1973; Lewis, Young, Brooks and Michaelson, 1975). Friends are also more likely than strangers to

imitate each other and to engage in gesturing (Lewis et al., 1975), to make requests of each other and to express positive and negative feelings about each other's behavior (Furman and Childs, 1981).

In the domain of play activities, Doyle, Connolly and Rivest (1980) found that with a familiar peer, preschool children showed an increase in the overall amount of social interaction, the complexity of toy play and the frequency of dramatic play, and a decrease in passive watching and solitary play. Furman and Childs (1981) also found more complex play between friends in that acquainted pairs of third grade children engaged in more associative and cooperative play than did unacquainted children. In contrast, the unacquainted dyads disclosed more information about themselves. Furman and Childs (1981) suggest that disclosure of information might represent an earlier stage in the acquaintanceship process.

Studies on task-oriented behaviors reveal that although pairs of friends and non-friends do not differ in the outcome of task performance, for example a block-building task (Newcomb, Brady and Hartup, 1979), there are differences in the task process. Friends make more reference to issues of equity and mutual intent than non-friends (Newcomb and Brady, 1982; Newcomb et al., 1979), whereas non-friends are more likely to behave indifferently towards each other, performing the task as though they were alone, or to try to impress each other by showing off and acting competitively (Philip, 1940; Potashin, 1946). Berndt (1981) also found that friends in grade 4 prefer mutually satisfying outcomes rather than competitive

win-lose situations. Sharabany and Hertz-Lazarowitz (1981) reported that in a task-oriented situation, drawing on a single sheet of paper using paints and cuttings, pairs of friends (5-8 years) unexpectedly exhibited less sharing and less communicative behaviors, while they showed more task activity than pairs of non-friends. The authors suggest that friends might behave so as to maximize task relevant behaviors while performing a given task, while non-friends minimize task relevant behaviors and maximize social communicative behaviors. These results are consistent with Furman and Child's (1981) suggestion that disclosure and communicative behaviors occur at an early stage in the establishment of a friendship.

Overall, friendship appears to promote positive affective behaviors such as smiling, proximity and touching. It is also related to a greater complexity of play and to cooperative and mutually satisfying task-oriented behaviors. Such factors may not only make interaction with a friend pleasurable and rewarding for the child, but may also promote the learning of skills for effective prosocial interactions. This relationship was examined in a study by McGuire and Weisz (1982), which assessed the extent to which cognitive perspective-taking, affective perspective-taking and altruism in fifth and sixth grade children were related to two factors, friendship and popularity. Friendship was defined in terms of reciprocity, stability and high behavioral involvement, consistent with Sullivan's (1953) theory of preadolescent chumship. Popularity was operationally defined in terms of the number of nominations

received from classmates on two sociometric measures. Results were that children with friends were more likely than those without friends to display high levels of altruism and affective perspective-taking skill. In contrast, popularity was not significantly related to the measures of perspective-taking or altruism. Although no causal conclusions can be drawn, this study illustrates the association between friendship, as defined by Sullivan (1953), and social cognition and altruism. Moreover, it distinguishes the correlates of friendship from those of popularity, providing support for the contention that friendship and popularity are different dimensions (Mannarino, 1980). Unfortunately, the data from this study did not provide information as to whether children directed altruism specifically towards friends or more generally towards both friends and non-friends.

Consideration of the benefits of friendship to the child's affective, social and cognitive development becomes especially important when we consider that some children do not have friends. Gronlund (1959) reported that approximately 6% of third- through sixth-grade children in one school district were not nominated as friends by any children in their classroom and another 12% were nominated by only one classmate, as measured by a sociometric questionnaire. Hymel and Asher (1977) reported similar results: 11% of the children studied received no friendship nominations by peers and another 22% received only one. They attributed their higher percentages to methodological differences, in that their subjects

were limited to three peer nominations, a smaller number than in Gronlund's (1959) study, where subjects were allowed to nominate up to five classmates as friends.

Research evidence indicates that there are negative correlates to having few friends or to being ignored or rejected by one's peers. Unpopular children are more likely to be low achievers in school (Bonney, 1971) and to drop out of school (Ullmann, 1957) than their socially accepted peers. The correlates and potential consequences of low peer acceptance may also extend beyond academic problems. Poor peer adjustment is related to indices of behavior problems in adolescence and adulthood such as juvenile delinquancy (Roff, Sells and Golden, 1972) and "bad conduct" discharges from the military service (Roff, 1961). Poor peer relations in childhood are also predictive of emotional and mental-health problems in adulthood (Cowen, Pederson, Babigian, Izzo and Trost, 1973), adult schizophrenia (Strain, Cooke and Appolloni, 1976), neuroses (Roff, 1963) and psychoses (Kohn and Clausen, 1955; Roff, 1963). Cohen et al. (1973) reported that the best childhood predictor of adult mental health was poor peer ratings.

Research on the behavioral concomitants of low peer status has focused on two groups of children: those who are aggressive and disruptive, and those who are socially withdrawn or isolated. Aggressive, aversive, task-inappropriate and "negative" behaviors have frequently been correlated with social rejection (Dodge, Coie and Brakke, 1982; Gottman, 1977; Hartup, Glazer and Charlesworth,

1967; Vosk, Forehand, Parker and Rickard, 1982). Dodge (1983) found second-grade boys who were rejected in new groups of peers to engage in more inappropriate behavior and more physical aggression than non-rejected boys. Similarily, Coie and Kupersmidt (1983) found that fourth-grade boys who were rejected in their classroom setting were extremely active and aversive in a new play group situation, and were also rejected in that new group within three play sessions. These findings underline the causal role of aggressive and disruptive behaviors in determining social rejection.

In addition to aggression, social isolation or withdrawal has been studied in relation to peer status and social skills. This focus is based on the Piagetian hypothesis that peer interaction is the key to social development (Piaget, 1926; 1932). Gottman (1977) found children low on peer acceptance to be high on a set of shy, anxious and fearful behaviors which he called "hovering". Rubin (1982) found a sample of socially isolated preschool and kindergarten children to be less competent cognitively than normal and sociable children. These children elicited fewer communicative overtures from their playmates than normal and sociable groups of children, and were less successful in their social requests (Rubin and Borwick, in press). Hymel and Rubin (in press) reported significant correlations between social isolation and poor peer acceptance in children in grades 2 through 6, and moreover, that the relation between isolation and poor peer acceptance increased with age. Ledingham (1981) reported that children who were withdrawn (grade 4) or both aggressive and

withdrawn (grades 4 and 7) were rated as less likeable by their peers than their nondeviant classmates. In contrast, aggressive children were as well liked as nondeviant children. These findings suggest that children who do not often interact with their peers may lack skills for social interaction and may be at risk for social problems in adolescence and adulthood.

In summary, the research literature suggests a correlation between the performance of socially deviant behaviors, either aggression or withdrawal, and low peer status. It has been hypothesized that this association reflects a lack of social skills necessary for effective positive social interaction (Gottman, 1977; Hymel and Asher, 1977; Putallaz and Gottman, 1981). On the other hand, the social skill deficit shown by unpopular children may not only be the cause of unpopularity but at a step earlier in time, the consequence of earlier peer rejection, deprivation of relationships with friends and consequently the affective, social and cognitive benefits that friendship has been shown to have. Whether social skill deficits are a cause or a consequence of peer rejection or neglect, however, the unpopular child becomes locked in a vicious cycle where he lacks the social skills to enable him to establish and maintain positive social relations with peers, and in turn to benefit from these relations. Coie and Kupersmidt's (1983) study showing that children recreate the same level of peer status in new groups after only three play sessions is especially illustrative of the pervasiveness of maladaptive patterns of interaction.

The research on social skills described above has consistently used sociometric status or popularity as the criterion for distinguishing one group of children from another. With the exception of McGuire and Weisz (1982), researchers have not attempted to differentiate the quality of behavior performed by children on the basis of whether or not they have a friend and/or are interacting with a friend versus a non-friend. To the extent that the functions of friendship are related to peer status, it is important to examine the empirical relationships of these two concepts.

In addition, to the extent that friendship may be unique in influencing social development, it is also important to examine the differences in friendship between normal and socially deviant children. Friendship may be an indicator of relative psychological health in deviant children. Based on the expectations for social competence and prosocial behavior that children seem to place on their friends (Bigelow, 1977; Mannarino, 1980), however, it would be expected that chidren who do not often interact with peers or who behave deviantly will be less likely to have acquired the skills necessary for forming and maintaining a friendship, and would have fewer friends than their nondeviant peers. From the same perspective, consistent with Ledingham (1981), one would expect socially deviant children to be less popular than their nondeviant peers.

The present study examined the frequency of having a friend and the relationship of friendship status to popularity and behavior in a sample of preadolescent children previously classified as socially

deviant or nondeviant. The children were classified as aggressive, withdrawn, aggressive-withdrawn or nondeviant on the basis of a peer nomination sociometric, the Pupil Evaluation Inventory (Pekarik, Prinz, Liebert, Weintraub and Neale, 1976). Children with high scores on factors of aggression, withdrawal or both aggression and withdrawal were selected for study because of their increased risk for schizophrenia and other forms of psychopathology in adulthood (Ledingham, 1981). Peer ratings were used in the identification of the target groups because of their ability to predict maladjustment in adulthood and due to their sensitivity to differences in social adjustment during childhood (e.g., Cowen et al., 1976; Hartup et al., 1967, Roff and Sells, 1968).

Three issues related to friendship were investigated. First, children in the four classification groups were compared on numbers of friends and on popularity, defined as the number of friendship nominations received. Sex and age differences in numbers of friends and popularity, and differences in numbers of same-sex and cross-sex friendships were also examined. Based on the hypothesis that socially deviant children may be more likely to be ignored or rejected by their peers, it was predicted that (1) socially deviant children would have fewer friends than nondeviant children and (2) socially deviant children would be less popular than nondeviant children. It follows from the two above hypotheses, and from Furman's (1984) suggestion that friendship and popularity are overlapping but not synonymous concepts, that measures of friendship and popularity

would be moderately correlated. Finally, based on Sullivan's (1953) theory of same-sex "chumships" and on previous research studies, it was predicted that children in all groups would have more same-sex than cross-sex friendships, and that boys would have a greater number of friends than girls.

The second set of analyses examined the relationship of friendship status to behavioral interactions. Using coded, behavioral observations of videotaped schoolyard interactions, measures of friendship status and popularity were used in predicting several behavioral criteria. Based on Sullivan's (1953) hypothesis that skills learned with friends should generalize to interactions with both friends and non-friends, and on the hypothesis that having a friend may be an indicator of health in socially deviant children, it was predicted that children who have a reciprocal friend would display more positive social behaviors, such as proximity to peers, touching, and degree of social involvement (giving and receiving attention), than their classification group counterparts who have no reciprocal friend. In addition, based on the study by McGuire and Weisz (1982), it was expected that friendship status would have additional power over and above popularity in the prediction of behavior.

The third analysis examined the effects on behavior of interacting with a friend compared to a non-friend. For this analysis, only children with at least one reciprocal friend were included. Based on the studies of behavioral interactions between

friends and non-friends (Foot et al., 1978; Furman and Childs, 1981), it was expected that interactions between friends would be characterized by more proximity and a higher level of involvement (giving and receiving attention) than interactions between non-friends. Finally, based on Harlow's (1969) and Fine's (1981) suggestions that friendship may provide a setting for the learning of effective and controllable aggressive behaviors, it was predicted that higher levels of physical contact (touch, rough-and-tumble aggressive behavior) would be observed among friends than among non-friends.

Method

Subjects

As part of the High Risk Longitudinal Study, Centre for Research in Human Development, Concordia University, data were gathered from 1976 to 1983. For the first part of the study, the subjects were 864 children in grades 4 through 7, with n's of 399, 79, 24 and 362 at each grade respectively. Subjects were combined into two age-groups, grades 4 and 5 (n = 478) and grades 6 and 7 (n = 386), due to the relatively small numbers of subjects in grades 5 and 6. A breakdown of subjects by Pupil Evaluation Inventory (PEI) classification, sex and age is given in Table 1. All children were French speaking, attending French language schools in Montreal. French speaking subjects were selected for study because Francophones in Montreal constitute one of the most geographically stable groups in urban Canada (Statistics Canada, 1974). This study was part of a larger

Table 1

Sample frequencies in Part 1 of study by Pupil Evaluation Inventory (PEI) classification, sex and age (N = 864)

	PEI classification			
	Nondeviant	Aggressive	Withdrawn	Aggressive-Withdrawn
Boys				
Grade 4-5	128	32	33	38
Grade 6-7	117	25	37	14
Girls				
Grade 4-5	147	25	28	47
Grade 6-7	113	38	35	7
Total	505	120	130	106

longitudinal study of children at risk for schizophrenia and other forms of maladjustment in later life, which requires low attrition due to mobility for success in follow-up procedures (Ledingham, 1981).

For the second part of the study involving behavioral observations of children's playground interactions, a sub-set of the first sample was used. Subjects were 112 children in grades 4 through 6, enrolled in Ecole Notre Dame de Perpetuel Secours, Ville Emard, Quebec (School 1) and in Ecole Adelards DesRosiers, St. Leonard, Quebec (School 2). Data were collected during the academic years 1981-1982 and 1982-1983 for the two samples respectively. The socioeconomic status of the subjects was primarily lower middle class (Ville Emard) and middle class (St. Leonard). The three grades were combined due to the small numbers of children at each level. A breakdown of subjects by PEI classification, sex and school is given in Table 2.

In the third part of the study comparing subjects' behavior when interacting with a reciprocal friend versus a non-friend, the sample consisted of those children from the second study who had at least one reciprocal friend, and who were observed while interacting with both a friend and a non-friend. In addition, since these subjects were found to interact for a significantly greater proportion of coded time with same-sex than with opposite-sex friends, $\underline{M} = .127$ versus $\underline{M} = .008$, respectively, and non-friends, $\underline{M} = .188$ versus $\underline{M} = .055$, respectively, $\underline{F}\ (1,35) = 15.87$, $p<.001$, with only 5 subjects

Table 2

Sample frequencies in Part 2 of study by PEI classification, sex and school (N = 112)

	PEI classification			
	Nondeviant	Aggressive	Withdrawn	Aggressive-Withdrawn
Boys				
School 1	5	6	6	4
School 2	10	8	9	10
Girls				
School 1	6	5	5	4
School 2	11	7	7	9
Total	32	26	27	27

interacting with both opposite-sex friends and non-friends, the sample was defined as those subjects who interacted with both friends and non-friends of the same sex. This resulted in samples of 34 subjects for the analysis of one cluster of behaviors (physical contact) and 30 subjects for the analysis of a second cluster of behaviors (play and social involvement). The latter analysis had fewer subjects due to lack of interactions with certain partners for four subjects. Table 3 gives a breakdown of subjects used in this third set of analyses by PEI classification and sex.

Identification of the target sample . Subjects were chosen on the basis of their classification into one of four target groups: aggressive, withdrawn, aggressive-withdrawn or nondeviant control. To select subjects, a French translation of a peer nomination sociometric, the Pupil Evaluation Inventory (Pekarik, Prinz, Liebert, Weintraub and Neale, 1976) was used (see Appendix A). The inventory was administered to more than 4500 children in the Montreal area, of whom 864 were included in the present study.

The Pupil Evaluation Inventory (PEI) contains 35 items which load onto three factors: aggression, withdrawal and likeability. For this study, only the aggression and withdrawal factors were of concern. Overall, the items on the aggression factor relate to a global construct of aggression, including items such as "Those who can't sit still", "Those who get angry when things don't work out as they want", "Those who are mean and cruel to other children", and "Those who try to get others into trouble". These items suggest that

Table 3

Sample frequencies in Part 3 of study by PEI classification and sex

	PEI classification			
	Nondeviant	Aggressive	Withdrawn	Aggressive-Withdrawn
Contact Behavior (N = 34)				
Boys	6	8	4	3
Girls	5	3	4	1
Total	11	11	8	4
Play and Involvement Behaviors (N = 30)				
Boys	6	5	3	3
Girls	4	5	4	0
Total	10	10	7	3

the aggression factor may reflect a variety of forms of aggression including distrability, impulsivity, hostility, and indirect, controlled aggression. It does not include items identifying antisocial behaviors such as lying, stealing or cheating. The withdrawal factor includes items such as "Those who are not noticed much", "Those who are usually the last ones chosen to participate in group activities", "Those who often don't want to play", and "Those who are unhappy or sad". The items in the withdrawal factor suggest that it reflects a global construct of social isolation encompassing a variety of aspects such as neglect, rejection, withdrawal and loneliness.

To administer the PEI, children in each class were asked to nominate those boys and girls in the class who best fitted the description of each of the 35 items on the questionnaire. Boys and girls were rated on separate administrations, and for each item, children were allowed to nominate up to four classmates of each sex.

The total number of nominations received by each child was calculated separately for items loading on the aggression factor and the withdrawal factor. Raw scores for each factor were transformed using a square root transformation to reduce skew. They were then converted to $\underline{Z}$ scores for each sex within each class to remove the effects of age or sex in baseline rates of aggression and withdrawal, and the effect of differences in class size on total scores. In this manner, selection of target subjects took into account age, sex and classroom specific norms of behavior that would have been confounded

using raw scores.

To select subjects, those children who were at or above the 95th percentile on the aggression factor and below the 75th percentile on the withdrawal factor were designated as aggressive. Similarily, children at or above the 95th percentile on withdrawal and below the 75th percentile on aggression were designated as withdrawn. Those children at or above the 75th percentile on both aggression and withdrawal were designated as aggressive-withdrawn. Nondeviant subjects were chosen randomly from among those children below the 75th percentile on both aggression and withdrawal (Ledingham, 1981).

Identification of friendship choices . Children's friendship choices were assessed using Item 19 of the PEI ("Name those girls/boys who are your best friends"). This item loads on the likeability factor of the Pupil Evaluation Inventory and therefore was not used in the initial classification of target children into groups. All children in each class were asked to nominate up to four male and four female best friends from within the classroom.

The number of reciprocal friends was calculated for each target subject, a reciprocal friendship pair being defined as two children in the same class who nominated each other. The numbers of nominations made and received by each child (not necessarily reciprocated) were also computed as control variables. Popularity was defined as the total number of friendship nominations received by each child. Each of these variables was computed separately for same-sex and cross-sex peer nominations.

Behavioral Observations

The data were collected using videotaped samples of playground interactions. Prior to filming, two photographs were taken of every child in each class (both target and non-target children), dressed in spring and winter outdoor clothing. The photographs were used by the filmers for identification of the children on the playground.

During morning and afternoon recess breaks, research assistants, naive to the PEI classification of the children, filmed target subjects from a second storey classroom window. The camera used was a Sony Trinicon Colour Videocamera. Filmers worked in pairs, one as a spotter and the other as a filmer. Using photographs, the spotter identified a target child on the playground. The filmer filmed the child for approximately 2 minutes, 10 seconds, following the child as he or she moved on the playground. At the termination of the 2-minute filming period for one subject, the filmer filmed another target child previously identified by the spotter. The order of videotaping was determined by the order in which target children were spotted, although the number of samples was kept approximately equal among subjects in order to collect equivalent samples of winter and spring behavior. Approximately 8 minutes of videotaped samples (four 2-minute segments) of playground behavior were collected for each target child in the Ville Emard sample and about 20 minutes (ten 2-minute segments) were collected for each target child in the St. Leonard sample.

Behavioral Coding . The behavioral coding was done by six

graduate students and undergraduate research assistants who were naive to the PEI classification of the subjects. A detailed description of the behavioral codes and the coding procedure is given in Appendices B and C; in this paper, only a brief description will be given. A four-pass system was used for coding the behavioral observations into a MORE Observation Unit (Observational Systems, Seattle, WA). On the preliminary, unrecorded pass, the coder identified the target child and the context of the segment. During the first recorded pass, the coder scored the status of the target child as proximal to or engaged in play with no one, one, or more than one peer of the same or opposite sex. For the purposes of the present study, the variables were aggregated (summed) into three global measures of analysis: (1) the percentage of coded time spent alone, (2) the percentage of coded time spent proximal to others, and (3) the percentage of coded time spent in play. Intercorrelations among the single variables comprising the global measures of play and proximity to peers are given in Appendix D.

On the second pass, the coder recorded the contact categories, touch and aggression. Data from this pass included measures of the frequency per minute of touching and aggression (incited and retaliated slaps, punches and other) emitted by the target child and the peer. The derived set of "contact" variables used in the present study consisted of (1) target touches peer, (2) peer touches target, (3) target aggressive behaviors and (4) peer aggressive behaviors. Intercorrelations among the single variables comprising the measures

of target and peer aggressive behaviors are given in Appendix D.

On the fourth pass, coders recorded the level of motor activity of the target child and the level of social involvement of both the target and the peer. The categories of "target gives attention to peer", "target elicits attention from peer", "peer gives attention to target" and "target motor level" were rated as "high", "medium" or "low" every seven seconds (for 7-second intervals) on a rotating basis. A summary score was computed for each category by assigning a weight of 2 to ratings of "high", a weight of 1 to ratings of "medium" and a weight of 0 to ratings of "low". Ratings for each category were then multiplied by their respective weights, summed and divided by the total number of ratings multiplied by 2, in order to produce a score ranging from 0 to 1. These global ratings of level of social involvement and motor activity were used in the present study as variables for statistical analysis.

Reliability of Behavioral Coding . In order to reduce error variance and thus increase the reliability and validity of the data, each segment of videotape was coded for behavior by two randomly paired observers and then averaged. The average score, rather than the raw score from each observer was then used in the data analysis. Interobserver reliability for each behavioral code was computed using Pearson product-moment correlations. Interobserver correlations for the variables used in the present study are given in Table 4. It is to be noted that these correlations underestimate the actual reliability of the data due to the use of averaged rather than raw

Table 4

Pearson product-moment correlation coefficients measuring interobserver reliability

Duration Variables	
Play	.81
Proximity to peer	.86
Alone	.83
Frequency Variables	
Target touches peer	.60
Peer touches target	.64
Target aggression	.82
Peer aggression	.87
Rated Variables	
Target gives attention to peer	.74
Target elicits attention from peer	.72
Peer gives attention to target	.73
Target motor activity	.77

scores.

Primary Partner Coding . For the coding of the behavioral observations, the coder recorded whether the target was alone or with one or more peers. However, the identification of the peer was not determined. In order to examine behavioral differences in interactions with friends compared to non-friends, it was necessary to determine the identification of the primary partner as a friend or non-friend of the target child.

The primary partner coding was done by two undergraduate research assistants who were naive to the PEI classification and the friendship status of the subjects. The primary partner was scored at 28-second intervals for a total of approximately four intervals per 2-minute segment of videotape. This length of interval was judged as short enough to be sensitive to changes in a target child's primary partner. Twenty-eight-second intervals were also consistent with the intervals used for the level of involvement coding of the behavioral observation data. This facilitated the eventual merging of the two data sets.

Primary partner coding was executed in three steps for each 28-second interval:

(1) A decision was made as to the occurrence of a social interaction between the target child and one or more peers;

(2) The primary partner was identified by subject number;

(3) The friendship classification of the primary partner was recorded.

(1) Definition of Social Interaction: A social interaction was defined as at minimum one initiation-response sequence, that is an initiation which received a response within 10 seconds. An initiation was defined as any attempt to engage another child in social interaction. This referred to all behaviors within the behavioral code that were intended to elicit attention from a peer such as physical contact (touch or any form of aggression), physical gestures (beckoning, waving, throwing a ball to a peer) and verbal contact or a directed smile as when involved in conversaton.

A response was defined as any acknowledgement by the peer of the initiation of social contact directed towards him. All behaviors listed under initiations could also serve as responses. A response could also be indicated by any facial expression directed at the child who initiated contact, such as compliance with a command (e.g., heeding the beckoning), struggling (e.g., in response to attack) or acceptance of the offered object (e.g., catching the ball thrown).

If an initiation was made during an interval and was responded to within 10 seconds, but after the end of the interval, an interaction was scored for the interval in which the initiation was made. An interaction could be initiated by either the target child or the peer.

For each 28-second interval, if social interaction was judged to occur, the coder passed to Step 2 (Identification of the primary partner). If social interaction was judged not to occur, the coder scored "No Partner" for the interval.

(2) Identification of the primary partner: Once social interaction was judged to occur, the coder attempted to determine the identity of the primary partner. If the target child was interacting with only one peer the coder referred to the photographs of the children in order to match the image of the primary partner on the videotape with a photograph of that child. The difficulty of this task depended on the quality of the image on the videotape. If the coder succeeded in identifying the primary partner, she recorded his subject number and passed to the next interval. If the coder was unable to identify the primary partner, she scored "Uncodable Partner". The coder also scored "Uncodable Partner" if the primary partner was a child from a different class than the subject. This was because friendship status could not be determined for pairs of children in different classrooms, since friendship nominations were restricted to classmates only.

If the target child was interacting in a group with two or more peers, one of several decision criteria was used to identify the primary partner. The first criterion was based on the time spent with each peer in the group. Using a stopwatch, the coder determined with which peer the target was interacting for the greater part of the total social interaction for that interval. For example, although the target may have been with a group of several children, his initiative behaviors (e.g., touch, slap, throw ball to) were usually directed to and responded to by one peer in particular. This peer was considered the primary partner for that interval. Having determined the primary

partner in a group, the coder proceeded to match the video image with the photographs in order to identify the partner by subject number. If the main partner was uncodable, the coder identified and recorded the subject number of the second best partner, provided that the subject was interacting with that partner for at least one-third of the total social interaction for that interval.

Three alternative decision criteria were used if the subject was in a group with two or more peers and it was not possible to identify one primary partner on the basis of time spent in interaction:

(a) If only one peer in the group was codable, the coder recorded his/her subject number;

(b) If two or more peers were codable and they were interatting with the target child for only one 28-second interval, the coder chose the peer who was temporally the first to begin interacting with the target child;

(c) If two or more peers were codable and they were interacting with the target child for more than one 28-second interval (e.g., Chinese jump rope), the coder divided the intervals equally among the peers. The subject number of the peer who was temporally the first to begin interacting with the target child was coded for the first interval and the subject number of the second peer was coded for the second interval.

Interrater reliability was verified for decisions regarding the occurrence or non-occurrence of social interaction and the choice and identification of the primary partner. The co-observer was trained on

practice tapes until 80% agreement was reached. Interrater reliability was monitored throughout coding for 15% of the tapes, calculated using the equation:

$$\frac{\text{Agreements}}{\text{Agreements + Disagreements.}}$$

The total percentage agreement was 80.4%. Thirty-six percent of the disagreements concerned the occurrence versus non-occurrence of social interaction, and 64% concerned the correct identification of the primary partner. Segments of videotape on which there was disagreement were recoded on the basis of a group decision.

(3) Friendship classification of the primary partner: The friendship status of all subjects and their classmates was calculated on the basis of friendship nominations on the Pupil Evaluation Inventory. There were four types of friendship classification:

(a) If the target child nominated the primary partner and the primary partner also nominated the target child, the partner was classified as a "Reciprocal Friend";

(b) If the target child nominated the primary partner, but the primary partner did not nominate the target child, the partner was classified as a "Nomination Made";

(c) If the target child did not nominate the primary partner, but the primary partner did nominate the target child, the partner was classified as a "Nomination Received";

(d) If the target child did not nominate the primary partner and the primary partner also did not nominate the target child, the partner

was classified as a "Non-Friend".

Due to the small sample size and to the conceptual importance of the comparison between subjects' behavior with reciprocal friends versus non-friends over other comparisons, final analyses were restricted to subjects' behaviors while interacting with a reciprocal friend versus a non-friend.

The primary partner data was recorded on paper and later entered into a "Primary Partner" computer file. The friendship classifications for all subjects and their classmates were also stored in a separate "Friends" reference file. By using a computer program to merge these two files with the behavioral observation data file, it was possible to extract information about the friendship status of the peer with whom the target child was interacting when each behavior was performed.

Results

Each of the three issues addressed in this study was analyzed using a separate set of statistical procedures. Results of each set of analyses are presented.

Numbers of Friends and Popularity in Groups of Socially Deviant and Nondeviant Children

In order to assess numbers of friends and popularity in the groups of socially deviant and nondeviant children, a multivariate analysis of variance (MANOVA) was conducted on three dependent variables: number of reciprocal friends, number of nominations

received and number of nominations made. PEI classification, grade and sex were entered as between-group factors and sex of the nominated peer was entered as a within-subject factor.

Effects of classification . There was a significant multivariate F for PEI classification, F (9,2059.09) = 8.70, $p<.001$. Effects of PEI classification were significant for all three dependent variables: numbers of reciprocal friends, F (3,848) = 20.00, $p<.001$; numbers of nominations received F (3,848) = 22.38, $p<.001$; and numbers of nominations made, F (3,848) = 4.63, $p<.05$. Scheffe post-hoc analyses showed that nondeviant and aggressive children in both age-groups had more reciprocal friends and received more nominations than withdrawn and aggressive-withdrawn children, $p<.01$. Withdrawn children tended to make fewer nominations than the three other classification groups, $p<.10$. Table 5 gives the mean numbers of reciprocal friends, nominations received and nominations made for each classification group in the two age-groups.

Grade and sex differences . There was a significant main effect of grade, multivariate F (3,846) = 15.38, $p<.001$. Univariate analyses revealed that subjects in grade 6-7 had more reciprocal friends than subjects in grade 4-5, means 1.58 vs. 1.33, F (1,848) = 8.30, $p<.001$. On the other hand, subjects in grades 4-5 made more friendship nominations than subjects in grades 6-7, means 4.47 vs. 3.78, F (1,848) = 13.74, $p<.001$. There were no significant grade differences in nominations received. There were also no significant effects of sex, multivariate F (3,846) = 1.37, n.s..

Table 5

Mean numbers of reciprocal friends, nominations received and nominations made for each classification group in the two age-groups (*M*, *SD*)

	Nondeviant	Aggressive	Withdrawn	Aggressive-Withdrawn
Reciprocal Friends				
Grade 4-5	1.65(1.45)	1.49(1.31)	0.89(0.98)	0.52(0.84)
Grade 6-7	1.68(1.28)	2.14(1.44)	0.85(1.10)	1.29(0.96)
Nominations Received				
Grade 4-5	4.27(3.55)	3.70(2.76)	2.36(2.18)	1.41(1.46)
Grade 6-7	3.53(2.62)	4.51(2.77)	1.93(2.12)	2.19(1.99)
Nominations Made				
Grade 4-5	4.53(1.77)	4.72(1.95)	4.23(1.70)	4.28(2.10)
Grade 6-7	3.86(1.88)	4.30(1.77)	3.03(2.06)	3.85(1.93)

Same-sex and cross-sex friendships . There was a highly significant main effect of sex of nominated peer, multivariate F (3,846) = 81.94, $p<.0001$. Univariate analyses showed that all classifications of children in both age-groups had more same-sex than cross-sex reciprocal friends, F (1, 848) = 166.39, $p<.0001$. They also received more nominations from same-sex than cross-sex peers, F (1,848) = 65.13, $p<.0001$, and made more same-sex than cross-sex friendship nominations, F (1,848) = 170.26, $p<.0001$.

There was also a significant interaction between sex of nominated peer and PEI classification, multivariate F (9,2059.09) = 4.04, $p<.001$. Univariate analyses revealed that the interaction was significant for all three dependent measures: numbers of reciprocal friends, F (3,848) = 8.19, $p<.001$, nominations received, F (3,848) = 3.57, $p<.05$, and nominations made, F (3,848) = 4.37, $p<.01$. Scheffe post-hoc analyses of these interactions showed that the same-sex bias in numbers of reciprocal friends was significant for nondeviant, aggressive, and withdrawn children, $p<.001$, and for aggressive-withdrawn children, $p<.01$. On numbers of nominations received, nondeviant, aggressive and withdrawn children received significantly more same-sex than cross-sex nominations, $p<.01$. Aggressive-withdrawn children also tended to receive more same-sex nominations, however this difference did not reach significance at the .05 level. The same-sex bias on numbers of nominations made was significant for nondeviant, aggressive and withdrawn children, $p<.001$, and for aggressive-withdrawn children, $p<.01$. Mean numbers of

same-sex and cross-sex friends for each PEI classification group are given in Table 6.

Friendship and popularity . In order to examine the degree of empirical relationship between friendship and popularity, Pearson correlations were computed between the number of reciprocal friends and the number of nominations received. Correlations for grade 4-5 and grade 6-7 were .82 and .72, respectively, $p<.01$, indicating that a significant amount of variance was shared between the two measures.

In order to examine group differences in numbers of friends independent of nominations received, that is, to establish whether the friendship variable had a relationship with PEI classification independent of popularity, groups were equated for the mean number of nominations received and analyses of variance on numbers of reciprocal friends were conducted. In this analysis, classification groups no longer differed significantly in the number of reciprocal friends (see Table 7).

For the equated groups, however, correlations between the number of reciprocal friends and the number of nominations received for the two age-groups were still significant, being .72 and .64, respectively, $p<.01$.

Summary . The multivariate analyses of variance on numbers of friends and popularity revealed three main findings: (1) With respect to PEI classification, nondeviant and aggressive children had more reciprocal friends, and received more friendship nominations, than withdrawn and aggressive-withdrawn children; (2) Age differences were

Table 6

Mean numbers of same-sex and cross-sex reciprocal friends, nominations received and nominations made for each classification group (*M*, *SD*)

	Nondeviant	Aggressive	Withdrawn	Aggressive-Withdrawn
Reciprocal Friends				
Same-sex	1.29(1.02)	1.28(1.02)	0.68(0.87)	0.53(0.78)
Opposite-sex	0.37(0.71)	0.56(0.85)	0.19(0.48)	0.14(0.38)
Nominations Received				
Same-sex	2.52(1.90)	2.41(1.66)	1.41(1.47)	1.03(1.13)
Opposite-sex	1.42(1.91)	1.72(1.76)	0.72(1.22)	0.54(0.97)
Nominations Made				
Same-sex	2.72(1.08)	2.63(1.17)	2.35(1.21)	2.38(1.24)
Opposite-sex	1.51(1.32)	1.88(1.25)	1.24(1.33)	1.82(1.32)

Table 7

Mean numbers of reciprocal friends for classification groups equated for numbers of nominations received (*M*, *SD*)

	Nondeviant	Aggressive	Withdrawn	Aggressive-Withdrawn	*F*
Grade 4-5					
N=224	0.89(0.96)	1.00(0.94)	0.84(0.93)	0.78(1.00)	0.345 n.s.
Grade 6-7					
N=255	1.26(0.90)	1.38(0.94)	1.00(1.16)	1.29(0.85)	1.267 n.s.

that children in grade 6-7 had more reciprocal friends than children in grade 4-5, although children in the younger age-group made more friendship nominations; and (3) With one exception, all groups of subjects showed a significant same-sex bias in numbers of reciprocal friends, nominations received and nominations received. The exception was that aggressive-withdrawn children did not receive significantly more same-sex than cross-sex nominations, although the difference was in the expected direction.

Pearson correlations were used to examine the empirical relationship between numbers of friends and popularity (nominations received). Correlations for grade 4-5 and grade 6-7 were .82 and .72, respectively, $p<.01$, indicating that the two measures were highly correlated.

Prediction of Behavior by Numbers of Friends and Popularity

Multiple regression analyses were used to assess the strength of friendship status and popularity in the prediction of behavior. Dependent variables were the eleven behavioral measures described above. Table 8 gives the mean and standard deviation for each measure across PEI classification, sex and school.

The predictor variables of interest were friendship status and the number of nominations received (popularity). Friendship status was dichotomized and coded as a dummy variable in order to compare the behavior of subjects who had zero or one reciprocal friend to the behavior of subjects who had two or more reciprocal friends. The decision to dichotomize friendship status in this way was based on

Table 8

Mean scores and standard deviations for each dependent variable across PEI classification, sex and school (N = 112)

Duration variables	M	SD
Play	.560	.209
Proximity to peer	.306	.184
Alone	.122	.082
Frequency Variables		
Target touches peer	1.177	.524
Peer touches target	1.052	.418
Target Aggression	.746	.654
Peer Aggression	.662	.561
Rated Variables		
Target gives attention to peer	.825	.130
Target elicits attention from peer	.630	.126
Peer gives attention to target	.339	.141
Target motor activity	.447	.102

the calculation that the mean number of reciprocal friends by chance is .833, given a mean number of three same-sex nominations and one opposite-sex nomination in a group of 26 classmates. By dichotomizing friendship status as zero or one versus two or more friends, it was possible to compare the behavior of children for whom the probability of having a friend was greater than chance, to the behavior of children who had no friend or for whom the probability of having a friend was equal to chance.

In order to increase the number of subjects in the analysis, subjects were combined across levels of PEI classification, sex and school, which were used as covariates in the regression analyses. This model requires that the slope of the regression line be homogeneous across different levels of the covaried variables (Kleinbaum and Kupper, 1978). This assumption was tested in a preliminary, stepwise regression analysis, which assessed the significance of the two-way interactions of three variables (PEI classification, sex and school, coded as dummy variables) with friendship status and the number of nominations received. Interaction terms which were significant in this analysis were then included in the regression analyses as predictor variables. The interaction terms used and variables of concern included the following: Friendship status by PEI classification for Target touches peer, Peer gives attention to target, Target aggression and Peer aggression; Friendship status by sex for Target aggression; Nominations received by PEI classification for Peer touches target and Peer aggression;

and Nominations received by school for Target touches peer.

The regression analyses compared the differential predictive power of friendship status and nominations received after the effects of school, sex and PEI classification had been covaried out. This was achieved by forcing school, sex and PEI classification into the regression equation in a hierarchical order, followed by the stepwise entry of friendship status, nominations received and the interaction variables.

Effects of Friendship Status . Once the effects of school, sex and PEI classification had been removed, friendship status was not entered into the regression equation as a significant predictor for any dependent variable, indicating that it was not significantly related to the behavioral measures. The interaction between friendship status and PEI classification was a significant predictor for four dependent measures, however: Target touches peer, Target aggression, Peer aggression, and Peer gives attention to target. The interaction between friendship status and sex was also a significant predictor for the measure Target aggression (see Table 9).

In order to understand the meaning of the interaction between friendship status and PEI classification, regression analyses were conducted separately for each PEI classification group, for those variables in which the interaction was significant. School and sex were forced into the equation in a hierarchical order, followed by the stepwise entry of friendship status, nominations received, and where appropriate, other interaction variables. Results were that for

Table 9

Summary of multiple regression results for the interactions of friendship status by PEI classification and friendship status by sex (N=112)

	F to enter	Change in R^2
	Friendship status by PEI classification	
Target touches peer	10.922**	.069
Target aggression	3.961*	.023
Peer aggression	7.024**	.051
Peer gives attention to target	7.495**	.057
	Friendship status by sex	
Target aggression	14.643**	.088

* $p < .05$

** $p < .01$

three of the four measures where friendship status interacted significantly with PEI classification, Target touches peer, Peer aggression and Peer gives attention to target, friendship status was a significant predictor of behavior for one of the four PEI classification groups, although it did not significantly discriminate behavior in the remaining groups (see Table 10). Friendship status was a positive predictor of the measure Target touches peer for the aggressive group, accounting for 25.7% of the variance. This result indicates that aggressive subjects who have a friend touch their peers more frequently than aggressive subjects who do not have a friend. For the measures Peer gives attention to target and Peer aggression, friendship status was a positive predictor for the aggressive-withdrawn group, accounting for 20.8% and 12.7% of the variance in each measure, respectively. These results indicate that aggressive-withdrawn subjects who have a friend receive more attention from their peers and are more frequently aggressed against by their peers than their classification group counterparts who do not have a friend.

For the measure Target aggression, friendship status was not entered as a significant predictor for any of the four classification groups. For the aggressive, aggressive-withdrawn and nondeviant groups, however, the interaction between friendship status and sex was significant (see Table 11). In order to break down this interaction, and at the same time to explore the significant two-way interaction of friendship status by sex for this variable, regression

Table 10

Summary of multiple regression results for friendship status, within each PEI classification group

	F to enter	Change in R^2
	Target touches peer	
Aggressive	8.344**	.257
Withdrawn	.134	.003
Aggressive-Withdrawn	.368	.013
Nondeviant	.113	.003
	Peer gives attention to target	
Aggressive	2.443	.096
Withdrawn	.041	.002
Aggressive-Withdrawn	6.225*	.208
Nondeviant	.113	.003
	Peer aggression	
Aggressive	.234	.010
Withdrawn	.101	.004
Aggressive-Withdrawn	5.654*	.127
Nondeviant	3.889	.089

* $p < .05$

** $p < .01$

Table 11

Summary of multiple regression results for friendship status and friendship status by sex for the measure Target aggression, within each PEI classification group

	F to enter	Change in R^2
	Friendship status	
Aggressive	.233	.007
Withdrawn	.056	.002
Aggressive-Withdrawn	.413	.010
Nondeviant	.170	.003
	Friendship status by sex	
Aggressive	5.504*	.167
Withdrawn	2.984	.084
Aggressive-Withdrawn	11.310**	.261
Nondeviant	12.760**	.204

* $p < .05$

** $p < .01$

analyses were conducted within each sex for each of the three classification groups for which the interaction was significant. School was forced into the regression equation, followed by the stepwise entry of friendship status and nominations received. Results were that friendship status positively predicted Target aggression for aggressive-withdrawn males only, F to enter = 7.617, $p<.05$, Change in R = .38. This result indicates that in aggressive-withdrawn males, having a friend is strongly related to producing aggressive behaviors.

Effects of Friendship Status Over and Above Popularity . Given that friendship status is highly correlated with the number of nominations received, r = .69, $p<.001$, the effect of friendship status was examined, once the effects of nominations received had been removed, for those variables where friendship status had been significant. The analyses were conducted within the PEI classification group for which a significant effect had been shown by forcing school, sex and nominations received into the regression equation in a hierarchical order, followed by the stepwise entry of friendship status, and where appropriate, other significant interaction variables.

Results are given in Table 12. For the measure Target touches peer, in the aggressive group, friendship status did not remain a significant predictor of behavior once the effects of nominations received had been removed. For the measures Peer gives attention to target and Peer aggression, in the aggressive-withdrawn group,

Table 12

Summary of multiple regression results for friendship status when entered after nominations received into the regression equation

	F to enter	Change in R^2
Target touches peer - Aggressive Group (n=26)		
Nominations received	4.931*	.106
Friendship status	1.168	.036
Peer gives attention to target-Aggressive-Withdrawn group (n=27)		
Nominations received	1.234	.050
Friendship status	4.541*	.159
Peer Aggression - Aggressive-Withdrawn Group (n=27)		
Nominations received	.028	.001
Friendship status	9.130**	.189
Target Aggression- Aggressive-Withdrawn Males (n=14)		
Nominations received	2.198	.045
Friendship status	9.629*	.428

* $p < .05$

** $p < .01$

friendship status remained a significant predictor of behavior, however, accounting for 15.9% and 18.9% of the variance in the two measures respectively. For the measure Target aggression in aggressive-withdrawn males, friendship status also remained a strong predictor, accounting for 42.8% of the variance.

Effects of Popularity . Once the effects of school, sex and PEI classification had been removed, nominations received was entered as the next significant predictor for four dependent variables: Peer touches target, Target gives attention to peer, Target elicits attention from peer, and Target motor activity (see Table 13). Examination of the column in Table 13, "Change in R ", shows that addition of nominations received into the regression equation produced a small but significant change in the explained variance.

There was a significant interaction effect between nominations received and PEI classification, entered stepwise into the equation following friendship status, for the measure Peer aggression, F to enter = 4.850, $p<.05$, Change in R = .034. In order to understand the meaning of this interaction, regression analyses were performed separately within each PEI classification group. School and sex were forced into the regression equation, followed by the stepwise entry of friendship status and nominations received. Results were that nominations received approached significance as a negative predictor of behavior for the aggressive-withdrawn group only, F to enter = 5,653, $p<.10$, Change in R = .062. This result indicates that in the aggressive-withdrawn group, children who receive a greater number

Table 13

Summary of multiple regression results for nominations received when entered as significant into the regression equation (N = 112)

	F to enter	Change in R^2
Peer touches target	5.385*	.069
Target gives attention to peer	5.506*	.034
Target elicits attention from peer	4.082*	.025
Target motor activity	6.160*	.043

* $p < .05$

of friendship nominations tend to be aggressed against by their peers less frequently than children who receive fewer friendship nominations.

There was also a significant interaction effect between nominations received and school for the measure Target touches peer. The results of a follow-up, within school regression analysis were that nominations received was a significant predictor of the measure Target touches peer for School 2 only, F to enter = 13.648, $p<.001$, Change in R = .146. Given that the effects of school are not the focus of the present study, this result is not discussed in this paper.

Effects of Popularity Over and Above Friendship Status . Given the high correlation between nominations received and friendship status, r = .69, $p<.001$, it was examined whether nominations received accounted for a significant portion of the variance over and above friendship status, in the dependent measures for which it was entered first. This was achieved by forcing school, sex, PEI classification, and friendship status into the regression equation in a hierarchical order, followed by the stepwise entry of nominations received, and where appropriate, other significant interaction variables.

Results are given in Table 14. The values of " F to enter" and "Change in R " show that following the forced entry of friendship status into the equation, nominations received continued to account for a small but significant portion of the variance in the dependent

Table 14

Summary of multiple regression results for nominations received when entered after friendship status into the regression equation (N = 112)

	F to enter	Change in R^2
Peer touches target	1.807 n.s.	.015
Target gives attention to peer	4.376*	.028
Target elicits attention from peer	.899 n.s.	.005
Target motor activity	5.661*	.040

* $p < .05$

measures Target gives attention to peer and Target motor activity. Nominations received failed to remain a significant predictor for the two remaining measures, Peer touches target and Target elicits attention from peer. Finally, for School 2, nominations received remained a significant predictor for the measure Target touches peer, F to enter = 7.279, $p<.01$, Change in R = .080.

Summary . The multiple regression analyses revealed significant relationships between friendship status and behavior in two PEI classification groups of children. In the aggressive-withdrawn group, subjects who have a friend received more attention from their peers and were more frequently aggressed against by their peers than subjects who do not have a friend. In addition, aggressive-withdrawn males who have a friend were found to produce more aggressive behaviors than aggressive-withdrawn males who do not have a friend. These relationships remained significant after the effects of nominations received had been removed, indicating that in aggressive-withdrawn children, having a friend is related over and above the effects of popularity to involvement in aggressive interactions.

In the aggressive group, having a friend was significantly related to more touching of peers. This relationship did not remain significant once the effects of nominations received had been removed, however, indicating that friendship status is not related over and above the effects of popularity to touching of peers.

The multiple regression analyses also revealed a modest but

significant positive relationship, in all PEI classification groups of children, between popularity (nominations received) and four measures of behavior: Target gives attention to peer, Target elicits attention from peer, Target motor activity, and Peer touches target. Once the effects of friendship status had been removed, nominations received remained significantly related to two of the four measures, Target gives attention to peer and Target motor activity, indicating that popularity is related over and above the effects of friendship status to giving attention to peers and to physical activity. For the two remaining variables, Target elicits attention from peer and Peer touches target, nominations received did not remain significant once the effects of friendship status had been removed, indicating that popularity is not related over and above the effects of friendship status to eliciting attention from peers and to touching by peers of target.

Comparison of Behavioral Interactions with Friends Versus with Non-Friends

Multivariate analyses of variance (MANOVA) were used to compare subjects' behavior when interacting with a friend versus a non-friend. Due to the limited number of subjects, it was impossible to conduct one single analysis using school, sex and PEI classification as between-group factors and peer friendship status as a within-subject factor. Therefore, subjects were combined across school and analyses were conducted separately for (1) PEI classification by peer friendship status and (2) sex by peer

friendship status. These analyses were chosen to capture the interactions considered to have greatest conceptual significance. The mean duration spent by subjects with friend and non-friend partners, on which the analyses are based, are given in Table 15.

Dependent variables in the analyses were two sets of behavioral measures: (1) six contact behaviors, including the frequency per minute of Target touches peer, Peer touches target, Target incites aggression, Target retaliates aggression, Peer incites aggression, Peer retaliates aggression, and (2) six measures of play and social involvement, including the percentage of time spent in play and proximal to a partner, Target gives attention to peer, Target elicits attention from peer, Peer gives attention to target, and Target motor activity.

Effects on measures of physical contact . There were no significant effects of peer friendship status on the measures of physical contact. In the analyses for PEI classification by peer friendship status and sex by peer friendship status, the main effect for peer friendship status was nonsignificant, multivariate F (6,25) = 2.16, n.s., and multivariate F (6,27) = 1.37, n.s., respectively. There was also no interaction between peer friendship status and PEI classification, multivariate F (18,71.20) = .97, n.s., nor between peer friendship status and sex, multivariate F (6,27) = .40, n.s..

Effects on measures of play and social involvement . There were no significant effects of peer friendship status on the measures of play and social involvement. In the analyses for PEI classification

Table 15

Mean duration of interaction with same-sex friends and non-friends in analyses of contact and play and involvement behaviors

	28-sec. Intervals (M, SD)	Mean Duration in Minutes
Contact Behaviors (n = 34)		
Reciprocal Friends	12.88 (12.73)	6.01
Non-Friends	18.29 (13.11)	8.54
Unilateral Friends		
Nomination Made	3.56 (5.92)	1.66
Nomination Received	3.38 (7.19)	1.58
Play and Involvement Behaviors (n = 30)		
Reciprocal Friends	13.37 (12.67)	6.24
Non-Friends	19.30 (13.24)	9.01
Unilateral Friends		
Nomination Made	3.70 (6.18)	1.73
Nomination Received	3.53 (7.28)	1.65

by peer friendship status and sex by peer friendship status, the main effect for friendship status was nonsignificant, multivariate F (6,21) = .93, n.s., and multivariate F (6,23) = 1.18, n.s., respectively. There was no interaction between peer friendship status and PEI classification, multivariate F (18,59.88) = .66, n.s., nor between peer friendship status and sex, multivariate F (6,23) = .75, n.s..

Summary . Multivariate analyses of variance revealed no significant differences in children's behavior (physical contact and social involvement) when interacting with a friend versus a non-friend.

Discussion

Friendship has been considered a significant aspect of peer relations worthy of study separately from that of peer acceptance or popularity (Mannarino, 1980; Masters and Furman, 1981). The results of the present study suggest that, at least quantitatively, numbers of friends and popularity are strongly related, with correlations of .72 and .82. This indicates that approximately 50% to 67% of the variance in numbers of friends may be accounted for by knowledge of a child's social status or popularity, and conversely, that at least 33%, or one-third, of the variance remains unaccounted for. These figures are consistent with Furman's (1984) suggestion that having a friend and popularity are concepts that overlap but are not synonymous. On the basis of the present study, it may be suggested

that the reciprocal aspect of friendship might account for some of the variance which is unique to friendship. Results of studies of children's conceptions of friendship (e.g., Furman and Childs, 1981; Youniss, 1980), suggest that several features which may be included in the aspect of reciprocity are mutual liking, loyalty, trust, and respect.

In the present study, however, peer nomination procedures were used to assess both numbers of friends and popularity. The high correlations between the two measures are consistent with Asher and Renshaw's (1981) suggestion that nomination sociometric procedures measuring popularity identify the number of friends a child has, whereas peer rating scales (e.g., Singleton and Asher, 1977) might better assess peer acceptance. This suggests that in the present study, method variance accounts for a significant part of the variance shared between numbers of friends and popularity and that in future studies, alternative measures to peer nomination procedures might be used to assess popularity.

If peer nomination procedures identify the number of friends a child has, however, then the unequated group difference on numbers of friends is worth noting. It suggests that to the extent that friendship is of functional significance in the development of social skills, withdrawn and aggressive-withdrawn children are particularly at risk, as indicated by their difficulty in forming or maintaining a friendship. Conversely, if having a friend is an indicator of psychological health, then one efficient way of identifying children

at risk may be to look at whether or not they have a friend.

Another aspect pertaining to group differences in friendship and popularity is noteworthy. In comparison to withdrawn and aggressive-withdrawn children, the aggressive children in the present study were similar to their nondeviant classmates on numbers of friends and on popularity. This finding may be related to the selection of aggressive children as defined by the PEI. As described above, the items on the PEI relate to aggression as a global construct, including various aspects of aggressive behavior. Some items tap impulsive, hostile behaviors which may reflect social deficits, for example, "Those who start fights over nothing" and "Those who are mean and cruel to other children". Other items tap more controlled forms of aggressive behaviors which may relect a high degree of social skills, for example, "Those who tell other children what to do" and "Those who try to get others into trouble". From this perspective, although the aggressive children selected by the PEI may be impulsive or even hostile in their behavior, they may also be similar to their nondeviant peers in that they possess the social skills required for forming and maintaining a friendship. Other studies have reported similarities between aggressive and nondeviant children, namely in the area of social cognitive skills (Bergeron and Schwartzman, 1981; Kurdek, 1978). Based on Piaget's (1926; 1932) hypothesis of a relationship between peer interaction and social development, it may be speculated that aggressive children's frequent interaction with peers may even contribute to their learning of

social skills.

The absence of a sex difference in numbers of reciprocal friends is noteworthy in its inconsistency with the common report that boys have more friends than girls (Eder and Hallinan, 1978). The present finding may be due to this study's definition of friendship as reciprocal, which may have served to decrease the number of male friendships to those which are mutual, or more intensive, in nature. On the other hand, the overall finding of more same-sex than cross-sex friendships, at least in nondeviant children, is consistent with previous reports (e.g., Kandel, 1978) that preadolescent friendships are predominantly between children of the same sex. On an empirical level, the replication of this finding serves to validate the measure of friendship as used in the PEI. Theoretically, it is consistent with Sullivan's (1953) emphasis of the importance of same-sex friendships.

Age differences in numbers of friends were noteworthy in that although children in grades 4 and 5 named more peers as friends than children in grades 6 and 7, children in the older group had more reciprocal friends. Combined with the absence of a difference in nominations received by peers, these findings suggest that there may be a developmental trend in children's ability to identify peers as friends. Older children may be better able to identify peers who like them than younger children, who appear to be more inclusive in their friendship choices.

The results of the multiple regression analyses assessing the

differential strength of the number of friends and popularity in the prediction of behavior have conceptual and methodological implications. On the basis of this study, it is difficult to clearly differentiate friendship status from popularity in their relationships to behavior. This statement is based on the mixed success of each variable in remaining a significant predictor of behavior after the effects of the other variable had been removed. That is, once the effects of popularity had been removed, friendship status continued to account for a significant portion of the variance in three of the four variables in which it was originally significant, measures of attention and aggression directed by peers towards aggressive-withdrawn children of both sexes, and of aggressive behavior produced by aggressive-withdrawn boys. Friendship status no longer remained a significant predictor of the frequency of touching by aggressive children, however.

Similarily, once the effects of friendship status had been removed, popularity remained a significant predictor for all classification groups of children for two of four measures of social involvement, attention given by target to peers and level of target motor activity, whereas it did not remain a significant predictor for measures of attention elicited by target children from peers and peer touches of target. These results support the suggestion by Furman (1984), that friendship and popularity are overlapping but not synonymous concepts. They suggest that friendship status and popularity may have differential relationships to specific types of

behavior, or within specific groups of children. Given that the measures of friendship status and popularity used in this study were highly correlated, then in order to further explore the behavioral correlates of friendship status versus popularity, another measure of peer acceptance such as a peer rating scale (e.g., Singleton and Asher, 1977) might be used. It might also be interesting to examine the relationship to behavior of scores on the likeability scale of the PEI (Pekarik et al., 1976). Although this scale is based on peer nominations, it may provide a more global measure of peer acceptance than the number of friendship nominations received, and may be less correlated with friendship status.

Although the present study is inconclusive regarding the differential relationship of friendship status and popularity to behavior, the results show that after the effects of school, sex and PEI classification had been removed, friendship status or nominations received was entered as a significant predictor for eight of the eleven behavioral measures used, for at least one of the four PEI classification groups. Based on the high degree of shared variance between the two measures, and on the suggestion that peer nomination procedures measure the number of friends a child has (Asher and Renshaw, 1981), then taken together, these results suggest that some aspect of friendship bears a relationship to playground behaviors. First, for all groups of deviant and nondeviant children, the receiving of friendship nominations was related to a higher level of involvement with peers, for example being touched, giving and

eliciting attention, and maintaining a high level of motor activity. These results support the previous finding (Hartup et al., 1967) of a positive relationship between peer status and the quality of social involvement.

In addition, although friendship status was not found to be related to behavior in all groups of children, it was related to touching of peers for aggressive children, and was a strong predictor of involvement in aggressive interactions for the aggressive-withdrawn group. In comparison to aggressive-withdrawn children who do not have a friend, aggressive-withdrawn children who have a friend were found to receive more attention and to be aggressed against more frequently by their peers. Aggressive-withdrawn boys who have a friend were also found to produce more aggressive behaviors than their classification group counterparts who do not have a friend. These results suggest that aggressive-withdrawn children who have a friend, especially boys, may be socially involved to a greater extent than aggressive-withdrawn children who do not have a friend. Moreover, to the extent that the aggressive behaviors engaged in on the playground constitute rough-and-rumble play rather than hostile aggression, and to the extent that the performance of aggressive behaviors with peers contributes to socialize children (Fine, 1981; Harlow, 1969), having a friend may be an indicator of a higher level of social maturity in aggressive-withdrawn children. In comparison, aggressive-withdrawn children who do not have a friend may engage less frequently in

aggressive interactions with peers, but may also be less socially involved and more isolated overall.

It is also noteworthy that friendship status was not related to behavior for any other classification group. This finding suggests that having a friend may be an indicator of relative psychological health in aggressive-withdrawn, but not in other classification groups of children. On the other hand, the failure to find a relationship between friendship status and behavior in all classification groups may also be related to the selection of criterion measures used. The observed behaviors were playground interactions, a large portion of which comprised semi-organized, "high energy" activities such as dodge ball and Chinese jump rope. Moreover, observations were made during the recess break, at which time all children may have engaged in a high level of activity in order to release physical energy. This may have inflated the measures of physical involvement in all children. Although friendship status appears to be related to social interactions under these conditions for aggressive-withdrawn children, the theoretical and research literature suggests that semi-organized playground activities may not be the behaviors most greatly affected by friendship. As supported by McGuire and Weisz (1982), Sullivan's (1953) theory would predict that in comparison to children who have no friend, children who have a friend would show a higher degree of interpersonal sensitivity, such as empathy, trust and altruism. These are qualities of social interaction which were not examined in the present study. Part of the

challenge of studying friendship is to identify those aspects of social interaction which are most influenced by the friendship process, and then to describe the nature of the effect. In relation to social skills, Ladd and Mize (1983) have discussed the importance of using measures that are sensitive to the hypothesized processes of skill learning as well as to relevant social outcomes. A similar task for researchers of friendship is to develop measures which are sensitive to the process and outcome variables related to friendship.

The issue of outcome measures is also pertinent to the failure to find an effect in the third part of the study examining the effect on behavior of interacting with a friend versus a non-friend. In addition to an excessively small sample size for this analysis, and a limited sample of behavior, it may be questionned whether the playground behaviors observed and the level of detail studied are relevant to the study of friendship. Given that all subjects were classmates, therefore acquaintances, it is perhaps not surprising that pairs of friends and non-friends did not differ on measures such as the duration of games like dodge ball or Chinese jump rope, or the frequency of touching or aggressive behaviors on the playground. In comparison, studies finding effects on interactions between friends and non-friends have examined more subtle interpersonal or communicative behaviors such as the mutual exchange of glances and smiles (Foot et al., 1977), the expression of positive and negative feelings about one another's behavior (Furman and Childs, 1981), and task-oriented (process and outcome) behaviors (e.g., Newcomb and

Brady, 1982; Sharabany and Hertz-Lazarowitz, 1981). Children on the playground may have been engaged in the communication of feelings or in task negotiation, however the behavioral code used in the present study was not designed to measure this type of interaction. The small number of subjects and limited sample of behavior make any conclusions tentative on the basis of these data; however it may be suggested that a fine-grained analysis of specific aspects of social interactions is necessary to identify the differential effects of interacting with a friend versus a non-friend. The results of the present study suggest that visual observation of outdoor, semi-organized play may not be appropriate for this task, and that a semi-contrived situation may be necessary to elicit more personal interactions and to allow for the measurement of the content of conversation as well as the behaviors of subjects.

Summary

The findings of the present study have conceptual and methodological implications. The high correlations between the number of friends and popularity scores are consistent with the suggestion (Furman, 1984) that friendship and popularity are overlapping but not synonymous concepts. The correlations may also be attributed to the use of peer nomination procedures to assess both constructs, however, and suggest that another measure of peer acceptance, such as a peer rating scale (e.g., Singleton and Asher, 1977) or the likeability scale of the PEI (Pekarik et al., 1976), be used. This suggestion is

also supported by the difficulty in clearly differentiating between the relationship of friendship and popularity to behavior in the regression analyses, a result which may also be partly attributed to the high correlation between the two measures.

If peer nomination scales measure the number of friends a child has (Asher and Renshaw, 1981), however, then several findings are worth noting. First, the group difference on numbers of friends suggests that to the extent that friendship is of functional significance in the development of social skills, withdrawn and aggressive-withdrawn children may be at risk, as indicated by their difficulty in forming or maintaining a friendship relationship. Second, the results of the regression analyses suggest that taken together, some aspect of friendship is related to behavior. The relationship in aggressive-withdrawn children between having a friend and involvement in aggressive interactions with peers suggests that having a friend may be an indicator of psychological health in aggressive-withdrawn children. The relationship in all classification groups of children between popularity, as measured by the number of friendship nominations received, and four measures of social involvement and motor activity supports the previous finding (Hartup, 1967) of a positive relationship between peer status and the quality of social interactions.

The absence of a relationship between friendship status and behavior in all classification groups of children suggests that having a friend may be an indicator of health in aggressive-withdrawn

children only. On the other hand, it may also be related to the lack of relevance of the measures used in the present study to aspects of social interactions likely to be influenced by friendship, such as empathy or altruism. The choice of outcome measures may also be related to the failure to find an effect on behavior of interacting with a friend versus a non-friend. Future observational research might consider the use of semi-contrived situations which elicit and facilitate the measurement of behaviors relevant to friendship.

Reference Note

1. Effects of school, sex and PEI classification are reported in Lyons, J. (1984). Naturalistic observation of peer-identified aggressive, withdrawn, aggressive-withdrawn and contrast children. Unpublished doctoral dissertation, Concordia University, Montreal, Canada.

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Appendix A

Pupil Evaluation Inventory

(Pekarik, Prinz, Liebert, Weintraub and Neale, 1976)

VOTRE NOM		VOTRE NUMÉRO:		
1. Ceux qui sont plus grands que les autres				
2. Ceux qui aident les autres				
3. Ceux qui ne sont pas capables de rester assis tranquilles				
4. Ceux qui essaient de mettre les autres dans le trouble				
5. Ceux qui sont trop timides pour se faire des amis facilement				
6. Ceux qui se sentent trop facilement blessés				
7. Ceux qui prennent des airs supérieurs et qui pensent qu'ils valent mieux que tout le monde				

8. Ceux qui font les clowns et font rire les autres				
9. Ceux qui commencent la chicane à propos de rien				
10. Ceux qui ne semblent jamais s'amuser				
11. Ceux qui sont bouleversés quand ils ont à répondre aux questions en classe				
12. Ceux qui disent aux autres enfants quoi faire				
13. Ceux qui sont d'habitude les derniers choisis pour participer à des activités de groupe				
14. Ceux que tout le monde aime				

15. Ceux qui s'empêtrent tout le temps et se mettent en difficultés				
16. Ceux qui rient des gens				
17. Ceux qui ont très peu d'amis				
18. Ceux qui font des choses bizarres				
19. Ceux qui sont vos meilleurs amis				
20. Ceux qui ennuient les gens qui essaient de travailler				
21. Ceux qui se mettent en colère quand ça ne marche pas comme ils veulent				

22. Ceux qui ne portent pas attention au professeur				
23. Ceux qui sont impolis avec le professeur				
24. Ceux qui sont malheureux ou tristes				
25. Ceux qui sont particulièrement gentils				
26. Ceux qui se comportent comme des bébés				
27. Ceux qui sont méchants et cruels avec les autres enfants				
28. Ceux qui souvent ne veulent pas jouer				

29. Ceux qui vous regardent de travers				
30. Ceux qui veulent faire les fins devant la classe				
31. Ceux qui disent qu'ils peuvent battre tout le monde				
32. Ceux que l'on ne remarque pas beaucoup				
33. Ceux qui exagèrent et racontent des histoires				
34. Ceux qui se plaignent toujours et qui ne sont jamais contents				
35. Ceux qui semblent toujours comprendre ce qui se passe				

1. Celles qui sont plus grandes que les autres				
2. Celles qui aident les autres				
3. Celles qui ne sont pas capables de rester assises tranquilles				
4. Celles qui essaient de mettre les autres dans le trouble				
5. Celles qui sont trop timides pour se faire des amis facilement				
6. Celles qui se sentent trop facilement blessées				
7. Celles qui prennent des airs supérieurs et qui pensent qu'elles valent mieux que tout le monde				

8. Celles qui font les clowns et font rire les autres				
9. Celles qui commencent la chicane à propos de rien				
10. Celles qui ne semblent jamais s'amuser				
11. Celles qui sont bouleversées quand elles ont à répondre aux questions en classe				
12. Celles qui disent aux autres enfants quoi faire				
13. Celles qui sont d'habitude les dernières choisies pour participer à des activités de groupe				
14. Celles que tout le monde aime				

15. Celles qui s'empêtrent tout le temps et se mettent en difficultés				
16. Celles qui rient des gens				
17. Celles qui ont très peu d'amis				
18. Celles qui font des choses bizarres				
19. Celles qui sont vos meilleures amies				
20. Celles qui ennuient les gens qui essaient de travailler				
21. Celles qui se mettent en colère quand ça ne marche pas comme elles veulent				

22. Celles qui ne portent pas attention au professeur				
23. Celles qui sont impolies avec le professeur				
24. Celles qui sont malheureuses ou tristes				
25. Celles qui sont particulièrement gentilles				
26. Celles qui se comportent comme des bébés				
27. Celles qui sont méchantes et cruelles avec les autres enfants				
28. Celles qui souvent ne veulent pas jouer				

29. Celles qui vous regardent de travers				
30. Celles qui veulent faire les fines devant la classe				
31. Celles qui disent qu'elles peuvent battre tout le monde				
32. Celles que l'on ne remarque pas beaucoup				
33. Celles qui exagèrent et racontent des histoires				
34. Celles qui se plaignent toujours et qui ne sont jamais contentes				
35. Celles qui semblent toujours comprendre ce qui se passe				

Appendix B

Observational Code Definitions

(Handout supplied to coders at first training session)

Observational Code Definitions

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A four-pass system will be used for coding the video-taped segments on the More observational units. The first of these passes allows you to identify the target and the context of the segment you are about to code. The remaining three passes are used to code three types of behavioral categories.

Do not assume that an event has happened if you did not actually see it.

Context Pass: Do not code anything during this pass. Merely determine which child is the target and watch how that child interacts with his/her peers.

First Pass (duration variables):

A) SOCIAL PLAY

GROUP: Target shares common goal (either cooperative or competitive) with more than one peer. Must include an active physical component. Exclude such behaviors as assisting the teacher, helping a hurt child, waiting to take a turn in a game (i.e., hopscotch), mere conversation, fighting, and kicking snow. Repeated aggression between the same individuals (excluding a fight) should be coded as PLAY. If in doubt as to whether behavior should be coded as PLAY, always code as PROXIMITY instead (see below).

PEER Same as above but with only one partner.

SEX The sex of the group or peer with whom the target is playing is coded in the following manner.

Same as target
Opposite of target
Both sexes present
Indeterminate

* If there is no PLAY (as defined above), the following category should always be coded. (See PROXIMITY.)

B) PHYSICAL PROXIMITY

GROUP Target remains within one meter of two or more children for a codable length of time (i.e., do not code PROXIMITY if a group of children merely walk by an isolated target without stopping). Target may be proximal to a succession of children for GROUP PROXIMITY to be scored (i.e., he or she may be walking through a crowd of peers). He or she need not remain proximal to the same group.

PEER Target remains within one meter of another child or a succession of single children for a codable length of time. As above, do not score PEER PROXIMITY for an isolated child when a peer passes by without stopping. Do not code PEER PROXIMITY if the child is only proximal to the teacher.

SEX Sex of the peers that are proximal to the target should be scored as above.

WITH NO PEER If there is more than one meter between the closest parts of the target's and peer's bodies for a codable length of time, then NO PEER should be scored.

Second Pass (frequency variables):

A) TOUCH

TARGET TOUCH Target put hand, arm, or body in contact with a peer other than in the context of aggression (as described in next section). If in doubt as to whether contact occurred, do not score TOUCH. If in doubt as to whether target moved to touch peer or vice versa, score TOUCH for the target and not for the peer. If touch appears mutual, score it as a TARGET TOUCH.

PEER TOUCH As above except initiated by the peer.

B) TARGET AGGRESSION: For target aggression, a distinction is made between PUNCH, SLAP, and all other forms of aggression described under OTHER.

1) PUNCH

INCITES Target punches a peer when that peer did not aggress against the target during the previous five seconds.

RETALIATES As above, except that the peer had aggressed against the target within the previous five seconds.

2) SLAPPING

INCITES Target slaps a peer when that peer did not aggress against the target during the previous five seconds. Do not include Pat-A-Cake or other hand games as SLAPPING. NOTE- Velocity should distinguish SLAPPING from TOUCH.

RETALIATES As above, except peer had aggressed against the target during the previous five seconds.

3) OTHER AGGRESSION This category includes all other forms of aggression other than PUNCH and SLAP.

INCITES Target pushes, scratches, kicks, bites, chokes, pokes, pinches, pulls forcefully, collides with, hits with object in hand, wrestles with, wrestles with over an item, trips, hangs or jumps on, grabs an item of clothing, or throws something (excluding a ball in a game) at a peer when that peer did not aggress against the target in the previous five seconds. NOTE- Velocity and weight should distinguish "hanging on" from TOUCH.

RETALIATES As above, except peer had aggressed against the target during the previous five seconds.

C) PEER AGGRESSION No distinction is made among the various forms of peer aggression. All forms that comprise the three types of target aggression are to be simply coded as PEER AGGRESSION when exhibited by the peer. INCITED should be coded when the target had not aggressed against the peer during the previous five seconds. If the target had aggressed against the peer during the previous five seconds, then RETALIATED should be scored.

NOTE*** In the event that either target or peer engages in several rapid acts of aggression within a very short time period against the same victim, the act should only be coded once. For example, if A punches B four times very quickly, PUNCH should only be coded once. Aggression may be scored more than once (i.e., once for each discrete act) if the victim of the act is changed, if there is at least a 3-second pause between each discrete act of aggression, if more than one form of TARGET AGGRESSION is used (e.g., both PUNCH and SLAP), or if the first act INCITES aggression but subsequent acts are done in RETALIATION.

Aggression should be scored when the target accidentally becomes part of an incident. For example, if a third party pushes a peer into the target this would be scored as PEER INCITES AGGRESSION. Similarily, if target is pushed into a peer by a third party it should be scored as TARGET INCITES AGGRESSION.

Third Pass (ratings): Only one of these categories is to be scored for a given 7-second coding interval. Thus, each of the four categories is coded every 28 seconds.

A) LEVEL OF INVOLVEMENT

Three different measures of level of involvement are to be coded on a high-medium-low scale. The criteria involved in making the ratings are as follows:

TARGET GIVES The average (mean) amount of attention that the target gives to his or her peers throughout the interval is scored as HIGH, MEDIUM, or LOW.

Examples:

HIGH-
1) involvement in conversation with peer (more than just a few words). Peer does not have to respond. If target's face is not seen, but peer is facing target and speaking, assume target is involved in conversation.
2) any active physical involvement in a game
3) following a peer around the playground
4) initiating any sort of intentional touch or contact
5) completing an approach by walking in front of a peer and facing him or her

MEDIUM-
1) actively watching a peer--not just a fleeting glance
Should take place for majority of the interval.
2) passive presence in group game

LOW-
1) looking at but not actively tracking peer
2) total disinterest in surrounding activities

TARGET ELICITS The amount of attention that the target attempts to elicit from peers. This should also be a mean rating except where stated otherwise.

Examples: HIGH- 1) calls out to or reaches out to touch a peer (intentionally)
2) initiates conversation or a game
3) is the active center of conversation or game or is actively seeking the role (e.g., jumping rope, throwing or grabbing the dodgeball)
Assume target is center in dyadic conversation with peer.
4) completes an approach by walking in front of peer and facing him or her

*NOTE- A single incidence of the above in any interval warrants a HIGH for that interval.

MEDIUM- 1) is involved in group conversation or game but is not the center of it
2) merging with a clearly defined group without doing any of the things that constitute a HIGH

LOW- 1) does not initiate any interaction
2) not involved in conversation or game

PEER GIVES The average (mean) amount of attention that the peers give to the target throughout the interval is scored as HIGH, MEDIUM, or LOW.

Examples: HIGH- 1) involvement in conversation with target (more than just a few words)
2) game with peers centers around the target
3) peer follows the target around the playground
4) peer initiates any sort of intentional touch or contact toward the target
5) peer completes an approach by walking in front of and facing target

MEDIUM- 1) a peer actively watches the target--not just a fleeting glance. Should take place for at least 1/2 of the interval.

LOW- 1) peer looks at, but does not actively track target
2) peers' total disinterest in target's activities

B) MOTOR LEVEL OF TARGET

The mean motor level of the target during the interval should be coded as HIGH, MEDIUM, or LOW.

Examples:

HIGH- Physical activity includes running, jumping, or wild and rapid swinging of the arms (not just a single punch). Should take place for at least 1/2 of the interval.

MEDIUM- Physical activity includes walking and/or swinging of arms and legs.

LOW- Inactive or slight movement of arms and legs, maximum of 2 steps.

C) UNCODABLE

Target is not visible for five or more seconds during the interval or is not visible during the middle of the interval for any length of time. If camera was stopped and filming resumed while target was in the same situation as before it should not be necessary to consider the interval uncodable. If target had changed location, associates, behavior, etc. by the time filming was resumed, score the interval as UNCODABLE. If UNCODABLE is scored for an interval, no other behaviors should be rated during that interval.

Appendix C

Procedure for Coding Sessions

(Handout supplied to coders at first training session)

Procedure for Coding Sessions
High Risk Observational Project
Concordia University
Centre for Research in Human Development

This handout describes the entire procedure to be followed during a typical coding session. It includes 1) operation of the MORE observational unit, 2) header information, 3) list of codes to be used, and 4) data transfer information. Code definitions are included in a separate handout.

PRELIMINARY PREPARATION

A) Turning on the MORE unit

In the battery pack, LIFT and move the power toggle switch to ON. DO NOT force the switch without lifting. DO NOT turn the MORE off after a coding session until the data has been successfully transferred to an audio cassette tape. Turning the power switch off erases all of the data that has been stored in the MORE's memory.

B) Beginning a Session

The following procedure must be followed precisely.

KEYS	FUNCTION
1) Reset	Enters the MORE system
2) RED Down	Enables data alteration
3) CLEAR	Clears all pointers and writes the four digit MORE ID into memory
4) RED Up	Data protect mode (data entered cannot be altered)

C) Session Identification

The session and trial header information for the first segment to be coded will be entered at this point. This information is entered once at the beginning of each coding session. It sets up the MORE unit for the type of coding session that will be taking place.

DISPLAY	KEY	FUNCTION
	Code	Starts the Trial
CSCS		Asks for the coding scheme
	EC,ADV	Selects Elapsed Clock mode for the coding scheme
C1C1		Asks for code length
	02,ADV	Code length = 2 digits
SCSC		Asks for total time for session clock to run
	04,ADV	Segments should never be longer than 4 minutes
0000		Asks for trial header information

D) Trial Identification

At this point the trial identification for the first subject to be coded is entered. It must always be entered in the same order and precisely as explained below. The trial identification information is needed to distinguish the data for one subject from that of another subject.

DISPLAY	KEY	FUNCTION
0000		Asks for header info.
0000	01,ADV	Observer ID #
001A	02,ADV	Coding week # (i.e., week 2)
A02A	03,ADV	Order of segment by date filmed (i.e., 03 = third segment)
A03A	05,ADV	Tape # being viewed
A05A	596,ADV	Starting footage of segment
596A	125,ADV	Segment length (in seconds)
125A	15325,ADV	Subject ID #
325A	02,ADV	Subject sex 01=m, 02=f
A02A	01,ADV	Pass # (01, 02, or 03)
A01A	DATA	Starts data portion of the trial
Blank		

E) Context

Play the segment you are about to code. Identify which child is the target. Watch the target's behavior carefully, but do not code anything. Notice the general context of the child's behavior. Examine complex interactions so you will be able to code them accurately during later passes. Decide how the toggles should be set to start the first coded pass and set them accordingly (see below).

F) Synchronization Process

You are now ready to begin coding the first pass of the tape (i.e., coding proximity and play) for the first subject. Before touching the keyboard of the MORE again, you must position the video-tape to a point 5-10 seconds (1-2 ft.) before the actual beginning of the segment to be coded. The following procedure should be followed precisely to ensure synchronization of the behavior on the video-tape with that of the session clock and the MORE's memory. This enables us to compute interobserver agreement for each segment.

1) Ensure that the audio portion of the video-tape can be heard.

2) Begin the video-tape.

3) Listen for the cue to start coding. At 7-second intervals throughout the tape, an auditory prompt (either a 6,7,8,or 9) will be heard. The log book will list the appropriate starting prompt for each segment.

4) "00", a dummy code that is simply used to start the MORE's session clock, must be keyed into the MORE unit immediately when the starting prompt is heard.

THE CODING SESSION

The coding session is divided into three passes, one for each of the three types of behavioral categories that are defined within the code.

A) First Pass

During the first pass, play and/or proximity are coded according to the definitions supplied elsewhere. These categories are coded on the toggle switches, the layout of which is as follows. The child's initial status should be entered on the toggles before "00" is keyed to start the pass.

	Proximity	Peer	Group	Uncodable
Switch #:	1	2	3	4
	Play	Off	Off	Off

	(Not used)		Sex	
			Same	Opposite
Switch #:	5	6	7	8
			Off	Off

When the status of the child's behavior changes several switches may have to be turned on or off (up or down). This must be done within 3 seconds from the time you switch the first toggle so that the MORE can recognize this as a single event change as opposed to a number of intermediate changes (3 seconds is longer than you think and should be enough time). If the subject moves out of sight, Toggle # 4 should be switched ON until the subject reappears, at which time the toggle should be switched OFF. (This is only required during the first pass). If an incorrect toggle is switched ON it should be immediately switched OFF, but if more than 2 seconds elapse then you should recode the entire pass.

Following are examples of the toggles that must be ON for all possible codes in these categories.

If the child is in play:

27- peer same sex
28- peer opposite sex
2- peer indeterminate sex
37- group same sex
38- group opposite sex
378- group both sexes
3- groupindeterminate sex

If child is not in play but is proximal to a peer:

127- peer same sex
128- peer opposite sex
12- peer indeterminate sex
137- group same sex
138- group opposite sex
1378- group both sexes
13- group indeterminate sex

If child is alone and not in play:

1- not proximal to anyone

At the end of the segment you should push the FINISH button and only then turn OFF all of the toggles.

You have now completed the first pass of the tape. The header information for the second pass of the tape is precisely the same as in the first pass except for the pass #, which is the last 2 digits of the header. The MORE is capable of overlaying only the last 2 digits without having to repeat the entire header. Enter "02 ADV" then press "DATA" and proceed as outlined in the section entitled synchronization process.

B) Second Pass

The second pass through the video-tape is for coding the contact categories. These categories are entered on the keys. During the second pass the earphone should be worn so that you can code without having to look at the display. Every time that you enter the second digit of a code the earphone will deliver a 'beep' which will tell you that it was

entered properly. If the 'beep' is not heard then you must look at the display and determine the error that has been made. The keys cannot be pressed in extremely rapid succession but can be pressed fairly quickly.

Following is a listing of the 2-digit codes for the contact categories:

TOUCH

01- target touch
02- peer touch

PEER AGGRESSION

41- peer incites aggression
42- peer retaliates aggression

TARGET AGGRESSION

11- target incites punch
12- target retaliates punch
21- target incites slap
22- target retaliates slap
31- target incites other
32- target retaliates other

At the end of this pass the FINISH button should be pressed and "03 ADV" should be entered followed by "DATA". This overlays the last 2 digits once again and prepares you for the third pass of the tape. Proceed as outlined in "Synchronization Process" when you are prepared to code the categories included in the third pass.

C) Third Pass

During the third pass, level of involvement and motor level will be coded. As mentioned previously there will be a prompt every seven seconds on the tape. The first prompt within the segment is used as a starting point for coding purposes. The correct starting prompt for each segment is noted in the log book. The three levels of involvement and the motor level will be input on a rotating basis, beginning at the second prompt. Each rating is based on the behavior that occurred during the previous seven seconds.

Watch the video-tape until you hear a prompt (other than the first one), then enter your rating for the appropriate category on the keys. The rating should be made for the category that is stated in the prompt. e.g., a "6" prompts you to code the "60's" category, which is Target Gives Attention. Watch the tape until another prompt is heard, then enter your rating for that category, and so on until the end of the segment. Following is a listing of the codes for each of the categories:

Level of Involvement

60- target gives low
61- target gives medium
62- target gives high
66- target gives uncodable

70- target elicits low
71- target elicits medium
72- target elicits high
77- target elicits uncodable

80- peer gives low
81- peer gives medium
82- peer gives high
88- peer gives uncodable

Motor Level of Target

90- motor level low
91- motor level medium
92- motor level high
99- motor level uncodable

At the end of the segment, the FINISH button should be pressed to end the coding for the third pass and for that particular segment. You should now locate the next subject to be coded on the video-tape. When you are prepared to begin coding this subject, the new header information must be entered. Once again, it is not necessary to revise the entire header. Information entered during the first (example) trial was as follows:

OB	W#	S#	TP	FTG	SEG	SUBJ#	SX	P#
01 ADV	03 ADV	09 ADV	05 ADV	596 ADV	125 ADV	15325 ADV	02 ADV	01 ADV

Only change what is necessary! For instance, if tape and segment order (S#) remain the same, then only overlay FTG, SEG, SUBJ#, SX, and P#. It should be noted that if something in the header must be changed, everything after it in the line must be either changed or re-entered.

When the header has been properly overlaid to identify the new subject you can press the DATA key to start the coding for the second subject. You must then follow the instructions as outlined in "Synchronization Process".

You should proceed in this manner until all the target subjects that you plan to code during the present session have been coded. IMPORTANT- At the end of the session DO NOT turn off the MORE battery pack or press any more keys. Everything in the MORE's memory will be lost if this is done. The data that has been collected must first be transferred to an audio cassette. Instructions for the transfer to audio cassette are on page 8.

Errors during a coding session

The following are examples of errors that might be made during the course of a session and how they should be corrected.

1) If the incorrect code is entered during a pass and is still visible on the display simply press the ERROR key and immediately enter the correct code.

2) If the error is more serious and cannot be corrected, the entire pass should be recoded. In this case, as soon as the error is detected, code "19", press the FINISH button and re-enter the pass number that is to be recoded. Start the segment over and recode the entire pass.

3) If an error is made on one of the switches and is noticed immediately (within 2 seconds) then it can be corrected by simply changing the switch to the proper position. If the error exists for a longer period it is acknowledged by the MORE unit and the pass should be recoded as explained in #2 above.

4) If an error is made in the header information the ERROR key will only wipe out the field that is currently being entered or, if the ADV key has been pushed, it will clear the last field that was entered.

Example: ADV 02 ADV 03 ADV 04 ERROR	will clear only the 04
ADV 02 ADV 03 ADV 4 ERROR	will clear only the 4
ADV 02 ADV 03 ADV 04 ADV ERROR	will clear only the 04

Note - Once ADV has been pushed, the previous field can be cleared only if the next field has not yet been entered. For instance, in all of the above examples it would be impossible to correct the "03" if that is where the error had occurred. In the case where the error is no longer accessible to the ERROR key, the following procedure should be used:

i) when the error is noticed , press DATA
ii) then key "19"
iii) press FINISH
iv) reenter the required items for that pass into the header exactly as you should have before.

5) If other errors arise which you do not know how to handle, describe them clearly in writing and leave the note with your audio cassette on the shelf in the lab.

MORE Dump to Cassette Instructions

1. Use one side of the cassette only.
2. Leave at least five feet of cassette tape between dumps.
3. Start dump onto cassette at multiples of 10 feet.
4. File ID's can be any 2-digit number between 01 and 99.
5. Keep log of entries and file ID'S. including starting and ending footage.

Dump to Cassette

Connect the MORE's output to the recorder's input port (RED WIRE FROM MORE'S OUTPUT TO CASSETTE MICROPHONE INPUT). Lock RED down on the MORE and press DUMP. The display on the MORE will prompt "bdbd". Key in "02 ADV". The MORE will then prompt "odod". Key in "01 ADV", and the MORE will request a file ID with the prompt "CFCF". Key in your file ID (01-99) and check to see that the desired file ID appears on the right side of the MORE's display. Turn the volume all the way up and set the tone at 5. Then position the tape to the desired spot, place the recorder in the record mode (press RECORD button only) and allow the recorder to pick up speed before pressing the last "ADV". The last "ADV" will release the data in the MORE into the cassette, therefore be sure to press "ADV" only when the desired starting place on the cassette tape (multiples of 10) has been reached.

Verifying the Dump

After dumping to the cassette, the MORE will respond with "dddd" (meaning that the dump has been completed). To verify that the dump has been successful, connect the recorder's output port (EARPHONE OUTPUT) to the MORE's input port (BLACK DOT) using the BLACK WIRE. Rewind the tape, press "ADV" and start the cassette. A correct verification will return "dddd". This assures you that the data was properly transferred. If the display shows "EEEE" it means that an error has been detected and you should redump the data. If so, release the RED button. RESET. lock RED down again, and press DUMP. If the display stays blank, the MORE could not read the file ID. Check all of the connections. make sure the volume control is turned all of the way up and the tone control is on 5, and try again.

Appendix D

Intercorrelations among single measures included in global measures of Play, Proximity to Peers, Target Aggression and Peer Aggression

Table A

Intercorrelations among aggregated variables

in the global variable Play (N = 112)

	Group play Same sex	Group play Opposite sex	Group play Both sexes	Peer play Same sex	Peer play Opposite sex
Group play Same sex	-	-.083	-.536**	-.213*	-.214*
Group play Opposite sex		-	.066	-.065	.333**
Group play Both sexes			-	-.123	.037
Peer play Same sex				-	.015
Peer play Opposite sex					-

* $p < .05$

** $p < .01$

Table B

Intercorrelations among aggregated variables in the global variable Proximity to peers (N = 112)

	Group prox Same sex	Group prox Opposite sex	Group prox Both sexes	Peer prox Same sex	Peer prox Opposite sex
Group prox Same sex	-	-.123	.187*	.367**	-.231**
Group prox Opposite sex		-	.543**	-.034	.416**
Group prox Both sexes			-	.173*	.106
Peer prox Same sex				-	-.101
Peer prox Opposite sex					-

* $p < .05$

** $p < .01$

Table C

Intercorrelations among aggregated variables in the global variable Target aggression (N = 112)

	Incites Punch	Retaliates Punch	Incites Slap	Retaliates Slap	Incites Other	Retaliates Other
Incites Punch	-	.542**	.206*	-.007	.465**	.362**
Retaliates Punch		-	.059	.252**	.154	.227**
Incites Slap			-	.201*	.281**	.181*
Retaliates Slap				-	.016	.036
Incites Other					-	.687**
Retaliates Other						-

* $p < .05$

** $p < .01$

Table D

Intercorrelation among aggregated variables

in the global variable Peer aggression (N = 112)

	Peer incites aggression
Peer retaliates aggression	.688**

** $p < .01$