Naturalistic Observation of Peer-identified Aggressive, Withdrawn, Aggressive-withdrawn, and Contrast Children

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ABSTRACT

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The playground behavior of peer-identified typical and atypical children was observed. The subjects were 117 grade 4-6 children who had been categorized as Aggressive, Withdrawn, Aggressive-withdrawn, or Contrast (non-aggressive, non-withdrawn) on the basis of peer nominations on the Pupil Evaluation Inventory (Pekarik, Prinz, Liebert, Weintraub, & Neale, 1976). The target children's behavior was unobtrusively videotaped repeatedly over a period of months.

A discriminant function analysis was able to place 52% of the children in the correct peer-identified category on the basis of their observed behavior. Withdrawn and Aggressive children were classified more accurately than Aggressive-withdrawn or Contrast children. The behavior of the Aggressive-withdrawn children was quite similar to that of the Contrast group, and therefore the discriminant functions were limited in their ability to differentiate between these two groups. The mean behavior of the Withdrawn group was quite distinct from that of the other three groups.

Analyses of variance were used to identify the specific behaviors which characterized each of the four groups. Aggressive children spent

a lot of time with a group, were very physically active, frequently incited aggression, and often touched and were touched by peers. Withdrawn children spent less time in a group, were less active, less aggressive, and less involved in touching. They spent a lot of time alone, paid less attention to others and received less attention than other children. The Aggressive-withdrawn children received frequent aggressive initiations from peers relative to how frequently they initiated aggression. The Contrast group received moderate scores on all behavioral categories. Boys were found to touch and incite aggression more frequently than girls. They were also more physically active.

The PEI's ability to identify Aggressive and Withdrawn children was behaviorally validated. Implications for early identification and treatment of children at risk for later psychological problems are focused on. Similarities and differences between the children in this study and the Controversial, Neglected, Rejected, and Average children studied by others are discussed.

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Many children are referred for psychotherapy each year, but unfortunately those children who really need psychological help often are not the ones who are referred for assessments (McCoy, 1976; O'Neal & Robins, 1958b). Several factors help account for this misallocation of services. In 1969, for example, Bower reported that although teachers were often able to detect early signs of psychopathology in children, they rarely referred disturbed students for treatment. According to Senyk (1983), this is still true today. In Montreal, it is estimated that fewer than one third of the students who elementary school staff feel are in need of psychotherapy are actually referred for such treatment (Senyk, 1983). When teachers do make referrals, they are much more likely to refer students who are overly aggressive and disruptive than to refer those who are shy and withdrawn (Greenwood, Walker, & Hops, 1977; Senyk, 1983). Related to this is the fact that teachers refer boys more often than girls (Griffiths, 1952; Robins, 1979; Tyne & Flynn, 1981; Victor & Halverson, 1976). This sex difference in rates of referral is generally attributed to the finding that boys' problems tend to manifest themselves through aggressive/disruptive symptomatology while girls' symptoms are less conspicuous within the classroom setting, since girls tend to quietly withdraw or merely say they feel ill (Achenbach & Edelbrock, 1978; Griffiths, 1952; Stennet, 1966; Victor & Halverson, 1976; Watt, Stolorow, Lubensky & McClelland, 1970). In the past (O'Neal & Robins, 1958a) and possibly still today, even very aggressive children were often not offered psychological help and instead were frequently dealt with through the court system.

Similar factors may influence which children are referred by their families. Disturbed families have been reported to develop a high level of tolerance for psychological symptomatology and therefore not seek therapy (Anthony, 1968; Morris, Escoll, & Wexler, 1956). It has also been suggested that the children of such families may learn to mask their problems when they are around people outside of their family (Anthony, 1968). Even when children are referred by their families, biases are often apparent. Like teachers, mothers may be more concerned about boys' problems than about girls' (Wolff, 1967). Parents frequently identify one child as having psychological problems, when in fact that child is no more and sometimes less disturbed than siblings (Schacter, 1983). These biases are easily compounded by the fact that clinicians may base their evaluation of the child largely on the parents' description of the child's condition, rather than on the child's actual level of functioning (McCoy, 1976).

Recognizing that clinicians are often not reaching those children who are most in need of psychological services, many researchers in recent years have tried to develop effective screening procedures to identify the children who are disturbed and/or at high risk for the development of later psychopathology. Not only is high risk research important so that children manifesting subsyndromal symptomatology can be identified and provided early treatment, it is also critical to the understanding of psychopathology. For decades, the literature on the nature of various disorders has relied primarily on retrospective reports. Retrospective data are subject to many systematic distortions, however (Mednick, 1966; Mednick & McNeil, 1968; Mednick & Schulsinger, 1968; Mednick & Shaffer, 1964; Robins, 1966). For example, children

initially referred to clinics because of fighting have been reported to either become psychotic or be fine as adults, but to rarely become sociopaths or neurotic (O'Neal & Robins, 1958b). A retrospective look at psychotic adults, however, could easily conclude that aggression clearly predicts psychosis--overlooking the fact that many aggressive children grow up to show no psychopathology as adults. The same problem is seen in prospective versus retrospective studies of withdrawal (Weintraub & Neale, 1978). Prospective methods eliminate other biases which might operate in retrospective studies, as well. Since the diagnostic outcome of each child is not yet known when initial assessments are made, researchers, families, and peers are blind as to whether a particular individual will show later maladjustment. Similarly, the assessment data are collected before the effects of later drugs and/or institutionalization take their toll on the subjects who develop psychopathologies. Additionally, data can be collected in a uniform and systematic manner in prospective studies, and high risk subjects who do not develop pathologies provide an excellent comparison group for use in attempts to specify why some individuals decompensated and others did not.

Four basic models have been used in high-risk research (Garmezy, 1972). The first model is based on evidence that indicates that many types of psychopathology have a genetic component. Thus much research has centered on children who have a parent or sibling suffering from schizophrenia, depression, or another psychiatric disorder. The second model places an emphasis on sociogenic factors such as poverty, and has led to the development of such programs as Headstart. The third relates risk to nutritional factors, pregnancy complications, and birth trauma.

The final model--which is the one to be focused on in this study--attempts to predict later psychopathology by identifying those children whose functioning already shows early signs of impairment. Contrary to the common adage, "It's just a phase...they'll grow out of it," some childhood behavior problems and symptoms of early psychopathology do not merely disappear with age (Anthony, 1968; O'Neal & Robins, 1958b; Robins, 1979; Stennet, 1966; Waldron, 1976; Westman, Rice, & Bermann, 1967).

Peers and Peer Relationships as Sources of Predictive Information

Within the early-symptom model, one of the most promising schools of research has focused on the finding that disturbed peer relationships during childhood predict numerous difficulties during adolescence and adulthood. Children who do not relate well with their agemates have been found to be at risk for psychiatric problems, dropping out of school, academic failure, legal infractions, and military disciplinary action (Cowen, Pederson, Babigian, Izzo, & Trost, 1973; Janes & Hesselbrock, 1978; Kohn & Clausen, 1955; Kolvin, Garside, Nicol, Leitch, & MacMillan, 1977; Prinz, Swan, Weintraub, & Neale, 1978; Roff, 1963; Roff, Knight, & Wertheim, 1976; Roff & Sells, 1968; Smith, 1967; Ulmann, 1957; Westman et al., 1967; Zax, Cowen, Izzo, & Trost, 1964).

A number of strategies have been used to examine children's relationships with their peers. Some researchers have obtained teacher ratings to identify children who are unable to interact competently with their classmates (e.g., Janes & Hesselbrock, 1978; Roff, 1963). While teachers have been found to be quite capable of identifying many of the children who are at risk, data collected directly from peers has been shown to be as or even more effective in predicting which children will

be seriously disturbed as adults (Bower, 1969; Cowen et al., 1973; Zax et al., 1964).

Several explanations as to why peers' evaluations of a child's adjustment are able to predict later psychological functioning so well have been put forth (Prinz et al., 1978; Smith, 1967). Learning how to establish healthy peer relationships is a major developmental task throughout childhood. Children who are unable to fit in with their agemates are thus already exhibiting an early sign of adaptational failure (Sroufe & Rutter, 1984). In addition, the lack of healthy peer relationships in and of itself may deprive the target child of many of the forms of play experience that may be needed to develop a full range of social-cognitive skills (Asarnow, 1983; Dodge, Murphy, & Buchsbaum, 1984; Rubin, Maioni, & Hornung, 1976; Rubin & Pepler, 1978). Similarly, the absence of strong peer relationships leaves a child more susceptible to stress, since the social support that might otherwise reduce the negative effects of stressors is lacking (Sroufe & Rutter, 1984; Thoits, 1982). It also limits the child's opportunities to observe and practice age-appropriate social behavior and to learn to accurately interpret the intentions of others in interpersonal interactions (Ladd, 1983).

When it comes to assessing children's behavior, peers have the advantage of having observed the target child in the natural environment over a long period of time. Peer ratings also provide data reported by a large number of observers, each of whom is in a different day-to-day relationship with the target child, and thus the rating reflects multiple perspectives. Another factor of importance is the fact that children perceive social competence rather differently than adults do

and therefore value different qualities and behaviors than adult raters put priority on (LaGreca, 1981; Minturn & Lewis, 1968). Additionally, children behave differently when they are with peers than they do when in the company of adults. With peers, children show more sociable behavior and more aggression than they do with adults, so peers have an opportunity to see these aspects of a child's behavior while adult observers often do not (Hartup, 1979; Martin, Gelfand, & Hartmann, 1971). Another possibility is that peers play an active (albeit, probably unintentional) role in insuring that their predictions come true by responding to the child whom they perceive as having problems in a way which compounds that child's difficulties (Bierman & Allen, 1983; Bierman & Furman, 1984; Cowen et al., 1973; Hartup, 1970; Strain, 1977).

Researchers have employed two frequently overlapping strategies in using peer evaluations to predict concurrent or future psychopathology. One strategy has been to identify target children on the basis of sociometric status. The second approach has used peer evaluations to assess major subject characteristics, such as aggression and withdrawal, which appear related both to quality of concurrent interpersonal interactions and to future psychosocial adjustment.

Sociometric Status

Among the best work done using the sociometric strategy is a series of studies in which children have been asked to name the peers they like best and those they like least. Based on these nominations, five groups of children have been differentiated. Children who are well-liked and rarely named as disliked constitute the Popular group. Neglected children are rarely named either as liked or disliked. Rejected children are those frequently named as disliked but rarely named as

liked. Controversial children are those frequently nominated as both liked and disliked. The Average group consists of those children who receive a moderate number of nominations for being both liked and disliked.

Consistently, it has been found that the Rejected children (those rarely liked but actively disliked) are the group at greatest risk for psychological problems. Peery (1979) found that Rejected 4-year-olds received poorer scores on a social comprehension questionnaire than did Popular children. Dodge et al. (1984) studied Rejected, Neglected, Average, and Popular children in kindergarten and grades 2 and 4 and obtained results that back up Peery's findings. They showed videotapes of other children to children in each of the four sociometric categories and asked the target children to identify the intentions of the children shown in the videotapes. The Rejected and Neglected children were found to frequently mislabel the prosocial intentions of the videotaped children as hostile. Dodge et al. speculated that, given such mislabeling of peers' intentions, Rejected children may be prone to respond aggressively while Neglected children may respond by withdrawing.

Ladd (1983) conducted a playground observation study of third- and fourth-grade children who had been identified as Average, Popular, or Rejected. He found that Popular and Average children generally behaved similarly but that Rejected children showed a very different behavioral style. Rejected children spent less time interacting with peers and rarely engaged in conversation, but were involved in more arguments than were Popular or Average children. The Rejected children, when in a group, tended to be in a smaller group and tended to be with younger

children. Rejected children had fewer reciprocal friends and those children with whom they spent time were often other unpopular children. Rejected boys were found to spend an unusual amount of time with groups of girls.

Work done in the Federal Republic of Germany by Krappmann and Oswald (1983) supports some of Ladd's findings, even though a different methodology was used. Krappmann and Oswald did not use sociometric techniques to identify the groups of children they compared. Instead, they observed first-, fourth-, and sixth-grade children within their respective classrooms. On the basis of the children's behavioral patterns, several peer affiliation styles were delineated. One such style which was found to be especially common among boys was that of the "Rejected Rambler"--the child who moved intrusively from one activity to another without establishing relationships or cooperating with other children in ongoing activities. Unlike most children, Ramblers were seen to often interact with opposite-sex peers, similar to Ladd's (1983) Rejected boys. A second, rarer, group that Krappmann and Oswald identified were "Isolates" who either timidly followed others' actions from a distance or who clung to a desired peer until the peer was overwhelmed by their dependency and withdrew. This group appeared to be similar to the Neglected children in other studies.

Putallaz (1983) observed the behavior of preschool boys as they joined two other boys (one of whom had completed grade 1, the other grade 2) who were already interacting in a lab situation. She found that a young boy's ability to perceive the goals of the ongoing group and to behave in accordance with those group goals was a good predictor of the child's popularity with his classmates once he entered grade 1. Dodge,

Schlundt, Schocken, and Degulach (1983) applied a somewhat similar methodology to study the way in which unacquainted 5-year-olds of different sociometric-status categories entered into interactions with peers. Ten same-sex groups were tested separately. Each group consisted of three "entry" children (one Popular, one Rejected, and one Neglected child) and two Average children. The two Average children in each group were allowed into the playroom first. Five minutes later, one of the entry children was brought into the playroom. The interactions of the three children were observed for six minutes, then the two Average children were escorted to a separate room and asked how many friends they thought the other child had. This procedure was then repeated for the other two entry children in each group. The results showed that Rejected and Neglected children were estimated to have fewer friends than Popular children. Behavioral analyses revealed that Rejected and Neglected children made fewer group-oriented entry statements than Popular children did. Neglected children often hovered near the other two children as if waiting to join the group, and they were usually ignored by the two Average children. Rejected children often interrupted what the other two children were doing and received a negative response from the other two children. Even when the behavior of the entry children was held constant, the Rejected children were greeted with more negative responses than Popular children received. Dodge et al. speculated that the aversive behavior of peers toward Rejected children (regardless of how the Rejected children behaved) might be attributable either to nonbehavioral variables such as unattractiveness or to very subtle behavioral differences which the behavioral code being used was not sensitive to.

In a related study, Dodge (1983) and Dodge et al. (1983) examined the behaviors which appear to lead to a child being identified as Rejected, Neglected, Controversial, Average, or Popular. They organized six play groups. Each group was composed of eight boys, ages 7 and 8, who had not previously met. The boys' behavior was coded as they interacted with one another. After eight free-play sessions together, a sociometric measure was administered to the boys and each boy was then classified as Rejected, Neglected, Controversial, Popular, or Average. The play behavior the boys in each of the five sociometric groups had shown during the eight sessions was then analyzed. It was found that boys who had behaved aggressively and inappropriately and who had rarely engaged in conversation were identified as Rejected. Neglected children had shown little aggression but a lot of generally inappropriate behavior. Controversial boys had exhibited both prosocial and antisocial behaviors. Popular boys were those who had been least likely to terminate an interaction. Two intriguing points regarding peer behavior directed toward each of the five groups were noted. First, it was found that even when Neglected and Rejected children behaved in an appropriate and friendly manner toward peers, peers responded to them negatively. Second, it was found that the Neglected children had frequently interacted with peers during the early play sessions but that after receiving numerous negative responses from peers they gradually showed increasing withdrawal.

Foster and Ritchey (1981) also found that Rejected children received fewer positive responses from peers. Foster and Ritchey identified two Popular, two Rejected, and two Neglected children within each of five grade 4 to 6 classrooms and observed the children's

behavior during classroom activities. It was found that Popular children received significantly more positive initiations from peers than did Rejected or Neglected children. While peers initiated positive interactions with Popular children as frequently as vice versa, Neglected and Rejected children were found to receive only half as many positive initiations as they made. Rejected children made more negative initiations than other children did, but the difference was not significant.

Coie and Kupersmidt (1983) identified Rejected, Neglected, Popular, and Average Black fourth-grade boys and organized play groups consisting of one boy from each sociometric category. Five groups consisted of children who were previously acquainted. Five other groups were composed of boys who were strangers to each other. The groups met weekly for six weeks, during which time the children's behavior was monitored. It was discovered that Neglected boys talked little and were not aggressive. They responded to peers' aversive behavior by withdrawing, and at the end of the six weeks they were rated by the other group members as being shy. When with strangers, the Neglected boys were relatively outgoing, although in groups with children whom they knew they were less socially active. The Average boys were especially talkative and socially active if they were in a group in which they already knew the other group members. Both Average and Popular boys were moderately aggressive. However, the Average boys received aversive behavior from peers while the Popular boys usually did not. The Rejected group were found to talk a lot and were active socially. At the end of the six weeks, the Rejected boys were rated by the other group members as uncooperative and disruptive. They were also

rated as most likely to start fights, even though behavioral observations showed that they were not significantly more aggressive than the Average boys. Additionally, Rejected boys were most frequently aggressed against by peers. Even when put with a new group of peers, the Rejected boys very quickly (within three weeks) were reidentified by the new peer group as being actively disliked and not actively liked.

As well as being stable across groups of peers, Rejected status has been found to be stable over time. Coie and Dodge (1983) identified Rejected, Neglected, Controversial, Popular, and Average children in grades 3 to 5 and collected follow-up data on the sample five years later. The sociometric status of the Rejected group was found to be the most stable. Those Rejected children who had changed status by adolescence had usually shifted to another fairly unpopular category. Very few Rejected children shifted into the Popular group. Rejected children who were initially described by peers as being disruptive and starting fights were least likely to shift from their Rejected status. Membership in the Neglected group was somewhat less stable, and when Neglected children changed status they were likely to shift to the Average group.

Rejected status has been found to predict a number of long-term adjustment difficulties. Kupersmidt (1983) identified Neglected, Rejected, Controversial, Average, and Popular fifth-grade children and followed her sample up seven years later. The Rejected children were found to have significantly more problems throughout adolescence than did children in the other groups. They were more frequently truant, they were likely to fail courses in school, and many dropped out of school. Many also had a history of legal infractions. Of those

children identified as Rejected in grade 5, those who had also been rated by their grade 5 peers as being likely to start fights had the most adjustment problems during the ensuing seven years.

While the sociometric categorization system used to identify Rejected, Neglected, Controverial, Average, and Popular children is obviously quite an effective screening tool, the method has certain limitations. One major concern pertains to the possible negative consequences of asking children to identify the peers whom they actively dislike (Asher & Hymel, 1981; Foster & Ritchey, 1979; Greenwood, Walker, Todd, & Hops, 1979; Peery, 1979). Although it is sometimes feared that the procedure will produce a labeling effect which could cause the disliked children to be further ostracized, research indicates that no such negative effects ensue--particularly if proper precautions are taken such as not administering the sociometric immediately before a recess period when children might be more likely to discuss the nominations they made (Asher, 1983; Hayvren & Hymel, in press). However, many researchers, ethics review boards, and school officials still prefer not to take the risk (Asher & Hymel, 1981; Greenwood et al., 1979).

A second limitation of the method is the finding that it may not be the <u>best</u> technique for predicting future adjustment problems. Kupersmidt (1983) reports that, although negative sociometric status during childhood is a <u>good</u> predictor of problems during adolescence, peer-rated aggression is a <u>more</u> powerful predictor. Because aggression and Rejected status tend to co-occur, it is possible that the aggression is at the root of both the negative sociometric status and the later pathology.

Evaluation of Aggression and Withdrawal

The research strategy of using peer evaluations to identify children with certain behavioral characteristics, such as frequent aggressive behavior, rather than merely using them to name those who are liked and disliked, may prove to be a more effective screening technique. Most studies which have employed this strategy have focused on assessing aggression and/or withdrawal (Ledingham, 1981; Ledingham, Younger, Schwartzman, & Bergeron, 1982; O'Malley, 1977; Olweus, 1980; Rolf, 1972; Shea, 1972; Victor & Halverson, 1976). Overcontrol/internalizing/withdrawal and undercontrol/externalizing/aggression have been factor-analytically identified as the two broad dimensions under which nearly all childhood psychological problems can be classified (Achenbach & Edelbrock, 1978). Their importance as predictors of later maladjustment is highlighted by the fact that they become well-established characteristics of an individual by the early elementary school years (Bloom, 1964; Robins, 1979) and they remain quite stable over time (Eron, 1983; Gersten, Langner, Eisenberg, Smicha-Fagan, & McCarthy, 1976; Loeber, 1982; Morris et al., 1956; Morris, Soroker, & Burruss, 1954; Olweus, 1981, 1979; Rubin, Daniels-Bierness, & Bream, 1984; Victor & Halverson, 1976). Aggression has been found to be almost as stable as IQ (Olweus, 1979) and is especially stable for boys (Bloom, 1964; Olweus, 1981). Withdrawal is less stable than aggression, but its stability is generally still significant (Fischer, Rolf, Hasazi, & Cummings, 1984; Gersten et al., 1976; Morris et al., 1954; Olweus, 1981; Victor & Halverson, 1976), especially after grade 4 (Moskowitz & Schwartzman, 1983). Withdrawn children in Moskowitz and Schwartzman's sample were found to become even more withdrawn over time, while the

highly aggressive children in the sample maintained a relatively consistent level of aggression.

Aggression and/or withdrawal have been reported to predict a variety of problems. Bower (1969) found that a large percentage of boys identified by school guidance counselors or psychologists as being psychologically disturbed were later independently rated by their teachers as being aggressive and/or withdrawn. Janes and Hesselbrock (1978) similarly found that teachers described boys seen at a child guidance clinic as disobedient and disagreeable, while they described girls being treated at the clinic as withdrawn and depressed. When followed up 9-15 years later, the clinic children who did not get along well with peers were found to be the most poorly adjusted as adults. Additionally, frequent involvement in fights was among the variables that predicted poor adult adjustment for boys while withdrawal and temper displays predicted poor adult adjustment for girls. Fischer et al. (1984) found that a high frequency of unsocialized aggression in a preschool-aged child is a moderately good predictor of a low level of social competence several years later. Numerous studies have linked aggression and/or withdrawal to later psychiatric hospitalization (Birren, 1944; Mellsop, 1973; Michael, Morris, & Soroker, 1957; Morris et al., 1956; O'Neal & Robins, 1958a, 1958b; Pollin & Stabenau, 1968; Ricks & Nameche, 1966; Roff et al., 1976; Rolf, 1976; Shea, 1972; Warnken & Seiss, 1965; Watt, 1972; Watt & Lubensky, 1976; Watt et al., 1970; Weiner, 1970; Wittman & Steinberg, 1944; Woerner, Pollack, Rogalski, Pollack, & Klein, 1972).

Several sources suggest that it is children who are <u>both</u> aggressive and withdrawn who are at the greatest risk for future psychopathology.

George and Main (1980) reported that abused infants and toddlers show a pattern of alternating aggression and withdrawal, and suggest that these children are themselves at risk of becoming child abusers when they later have children of their own. Associated Press (1982) reported Kellam's finding that first-grade boys who are both shy and aggressive are most likely to later become substance abusers. In a follow-up study of boys originally seen at a child guidance clinic 14-29 years earlier, Michael et al. (1957) examined whether internal reactors (shy, withdrawn boys), external reactors (characterized by unsocialized aggression), or mixed reactors (boys who were both aggressive and withdrawn) were most likely to have become schizophrenic as adults. He found that a high percentage of the mixed reactors had become schizophrenic, while only a moderate number of the external reactors and very few internal reactors developed schizophrenia. Current work by Ledingham, Schwartzman, and colleagues (e.g., Ledingham, 1981; Ledingham et al., 1982; Ledingham & Schwartzman, 1984) is based on the hypothesis that children high in both aggression and withdrawal are at risk for later schizophrenia. While Ledingham's Aggressive-withdrawn subjects have yet to be shown to develop schizophrenia, the Aggressive-withdrawn children in her studies have been found to be more deviant than purely Aggressive or purely Withdrawn children on a number of measures, as well as being more deviant than nonaggressive-nonwithdrawn Contrast subjects (results of these studies are described in more detail below).

While many studies have focused on the lasting difficulties that inappropriate aggression and withdrawal may signal, a number of other studies have emphasized the fact that both aggressive and withdrawn behavior can be modulated. Hartup (1979) reviewed the literature on

ways to promote social competence and concluded that both aggressive and withdrawn behavior patterns can be effectively altered through social reinforcement given by adults and peers, through modeling, though coaching, and possibly through peer tutoring in appropriate social behavior. Conger and Keane (1981) reviewed the literature on treatment for withdrawn behavior and similarly concluded that modeling and coaching appear to be effective ways of altering the behavior of isolated and withdrawn children. It may be important, however, to implement such intervention strategies at an early age, since aggressive and withdrawn behavior patterns seem to become more rigidly consolidated with age (Anthony, 1968; Asarnow, 1983; Bloom, 1964; Olweus, 1981). Thus, the importance of early identification of children who are at risk by virtue of their aggressive and/or withdrawn behavior becomes evident.

However, recent research has demonstrated that this is not entirely straightforward. Not all forms of aggression and withdrawal have equal predictive validity. In some cases, aggressive behavior is positively correlated with popularity (Green & Forehand, 1980; Hartup, 1970; Ledingham, 1981) and better adjustment (Birren, 1944). In defining aggression, it is first of all important to differentiate appropriate from antisocial aggression (Anderson & Messick, 1974; Benn & Garbarino, 1981; Minturn & Lewis, 1968; Waldrop & Halverson, 1975; White, 1975). It is also important to recognize that aggression is expressed in different forms at different ages. Elementary school children are more likely to display overt fighting and disobedience while adolescents tend to be antisocial in more covert ways, including theft and substance abuse (Loeber, 1982). Behavior which is acceptable at one age may be seen as unacceptable later, and vice versa (Minturn & Lewis, 1968).

Similarly, childhood withdrawal does not always predict later psychopathology. Rubin et al. (1976) observed the free play behavior of 3- and 4-year-old children and found that solitary play at that age did not signify immaturity or maladjustment, but rather was often time the child used creatively to develop new skills. Morris et al. (1954) conducted a 16-27 year follow-up study of withdrawn children seen earlier at a child guidance clinic. They found that although the 54 subjects studied remained quiet and somewhat withdrawn as adults, virtually all were functioning very well. Most had found ways to compensate effectively for their shyness. It is necessary to question, therefore, whether we need to be concerned about possible adverse effects of childhood withdrawal. The fact that all the subjects in Morris et al.'s sample had received some degree of clinical attention for their withdrawal during childhood must be kept in mind, however. Morris et al.'s findings may not generalize to children who received no help in learning to deal with their shyness.

Weintraub and Neale (1978) reviewed the literature on childhood withdrawal as a predictor of adult schizophrenia. They concluded that although retrospective studies suggest that schizophrenic patients were withdrawn during childhood, prospective longitudinal studies find no evidence to indicate that withdrawal in childhood signals high risk for adult schizophrenia.

Controversy as to whether or not withdrawal is a problem meriting therapeutic intervention may stem from a failure in early studies to define it consistently. Asher and Hymel (1981), Asher, Markell and Hymel, (1981), and Conger and Keane (1981) have reviewed the literature on childhood withdrawal and stress the importance of evaluating the

quality, rather than quantity, of interactions. They differentiate two forms of social isolation--(1) isolation in the form of a low frequency of interaction ("true" withdrawal), and (2) isolation which is due to rejection by peers (as assessed using sociometric procedures, as discussed above). Gottman (1977) has argued that a low frequency of interactions may be a relatively superficial problem and no cause for alarm, but that withdrawal due to rejection is a good predictor of later maladjustment. Hymel and Rubin (in press) suggest that both forms of isolation may predict difficulties, but that the nature of such problems will be different for each of the two groups. They speculate that rejection may predict later conduct disorders and delinquency, whereas Neglected/Withdrawn children may suffer low esteem, experience social anxiety, and be at risk for depression.

One method of assessing aggression and withdrawal which has shown itself to be an effective screening tool is a peer nomination procedure developed by Neale, Weintraub, and colleagues specifically for the purpose of identifying children at risk for later psychopathology (Neale & Weintraub, 1975; Pekarik, Prinz, Liebert, Neale, & Weintraub, 1976). Their Pupil Evaluation Inventory (PEI) provides scores on Aggressive/disruptive and Withdrawn dimensions, as well as yielding a Likability score. It also minimizes the ethical difficulties which many sociometric procedures entail by not asking students whom they actively dislike.

The PEI has frequently been used to identify five groups of children. Aggressive children are defined as those who are frequently nominated for items on the Aggression/disruption scale but are rarely nominated in response to items on the Withdrawal scale. Conversely,

Withdrawn children are those who receive a high score on the Withdrawn scale but a low score on the Aggressive/disruptive scale. Aggressive-withdrawn children are those children who are frequently nominated for items on both dimensions. Control (or Contrast) children are selected in different ways in different studies. In some studies, they are the children who score near the norm on both scales (Moskowitz & Schwartzman, 1983). In other studies, they are those who score either near the mean or very low on both Aggression/disruption and Withdrawal (Ledingham, 1981; Ledingham et al., 1982; Ledingham & Schwartzman, 1984; Schwartzman, Serbin, Lyons, Younger, & Ledingham, 1982). Undifferentiated children are simply those children whose scores do not meet the requirements for one of the other four groups. Usually only the first four groups are studied, while the various children classified as Undifferentiated are not followed-up. Likability scores are not used in this classification system. Instead, they are generally used to provide descriptive data.

Of the four usually-studied groups, the Aggressive-withdrawn group is particularly interesting. What clinical meaning does such a categorization hold? Do such children actually manifest high frequencies of aggressive and withdrawn behavior? If so, do they vacillate unpredictably between violent, explosive behavior and withdrawn or isolated behavior? Are behavioral shifts determined by identifiable environmental influences? Do such children somehow exhibit a blend of aggressive and withdrawn behaviors simultaneously? Is their aggression expressed in the same way as children in the Aggressive group display aggression? Does their withdrawal resemble that of Withdrawn children, or is it expressed differently?

Alternatively, do Aggressive-withdrawn children get nominated for any negative-valence item on the PEI simply because they are disliked by peers, without actually evidencing high levels of aggression or withdrawal? If so, what does cause peers to dislike them? Data suggesting answers to these questions are very limited at present. Ledingham (1981) and Ledingham et al. (1982) found that Aggressive-withdrawn children were often rated as less popular than Aggressive and Control children, and that older Aggressive-withdrawn children received even lower Likability scores than younger Aggressive-withdrawn children. Ledingham (1981) also found that both mothers and teachers rated the Aggressive-withdrawn children as more deviant than Aggressive, Withdrawn, or Control children. In addition, Aggressive-withdrawn children were more likely than Withdrawn or Control children to have failed a grade or been placed in a remedial class (Ledingham & Schwartzman, 1984).

Milich and Landau (1984) modified some of the PEI items to suit a kindergarten population. They then administered the shortened adaption of the PEI to 49 boys, along with questions regarding liked and disliked peers. It was found that the Aggressive-withdrawn boys fit the criteria used to identify Rejected children in the sociometric studies discussed above. The Aggressive-withdrawn boys were rarely named as being liked and were often nominated as disliked. In addition, teachers rated them as much more hyperactive than other children.

In sum, there is a growing body of research documenting the effectiveness of peer evaluations in general, and of the PEI in particular, in identifying children who are showing early signs of psychosocial difficulty and are at risk for even more serious pathology

as they mature.

Need for Behavioral Observation

While sociometrics and peer evaluation questionnaires have been shown to be very useful in identifying children who have difficulties relating well with peers, they fall short in their ability to specify the precise behavioral characteristics which differentiate children who are described negatively. This is particularly true when a sociometric asks broad questions such as "Who do you like? Who do you not like?" (Gresham, 1981; Peery, 1979). Such measures may yield scores on popularity, rejection, and the degree to which a child is ignored by peers, but they do not describe the specific characteristics of the child. Measures such as the PEI ask children to nominate their classmates on the basis of more specific descriptions such as "Those who are too shy to make friends easily" or "Those who are mean and cruel to other children", but even items of this type are too global to really help researchers identify the critical social skills which children at risk are lacking. Such measures, therefore, are useful only for classification purposes and not for treatment planning (Conger & Keane, 1981; Foster & Ritchey, 1979; Greenwood et al., 1979). In order to identify the specific behaviors associated with social competence, their situational context, and their functional consequences, it is necessary to turn to naturalistic observation (Conger & Keane, 1981; Foster & Ritchey, 1979; Gottman, Gonso, & Rasmussen, 1975; Greenwood et al., 1979; Gresham, 1981; O'Malley, 1977; Peery, 1979).

To date, the majority of studies which have found significant correlations between sociometric status and interpersonal behavior have been studies looking at preschoolers rather than at elementary school

children. Asher and Hymel, in their 1981 review article, have argued that the failure of most studies of school-aged children to find significant relationships between status and behavior is due to situational constraints. Daycare/preschool classrooms provide a handy and effective setting for observing children interacting with their peers. Once children are in elementary school, however, class time tends to be quite structured and thus precludes free interaction. Aggression in general, and girls' aggression in particular, tends to be inhibited under such conditions (Barrett, 1979). Therefore, it may be very inefficient to attempt to study interpersonal competence in the classroom where the task at hand pertains more to learning and cooperating with authority than to friendship-making and managing aggression (Asher & Hymel, 1981; Garber, 1984; Hartup, 1976). It is when activity is less structured, as during free play, that individual differences and social skills deficits become evident (Bond, Kelly, Teti, & Gibbs, 1983; DiPietro, 1981; Kendall, Lerner, & Craighead, 1984). School recess periods, therefore, although they represent a smaller fraction of the child's day, may provide a more appropriate setting for examining the way older children interact with one another. Consequently, among studies of school-aged children, the studies that have been most successful in identifying behaviors which correlate significantly with sociometric status are the ones which have included observational data collected outside of the classroom setting (Asher & Hymel, 1981). In spite of this, however, very few studies have looked at the playground behavior of grade-school children (Foster & Ritchey, 1979; Ladd, 1983). A likely reason for the scarcity of such studies is the fact that such data are very difficult to collect due to the brevity

of children's recess periods (Hymel & Rubin, in press), especially at city schools where children usually go home for lunch rather than taking their lunch break at the school.

Purpose and Hypotheses of the Present Study

The present study was designed to help fill some of the gaps in our knowledge about the play behavior of older children, and about children who are aggressive and/or withdrawn in particular. The PEI was used in the present study to obtain peer nominations focusing on the two primary behavioral dimensions of Aggression/disruption and Withdrawal. On the basis of the PEI screening, three groups of school-aged children who showed atypical social interaction patterns were identified--(1) those children who showed extreme amounts of aggression but were not withdrawn, (2) those children identified as extremely withdrawn but not aggressive, and (3) those children identified by their peers as high on both aggression and withdrawal. The playground behavior of these three groups of at-risk children was then contrasted with that of a control group of children whose aggression and withdrawal scores fell near the class average.

Five main questions were examined in this study. First, the study provided validation information pertaining to the PEI nomination procedure used by Ledingham (1981), Ledingham et al. (1982), Moskowitz and Schwartzman (1983), Neale & Weintraub (1975), and Schwartzman et al. (1982) to identify Aggressive, Withdrawn, and Aggressive-withdrawn children. Without observational validation of the procedure, it had been assumed that the groups differed in interaction style but the literature shows that such an assumption could be unwarranted. Green, Beck, Forehand, and Vosk (1980), for example, were unable to

behaviorally differentiate children teachers had classified as withdrawn from those classified as conduct disordered. Bolstad and Johnson (1977) were able to behaviorally distinguish teacher-classified disturbed versus healthy boys but could not behaviorally classify girls. Greenwood et al. (1979) found high correlations between teacher ratings and behavioral observations, but did not find significant correlations between peer ratings and observations. Thus, behavioral validation of the PEI is an important task.

The study's second purpose was to determine the precise way in which the three deviant groups differed from each other and from the contrast group. Several studies have argued that Aggressive-withdrawn children are at a higher risk for psychopathology than are children who are purely withdrawn or purely aggressive (Associated Press, 1982; George & Main, 1980; Ledingham, 1981; Ledingham et al., 1982; Michael et al., 1957; Neale & Weintraub, 1975). Thus the Aggressive-withdrawn group was apt to be the one most in need of early intervention programs. Yet it was not known what type of intervention was appropriate for dealing with Aggressive-withdrawn children, since no published study has focused on the treatment of such children. There was reason to believe (Milich & Landau, 1984), that Aggressive-withdrawn children would <u>not</u> merely show a combination of the behaviors which Aggressive and Withdrawn children would show, but rather would exhibit a distinct behavioral pattern. Thus, although numerous studies have evaluated various treatment programs for Aggressive and for Withdrawn children (Cowen, Dorr, Trost, & Izzo, 1972; Hartup, 1970, 1979; Strain, 1977), such interventions might be totally inappropriate for Aggressive-withdrawn children. In order to move toward determining what type of

behavioral intervention could best aid Aggressive-withdrawn children, it was necessary to begin by specifying the precise behaviors which set Aggressive-withdrawn children apart from the other three identified groups (Greenwood et al., 1979; O'Malley, 1977).

In order to propose specific hypotheses as to how the four groups would differ, the present study operated under the preliminary assumption that the Aggressive, Withdrawn, Aggressive-withdrawn, and Contrast groups studied here had much in common with Controversial, Neglected, Rejected, and Average children studied by others. Milich and Landau (1984) originally put forth this suggestion, based on sociometric and observational data collected by themselves and others. They found that while aggression and popularity (likability) do not consistently correlate (cf. Ledingham, 1981; Ledingham et al., 1982 vs. Bierman & Allen, 1983; Cowen, Lorion, & Wilson, 1976), aggression and rejection do correlate significantly. Hartup had reported the same phenomenon earlier in his 1970 review of the literature pertaining to aggression, but Milich and Landau took the evidence one step further to propose an explanation. They suggested that two types of aggressive children exist--one group (Aggressive-withdrawn) that is uniformly disliked (similar to children identified as Rejected) and a second (Aggressive) group that is liked by some peers and disliked by others (as are children identified as Controversial). Taking Milich and Landau's idea a step further, Withdrawn children were assumed to most closely resemble Neglected children. This premise was supported by Coie and Kupersmidt's (1983) finding that Neglected children do tend to be labelled by peers as being shy (withdrawn). The Contrast group, selected in this study on the basis of PEI scores close to the class

mean, was expected to resemble Average children or possibly Popular children.

On the basis of these assumptions and the findings of previous research, a number of specific hypotheses were postulated. Aggressive children were expected to incite and retaliate various forms of aggression quite frequently (Dodge, 1983; Hartup, 1970; Milich & Landau, 1984; Waldrop & Halverson, 1975) and to rarely be alone (Dodge, 1983). They were also expected to be involved in numerous positive interactions (Dodge, 1983; Milich & Landau, 1984), as seen in large amounts of time spent in play and/or high levels of attention to peers (Dodge, 1983).

Withdrawn children were predicted to spend more time alone and less in play (Asher et al., 1981; Coie & Kupersmidt, 1983; Greenwood et al., 1982; Milich & Landau, 1984). They were not expected to be involved in much aggression (Coie & Kupersmidt, 1983; Dodge, 1983). When aggressed against, they were expected to be unlikely to respond by retaliating aggressively (Coie & Kupersmidt, 1983). They were also predicted to be unlikely to give attention to or to seek attention from peers (Greenwood et al., 1977, 1979; 1982). Intuitively, they were expected to be the least active physically.

Aggressive-withdrawn children were expected to differ most from the other groups (Ladd, 1983). The assumption that Aggressive-withdrawn children would resemble Rejected children suggested that Aggressive-withdrawn children would be characterized by their efforts to intrude upon the ongoing activities of others without actually engaging in shared activities with peers (Dodge, 1983; Krappmann & Oswald, 1983; Putallaz, 1983). It also suggested that they would spend less time in play (Coie & Kupersmidt, 1983; Dodge, 1983; Ladd, 1983; Putallaz, 1983)

or with a group (Asher et al., 1981; Ladd, 1983) than would Aggressive or Contrast children. They were expected to be involved in aggression (Dodge, 1983) but not necessarily more than Contrast children (Coie & Kupersmidt, 1983). When aggressed against, however, they were expected to be most likely to retaliate (Coie & Kupersmidt, 1983; Dodge, Murphy, & Buchsbaum, 1984). They were expected to seek peers' attention, often in inappropriate ways (Dodge, 1981; Greenwood et al., 1977; Krappmann & Oswald, 1983; Putallaz, 1983). Because they were predicted to be frequently rebuffed by peers, they were expected to spend much time hovering near peers (Asher et al., 1981; Gottman, 1977; Greenwood et al., 1977; Krappmann & Oswald, 1983; Ladd, 1983). It was predicted that they would also spend more time in cross-sex interactions (Krappmann & Oswald, 1983).

Contrast children were expected to spend at least half of their time in play, to give high levels of attention to peers, and to make moderate attempts to elicit peers' attention (based on Ladd's observations of the behavior of Popular and Average children, 1983). They were expected to be quite aggressive, based on Coie & Kupersmidt's (1983) finding that Average boys are just as aggressive in their play behavior as Rejected boys.

The third purpose of the study was to examine the role peers played in eliciting and/or reinforcing abnormal behavior patterns in the deviant groups. Mednick (1966) has suggested that the high-risk child is atypical by nature and that this causes the child to be rejected by peers. This would seem to coincide with the data Milich and Landau (1984) collected on a small sample of preschool boys. Cowen et al. (1973), Hartup (1976), Strain (1977), and Benn and Garbarino (1981),

however, have emphasized the role that peers play in generating or exacerbating aggressive or withdrawn behavior in a child. General social status might also be maintained by differences in peer response to the target child (Coie & Dodge, 1983; Foster & Ritchey, 1981; Gottman et al., 1975; Green & Forehand, 1980; Musser & Graziano, 1983).

It was hypothesized that the Aggressive group, for example, would be characterized by receiving high levels of peer attention (Dodge, 1983). The Withdrawn group was expected to receive very little attention from peers (Dodge, 1983; Foster & Ritchey, 1981; Greenwood et al., 1979, 1982). Aggressive-withdrawn children were predicted to receive little peer attention overall (Dodge, 1983; Foster & Ritchey, 1981; Greenwood et al., 1977) but to be subjected to frequent aggressive attacks by peers (Coie & Kupersmidt, 1983; Dodge, 1983; Foster & Ritchey, 1981). Contrast children were expected to receive moderate levels of peer aggression and high levels of attention from peers (Dodge, 1983; Ladd, 1983).

Fourth, sex-differentiated behavior patterns within the four groups of children were examined. It has been fairly well established that some disorders, such as schizophrenia, have very different premorbid signs among girls than among boys (e.g., Gardner, 1967; Lewine, 1981; Lorr & Jenkins, 1953; Watt, 1972; Watt & Lubensky, 1976; Watt et al., 1970). Different behavioral and affiliation patterns might be adaptive for boys than are for girls (Victor & Halverson, 1976; Waldrop & Halverson, 1975). Particularly, some forms of aggressive behavior might be considered by peers to be appropriate for boys versus girls (Maccoby & Jacklin, 1980; Benn & Garbarino, 1981).

In the present study, it was expected that boys would show more

aggressive/rough and tumble activity than girls (Eme, 1979; Hartup, 1974; Ladd, 1983; Maccoby, in press; Williams, Joy, Kimball, & Zabrack, 1983). This sex difference was expected to be especially prominent among Aggressive-withdrawn children (Ladd, 1983). Intuitively, it was predicted that boys and girls would use different behavioral patterns to express their aggression. It was anticipated that a larger percentage of boys' aggression would be in the form of punches, while girls would show a larger percentage of slaps. Boys were expected to spend more time in play while girls were expected to spend more time proximal to peers, in conversation, etc. (Ladd, 1983). While other boys were expected to spend more time in groups than girls (Maccoby, in press), Aggressive-withdrawn boys were expected to spend little time in groups (Ladd, 1983; Waldrop & Halverson, 1975). Boys in general and Aggressive-withdrawn boys in particular were expected to spend more time in cross-sex interactions than girls (Ladd, 1983). While boys in all groups were expected to be more physically active than girls (Block, 1976; Eme, 1979), based on information regarding characteristics associated with high risk, Aggressive-withdrawn boys were expected to show an unusually high motor level while Aggressive-withdrawn girls were predicted to be low in activity level (Victor & Halverson, 1975).

Finally, the possibility that peers would respond differently to male versus female target children was examined. It was predicted that peers would retaliate to a greater percentage of aggressive attacks by boys than by girls (Fagot, in press; Benn & Garbarino, 1981).

Method

Ethical Precautions

All procedures for subject selection and data collection used in this study were approved by the university's ethics review committee, as well as by the school board, the teachers, and the parents' committees at the schools involved. When questionnaires were administered and photographs taken, all children in the appropriate grades were involved so that the identity of the specific target children being studied was not revealed. Similarly, the children were aware that they were being videotaped while on the playground but since nearby peers were also videotaped, they had no way to know that specific children had been selected as targets. At the first of the two schools in which the study was conducted, even the teachers did not know which children had been selected as subjects. At the second school, teachers knew which children were targets because they completed checklists on the selected children as part of a separate study. The teachers did not know, however, whether an individual child had been identified as Aggressive, as Withdrawn, as Aggressive-withdrawn, or as a Contrast subject.

The results of this project have been reported to the teachers and school boards involved. Only group, sex, and school differences have been analyzed. Individual differences have not been and will not be analyzed, and no feedback on individual children was given to the teachers.

Subject Selection

Two elementary schools in the Montreal French-language school system participated in the study--School 1 during 1981-82, and School 2 during 1982-83. At each school, the two oldest grades of children were

studied. At School 1, the subjects were children in grades 5 and 6. At School 2 the subjects were children in grades 4 and 5 . The grade 4 to grade 6 age range was selected because previous research had shown that by grade 4, children have coherent constructs for labeling both aggression and withdrawal (Schwartzman et al., 1982). It is also at approximately this age that a relatively balanced distribution of Aggressive, Withdrawn, and Aggressive-withdrawn children can be found (Ledingham, 1981). Additionally, behavior is more stable among older children than it is at earlier ages (Hartup, 1970), and deviations from the norm appear to predict adult pathology more clearly among older children (Garber, 1984).

A French translation of the PEI was administered within each classroom of the grades involved. The PEI consists of 35 items which load on the three factors Aggression/disruption, Withdrawal, and Likability. (See Appendices A and B for French and English copies of the PEI.)

Children within each classroom were provided with a list of their classmates' names and corresponding identification numbers. During the classroom administration of the PEI, each child was asked to complete the questionnaire twice--once to nominate up to four male classmates for each characteristic the questionnaire describes, and a second time to nominate up to four female classmates for each item. The child could nominate himself/herself for an item if he/she so chose.

The number of nominations each child received on each of the three scales (Aggression/disruption, Withdrawal, and Likability) was tallied and a square-root transformation was performed on each of the sums to minimize skew. The scores were then converted to standard Z scores for

each sex within each classroom. Thus, each child's scores were calculated relative to same-sex classmates, rather than cross-sex or cross-classroom baselines being used. The Z scores on the Aggression/disruption and Withdrawal factors were then used to select subjects for the four target groups--Aggressive, Withdrawn, Aggressive-withdrawn, and Contrast. Table 1 outlines the distribution of target subjects by grade, sex, and school.

The subjects for the Aggressive group were selected from among those with the highest Z scores on the Aggression/disruption factor, but with Withdrawal scores below +0.68 (the 75th percentile). An effort was made to select subjects who were approximately evenly distributed among grades and classes, and across sex. The majority of the 29 subjects designated as Aggressive had Z scores above +1.65 (the 95th percentile) on the Aggression/disruption factor, but 11 subjects (9 males, 2 females) with lower Z scores were included to increase the sample size at specific age levels for each sex. The lowest Z score on Aggression/disruption among children included in this group was +1.26 (the 90th percentile). (See Table 2 for mean Z scores for each group.)

Withdrawn subjects were selected from among those with the highest Z scores on the Withdrawal factor but with Aggression/disruption scores below +0.68. The majority of the 27 subjects in the Withdrawn group had Z scores above +1.65 on the Withdrawal factor, but nine subjects (three males, six females) with lower scores were included to attain a distribution of subjects across sex and grades. Again, the lowest score included was +1.26.

The Aggressive-withdrawn group was made up of subjects selected from among those with high Z scores on both Aggression/disruption and

Withdrawal. The majority of subjects in this group had Z scores above +0.68 on both scales. Two boys from School 1 who had lower Z scores were included, however. The lowest set of scores was +0.55(A)/+0.67(W) (the 71st percentile on Aggression and the 75th percentile on Withdrawal).

Contrast subjects in the present study were selected from among those children whose Z scores on both Aggression/disruption and Withdrawal fell between -0.68 and +0.68. One or two such children were selected from each classroom, with an effort being made to select those subjects whose scores on both Aggression and Withdrawal were of approximately the same magnitude and preferably close to zero. This procedure is in contrast to that used by Ledingham (1981) and Ledingham et al. (1982), who randomly selected comparison children from among those whose Z scores were below +0.68. Ledingham's strategy was avoided since it included children who received atypically low scores on Aggression/disruption and Withdrawal. While such scores might mean that the children were extremely extroverted and nonaggressive, it could also mean that they were simply overlooked or relatively unknown by their peers. Thus the present study chose to select as Contrast subjects those children who scored near the mean on both Aggression/disruption and Withdrawal.

PEI Likability scores were not used in subject selection. However, they are presented in Table 3 to document the fact that the Aggressive-withdrawn children were least popular and Contrast children were most popular. Since the PEI Likability scale contains only positive-valence items ("help others", "are liked by everyone", "are your best friends", "are especially nice", "always seem to understand things"), it was not

possible to differentiate "neglected" from "rejected" children. The fact that Aggressive-withdrawn children received the fewest nominations on the Likability scale, however, was consonant with the premise that Aggressive-withdrawn and Rejected children might be very similar.

Photo Identification of Subjects

To facilitate identification of target subjects on the playground, photographs were taken of all children in the classes involved. Two sets of pictures were taken--one in which the children wore indoor clothing, and a second in which they wore winter coats, hats, scarves, mitts, etc. Camerapersons used the photos to memorize which children to videotape, and to later verify the identity of the children on tape. second set of identical pictures was given to each class to thank the teachers and children for participating in the photo sessions.

Filming Procedures

The author, another graduate student, an undergraduate honours student, and five research assistants videotaped the children during outdoor recess periods. Because approximately 300 children were on the playground at one time and some children were as far as 70 meters away, it was often time-consuming to locate a specific target child. Therefore, each video crew consisted of two members. A "spotter" located the target children using binoculars and the children's photographs, and timed each video segment using a stopwatch. The "cameraperson" operated the telephoto color video camera and portable video cassette deck.

In order not to intrude upon the children's free play, the video crews positioned themselves in second story windows, overlooking the playground. The children were generally aware that people were

videotaping the playground daily, but were unable to tell which children were being videotaped. To the extent possible, subjects were videotaped on a rotating schedule. Because some children often played too close to the building to be videotaped from above, or played around the corner of the building, a few segments were videotaped from ground floor windows or from a car parked outside the playground fence.

Microphones were not used on the playground since their presence would have been more intrusive than was desired. Thus, it was not possible to record the content of any verbal interactions and it often was impossible to tell whether children were conversing or not.

Children at both schools had outdoor recess 12-15 minutes each morning and 10-15 minutes each afternoon, weather permitting. The first segment on each subject videotaped at School 1 was at least 4 minutes in length. Because it proved to be very difficult to obtain segments this long (due to the high mobility of some subjects and due to the limited duration of the recess period), and because shorter segments subjectively seemed to be as representative of the children's behavior, all subsequent segments were approximately 2 minutes in length.

School 1 subjects were videotaped an average of 3.2 times (SD = 0.6) during the 1982 spring semester. Since the first segment on each child was a minimum of 4 minutes and subsequent segments were at least 2 minutes long, an average of between 8 and 9 minutes of data were collected per subject at School 1. Two subjects were videotaped only twice (approximately 6 minutes total), however, and two subjects were videotaped as much as five times (more than 12 minutes total).

School 2 subjects were videotaped during both fall and spring semesters of 1982-83. An average of 13.7 2-minute segments (SD = 0.9)

were collected for each child. Thus an average total of approximately 28 minutes of data were collected per subject. The number of segments per subject ranged from 12 (five subjects) to 16 (two subjects).

These quantities of data compare well with past studies. Green et al. (1980) scored approximately 8 minutes of observation per child. Gresham (1981) coded only every tenth second of 30 minutes for a total of 180 coded seconds. Gottman (1977) scored 8 minutes per child. Hartup, Glazer & Charlesworth (1967), Rubin et al. (1976), and Rubin, Watson, & Jambor (1978) each coded 30 minutes per child.

After all the segments were coded the stability of the children's behavior across segments was assessed using the reliability coefficient Chronbach's alpha. At School 1, the alpha coefficients were based on the data of the 41 children for whom three segments of behavior had been videotaped. At School 2, the coefficients were based on the first 12 segments videotaped for all 74 subjects. In addition, the stability of the three segments at School 2 which had been videotaped at the same time of year as the three segments at School 1 was analyzed. As shown in Table 4, composite variables (e.g., total play) were fairly stable across observations, but individual subcategories of behavior (e.g., play with a same-sex peer) were less stable. Based on only three samples of behavior, the alpha coefficients for nearly all of the composite variables at each school exceeded +.30. When stability across 12 segments was assessed, it was found that nearly all of the coefficients for major variables exceeded +.60. This indicates that the number of segments videotaped was sufficient to provide a fairly stable picture of the children's behavioral styles.

Preparation of tapes for coding

Each segment of tape was recorded in a log book which listed the child's identification number, date videotaped, beginning and ending footage of each segment, and length of the segment in seconds. The target's identification number and physical description were recorded on the audiotrack of the videotape. Also dubbed onto the audiotrack were cues to signal coders when to start and stop coding each segment, and when to input each of the four interval ratings made during the final pass of the tape (see below).

Development of the observational code

Using the videotapes from School 1, a scoring system was developed to quantify the behaviors we wanted to examine. All individuals working on the task of code development were blind as to the peer-identified category to which each subject being observed belonged.

The code which was developed focused both on the target child's behavior (time spent in social play, time with peers outside of play, time alone, frequency of aggression and other physical contact, level of involvement with peers, efforts to elicit attention from peers, and level of physical activity) and on peers' behavior which was directed toward the target (frequency of aggression and other physical contact, involvement with the target).

Some categories of behavior were included because past research suggested their relevance to the present study. The qualitative measures of interpersonal involvement were included in light of previous reports that such measures tap constructs similar to those measured by peer questionnaires and have greater predictive validity than frequency counts of interactions do (Asher et al., 1981; George & Main, 1980;

Gottman, 1977; Gresham, 1981). Asher et al. (1981) and Gottman (1977), for example, found that qualitative measures of level of actual involvement with peers were more meaningful in detecting interactional problems than a quantitative measure of frequency of interaction was. Measures of time spent in play, with peers versus alone, and with same versus opposite sex peers, as well as frequency counts of aggressive incidents and an index of motor activity were included to test the hypotheses outlined in the introduction. The frequency of "touches" was not included in the code in response to a specific hypothesis. Instead, it was included in an effort to force coders to differentiate between aggression/rough and tumble activity and more restrained forms of physical contact, and thus reduce the possibility that coders would be overinclusive in what they labeled as aggression/rough and tumble play. (Because in many cases it was not possible to determine the subjects' intentions, forceful physical contact which occurred during play was tallied here under the aggression category.)

Some categories which appeared intuitively related to aggression and withdrawal were deleted during pilot work for practical reasons. Scoring frequency of "approaches" and "departures" was found to be both difficult and of limited meaning in the relatively crowded and fast-moving context of the playground. Loss of the approach category may not be particularly important, however, since Coie and Kupersmidt (1983) found that number and type of social initiations did not correlate with social status variables. Scoring amount of time spent in conversation was similarly found to be unfeasible since many of the children were videotaped from a distance of 70 meters and often had their back to the camera for much of the time.

Because of the complexity of some of the categories being scored and due to the fact that some behaviors began simultaneously, coders scoring the tapes viewed each video segment four times. The first time, the coder focused on identifying which child was the target and became familiar with the context of the segment. During the second pass, the child's play status was coded, with duration of (1) play, (2) nonplay but proximal to peer, and (3) time alone being recorded. Whether the subject was with a group or a single peer, and the sex of the peer(s) were also recorded. The frequency of contact (touch, aggression incited, aggression retaliated) was scored for target and peers during the third pass. Motor level and three forms of involvement with others were rated on a rotating basis at every fourth 7-second interval during the final pass. (See Appendix B for a complete description of the code. See Appendix C for a detailed outline of the coding procedure.)

Observer Training

Six observers, ages 22 to 26, took part in the study. Three were male, three female. All were university students. Once the final version of the code had been developed, the six observers were trained using approximately the first 10% of the videotapes. Observers were first trained to use the code by recording their observations on paper. When they were fairly proficient at that, they were then trained to code using MORE data-microprocessing units (Observational Systems, Seattle, WA). Frequency counts of physical contact and ratings of involvement and motor activity could be scored directly using the MORE's keyboard, while duration of social play, proximity to peers outside of play, and time spent alone were scored using the MORE's toggle switches which

control internal timing clocks. During training, the effective percentage of interobserver agreement was calculated using the equation:

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

Agreements of nonoccurrence were not included in the calculations, since they would have greatly inflated the rates calculated when the behavior in question was a relatively rare one, such a slap or a punch (Hartmann, 1977).

Within a few weeks of beginning training, observers reached a +.80 level of interobserver agreement across most behaviors. In spite of extensive training and weekly meetings at which all observers met to discuss coding definitions and reliability issues, agreement on some categories remained consistently below the desired +.80 level. The behavioral categories which yielded the poorest interobserver agreement were Slap, Punch, and certain Play/Proximity sub-categories. The difficulty regarding these variables was that they occurred extremely rarely. Observers therefore had less practice coding them, and even a few disagreements in coding represented a large percentage of the data on these categories. The other category which proved difficult to code was Touch. This was not because touches were rare, but because it was often difficult to determine whether one child had actually brushed against another or not, since the depth of field in the videotapes was very limited.

In light of these coding difficulties, the decision was made to have each segment of videotape coded by two randomly-paired observers. The data from the two coders was then averaged. The average score, rather than the raw scores from each coder, were then used in all

analyses. Moskowitz and Schwarz (1982) found that averaging across multiple coders in this way helps to reduce error variance and thus increases the reliability and validity of the data.

Coding of the Tapes for Data Analysis

Once the observers had reached a +.80 level of interobserver agreement across most categories (as discussed above), training was considered complete. All tapes coded during training were recoded and all subsequent tapes were coded. The data each coder scored were transferred at the end of each day's session from the MORE microprocessors to audiocassette tapes for storage. When each audiotape was filled to capacity, its data were loaded onto microcomputer diskettes. The data files were edited on a microcomputer and the data from the three passes were merged for each of the 2-minute video segments coded. The data were then transferred to the university's CDC CYBER computer. The data were aggregated by subject number and summary statistics on each child's data were computed in preparation for further analyses using standard statistical packages (SPSS and BMDP).

In order to maintain high interobserver agreement throughout the study, agreement on the coding of each segment was monitored. Final interobserver agreement was assessed across all 1152 segments using Pearson correlation coefficients. Pearson product-moment correlations (rather than Kappa, percentage agreement, etc.) were used to assess final interobserver agreement because total scores for each behavioral category (rather than discrete occurrences/nonoccurrences) were the unit of analysis in all subsequent statistical tests (Hartmann, 1977; Kent & Foster, 1977). The level of agreement was found to be above +.75 for most variables. Because averaged scores, rather than the raw data from

each coder, were used in all subsequent analyses, the interobserver correlations reported in Table 5 underestimate the actual reliability of the data as it was finally analyzed.

Preparation of Data for Statistical Analyses

Data from the first coded pass of the tape included the variables (1) group play, (2) dyadic play, (3) group proximity outside of play, (4) dyadic proximity outside of play, and (5) time spent alone. The distinction between same-sex peer(s), opposite-sex peer(s), and peers of both sexes was made for each of the first four variables. Each of the variables in the first pass was measured for duration. Within each two-minute sample, these durations were converted to percentages as follows:

Total Play--percentage of total time that was spent in group or dyadic play,

Group Play--percentage of total time spent playing with a group,

Dyadic Play--percentage of total time spent playing with a single peer,

Total Proximity--percentage of total time that was spent near peer(s) but did not involve play,

Group Proximity--percentage of total time spent proximal to a group,

Dyadic Proximity--percentage of total time spent proximal to a single peer, and

Alone--percentage of total time that was spent apart from peers and did not involve play.

These percentages were also subdivided according to the sex of the peers

involved. The data were also summed across play and proximity to yield measures of (1) total time spent with a single peer, (2) total time spent with a group, (3) total time spent with same-sex peers, and (4) total time spent with opposite-sex peers or in a mixed group.

Data from the contact categories in the second scored pass (target touch; peer touch; initiations and retaliations for all aggression categories: peer aggression directed toward the target, target slap, target punch, other forms of target aggression) were recorded as frequencies per minute. The following ratios were also examined: (1) frequency of slaps vs. total frequency of aggression by target, (2) frequency of punches vs. total frequency of target aggression, (3) frequency of aggression other than slaps and punches vs. total frequency of target aggression, (4) frequency of peer retaliations vs. frequency of aggression incited by the target subject, (5) frequency of target retaliations vs. frequency of aggression incited by peers, and (6) frequency of aggression incited by peers vs. frequency of aggression incited by the target child.

Data from the final pass consisted of high, medium, and low ratings on (1) the target's level of involvement with peers, (2) the target's attempts to elicit attention from peers, (3) peers' level of involvement with the target, and (4) the target's level of motor activity. Within each category, a summary score was derived by giving each recorded "high" a weight of 2, each "medium" a weight of 1, and each "low" a weight of 0. Ratings within each category were then multiplied by these weights, averaged, and divided by 2 to produce a total score ranging from 0 to 1. The following ratios were also calculated for each subject: (1) attention given to peers by the target vs. attention given

to target by peers, and (2) target efforts to elicit peer attention vs. attention given to the target by peers.

Results

Discriminant Function Analysis

One of the primary goals of the present study was to test the extent to which the PEI classification system used to identify the Aggressive, Withdrawn, Aggressive-withdrawn, and Contrast subjects actually selected children who differed behaviorally. A discriminant function analysis was used to examine this question by determining the extent to which the four groups of children could be differentiated using only the behavioral data to base their classification upon. Because many of the behavioral variables used in this study were conceptually intercorrelated (e.g., aggression and giving attention to peers) or were interdependent by virtue of the way they had been mathematically derived (e.g., the percentage of peer attacks to which a target subject retaliated was related to the total frequency of target aggression, since both variables took the frequency of target retaliations into account), it was not clear *a priori* which variables could be expected to contribute unique variance in differentiating between the four groups of children being studied. The selection of the subset of behaviors which, in combination, would best predict a child's group membership was therefore done empirically. Visual inspection of the group means for each of the 42 behavioral variables calculated led to the selection of 15 behavioral variables which appeared likely to discriminate among the four groups. The 15 variables were then included in a stepwise discriminant function reduction analysis, using the behavioral scores as predictor variables and group membership as the criterion (Table 6).

It was found that no significant improvement in the differentiation

among groups (as measured by at least marginal significance of changes in Rao's V) occurred after the seventh step of the analysis. Classification results were therefore examined using only the first seven variables as predictors. In descending order of their multivariate predictive power, the seven variables used were (1) target elicited attention, (2) total peer aggression, (3) total target aggression incited, (4) the ratio of target efforts to elicit attention vs. attention given to the target by peers, (5) group same-sex play, (6) the ratio of target-retaliated aggression to peer-incited aggression, and (7) the ratio of peer-retaliated aggression to target-incited aggression.

These seven variables yielded two discriminant functions which together accounted for 90% of the explained variance. A third, nonsignificant, function accounted for the remaining explained variance. The first function served primarily to separate the Aggressive from the Withdrawn children, leaving the Aggressive-withdrawn and Contrast children in an intermediate position. It accounted for 68% of the explained variance ($p < .01$). The second function was marginally significant and accounted for only 22% of the explained variance ($p < .10$). It focused on discriminating the Aggressive-withdrawn group from the Aggressive and Withdrawn groups. The canonical coefficients and discriminant functions are presented in Tables 7 and 8.

Figure 1 displays the four group centroids as plotted relative to the two main discriminant functions. The distinctiveness of the Withdrawn group's behavior is clearly indicated, as the centroid for that group is quite distant from the other three group centroids.

Using the seven variables above as predictors, the discriminant

function analysis was able to place 52.1% of the subjects in their correct peer-identified category (Table 9). This was more than twice the number which would be expected to be correctly placed by chance alone. The analysis was able to correctly classify 58.6% of Aggressive children, 55.6% of Withdrawn children, and 51.5% of Contrast children. Only 42.9% of Aggressive-withdrawn children were placed correctly. The poor rate of prediction for the Aggressive-withdrawn children was due to an inability to clearly differentiate them from Contrast children. It was found that 24.2% of the Contrast children were incorrectly identified as being Aggressive-withdrawn on the basis of their behavioral style. Conversely, 25.0% of Aggressive-withdrawn children were incorrectly identified as being in the Contrast group. The Aggressive-withdrawn and Contrast groups were the only pair of groups which the discriminant function could not significantly differentiate between (Table 10). This blurring of the distinction between Aggressive-withdrawn and Contrast children came as a surprise, since the Aggressive-withdrawn children had been expected to be the most deviant behaviorally and the least like Contrast children. The fact that the Aggressive-withdrawn children were selected on the basis of less extreme PEI scores than the Aggressive or Withdrawn groups might partially account for this finding. As reported in Table 2, the mean standard score for Aggressive-withdrawn children fell at the 94th and 95th percentiles on the PEI Aggression and Withdrawal scales, respectively, whereas the mean scores for the Aggressive and Withdrawn children fell within the 98th percentiles on their respective dimensions. These differences in PEI scores were not statistically significant, however, and it is therefore very intriguing that the Aggressive-withdrawn

children's behavior was so similar to that of the Contrast group.

In summary, except for difficulties in distinguishing Aggressive-withdrawn children from Contrast children, the discriminant function analysis showed that the group membership of individual subjects could be predicted quite effectively on the basis of their observed behavior.

Analyses of Variance Examining Group and Sex Differences in Behavior

Specific behavioral differences between the four peer-identified groups were examined using three-way (Group x Sex x School) analyses of variance (ANOVAs). School was included as a variable in the analyses in order to partial the variance due to school out of the error term. Differences between children at the two schools studied were not focused on, since differences in base rates across schools were tangential to the primary focus of this research.

In order to avoid redundant analyses, ANOVAs were conducted only on the most meaningful levels of a particular variable. For example, rather than analyze the variable same-sex group play independently, the data from that behavioral category were analyzed as part of the superordinate categories (1) total time spent in play, (2) total time spent with a group, and (3) total time spent with same-sex peers. In other cases, the lower level variables were more meaningful than the composite variables. The rate of aggression initiated by peers and the rate of aggression retaliated by peers, for example, were more meaningful when examined as two separate variables than when combined.

Tukey's honestly significant difference post hoc test, using the harmonic mean formula to deal with unequal cell sizes, were used to examine differences between pairs of groups following the finding of a significant group main effect. A .05 probability level was used for all

post hoc comparisons.

The means for each of the four groups are presented for each variable in Tables 11 to 14. The means for each sex are presented in Tables 15 to 22. Summary tables for the ANOVAs appear in Tables 23 to 40.

Differences in Duration Variables

Contrary to expectation, no significant group differences were found regarding the percentage of time spent in social play, $F(3,101) = 2.29$, n.s. All four groups spent between 48.6% and 60.1% of their recess period playing with one or more peers. Similarly, no significant group differences were found in the amount of time target children spent proximal to but not playing with peers, $F(3,101) = 0.95$, n.s. The four groups spent between 28.0% and 32.6% of their time near one or more peers but not engaged in play. Contrary to expectation, no significant sex differences were found in either amount of time spent in play, $F(1,101) = 0.20$, n.s., or in amount of time spent proximal to peers, $F(1,101) = 2.02$, n.s. The means were in the expected direction, however, with boys spending 57.5% of their time in play and 27.7% proximal to peers, whereas girls played with peers 55.2% of the time and were proximal to but not playing with peers 33.3% of the time.

A significant group effect was found in the amount of time spent alone, $F(3,101) = 5.12$, $p < .01$. Post hoc comparisons revealed that, as expected, the Withdrawn group spent significantly more time alone than did the other three groups. Withdrawn children spent 17.2% of their time alone, whereas the other groups spent between 9.5% and 11.1% of their time alone.

A significant group effect was found in the amount of time target children spent with a group of peers, as opposed to either alone or in a

dyad, $F(3,101) = 3.93$, $p < .01$. Tukey comparisons revealed that the Aggressive group spent significantly more time with a group than did Withdrawn children (76.2% versus 64.2%, respectively). Aggressive-withdrawn and Contrast children spent intermediate amounts of time with a group of peers, and did not differ from other groups on this variable. It had been hypothesized that boys would spend more time in a group than girls. However, there was no significant sex difference $F(1,101) = 1.15$, n.s., and the means actually showed that girls spent 73.1% of their time in a group whereas boys spent 70.5% of their time in a group. Similarly, no support was found for the hypothesis that the Aggressive-withdrawn group would be the only group in which boys would not spend more time in a group than girls. The Group x Sex interaction was nonsignificant, $F(3,101) = 0.59$, n.s.

It has been hypothesized that Aggressive-withdrawn children would spend more time in cross-sex interactions than other groups, and that boys would spend more time in such interactions than girls. These predictions received no support. The group effect was nonsignificant, $F(3,101) = 1.17$, n.s., as were the main effect of sex, $F(1,101) = 0.48$, n.s., and the Group x Sex interaction, $F(3,101) = 1.95$, n.s. At School 2, cross-sex play was very common while at School 1 it was relatively rare, $F(1,101) = 165.16$, $p < .001$. This was due to a policy at School 2 that assigned each classroom a section of the playground and thus encouraged children to play with boys and girls in their class on the one dodgeball court they had been assigned. At School 1, children generally spent time with same-sex peers from their own class and from other classrooms within the same grade. A significant Group x School interaction was found, $F(3,101) = 2.98$, $p < .05$, but it appeared to be

due to a floor effect in the scores at School 1 and thus to be of limited meaning.

Differences in Frequency Variables

A significant group main effect was found in the amount of nonaggressive touching that target children initiated, $F(3,101) = 9.56$, $p < .001$. The Aggressive children were found to initiate touches more frequently than any other group. The Aggressive group initiated 1.54 touches per minute, in comparison to the range of 0.90 to 1.17 touches per minute initiated by other groups. Boys initiated significantly more touches than girls (an average of 1.27 versus 1.10 per minute, respectively), $F(1,101) = 4.15$, $p < .05$.

The pattern of touches initiated by peers was somewhat different. Tukey tests following the significant group effect, $F(3,101) = 3.62$, $p < .05$, showed that the Aggressive group differed significantly only from the Withdrawn group. The Aggressive children received an average of 1.24 touches per minute, versus 0.89 for Withdrawn children. There were no sex or school differences.

Analyses of aggression data revealed a number of group and sex differences. The reader is reminded that the aggressive behavior referred to in this study includes a great deal of "play fighting" or "rough and tumble play", as well as aggression with serious intent to inflict injury. These two levels of aggression have been combined in this report, since intent to inflict injury could not be reliably differentiated from more playful sparring. Many of the aggressive interactions observed on the playground seemed to include both playful and truly violent elements.

As expected, a significant main effect of group was found in the

rate of aggression incited by target children, $F(1,101) = 5.52$, $p < .01$. Children in the Aggressive group incited aggression significantly more often than Withdrawn or Contrast children. Their rate of nearly one aggressive act per minute was double that of the Withdrawn subjects and more than 70% greater than that of the Contrast group. It was not significantly greater than the Aggressive-withdrawn group's rate of aggressive initiations. A significant sex difference was found. Boys initiated aggressive acts more than twice as frequently as girls, $F(1,101) = 26.37$, $p < .001$. The hypothesis that the sex difference would be especially prominent among Aggressive-withdrawn children was not supported. The Group x Sex interaction was not significant, $F(3,101) = 0.13$, n.s. It is interesting, however, that inspection of the means revealed that Aggressive and Aggressive-withdrawn boys initiated approximately twice as much aggression as did girls in the same groups. The sex difference was larger among Withdrawn children. Contrast children showed the largest difference. Contrast boys initiated more than three times as much aggression as Contrast girls.

The retaliatory aggression of target children was analyzed relative to the rate of aggression initiated by peers. A significant group main effect was found, $F(3,100) = 3.34$, $p < .05$. Aggressive children retaliated 40.6% of peer attacks whereas the other groups retaliated 26.4% to 27.9% of peer attacks. Tukey comparisons did not find this difference significant, however.

Differences in the type of aggressive behavior target children showed were also examined. As expected, a sex difference was found in the way target children manifested their aggression. However, the pattern of differences did not entirely conform to prediction. As

hypothesized, punches made up a larger percentage of boys' aggression (4.4%) than of girls' (0.6%), $F(1,96) = 19.08$, $p < .001$. Contrary to expectation, slaps also were more prevalent among boys. It was observed that 5.9% of boys' aggression took the form of slaps whereas only 3.6% of girls' aggression took that form, $F(1,96) = 4.40$, $p < .05$. It is important to emphasize that there were significant interactions involving each of these variables. In the case of the percentage of punches, a significant Group x Sex x School interaction was noted, $F(3,96) = 2.83$, $p < .05$, as well as a significant lower-order Sex x School interaction, $F(1,96) = 3.97$, $p < .05$. In the case of the percentage of slaps, a significant Sex x School interaction was found, $F(1,96) = 4.46$, $p < .05$. These interactions appeared to be due to the low frequency of slaps and punches overall. Some cells of the analyses contained zero frequencies, particularly for girls. The sex differences noted should therefore be regarded conservatively. Perhaps the best conclusion to draw from these analyses is that punching and slapping are not frequent modes of aggressive expression for either boys or girls.

The results regarding measures of peers' aggression are also somewhat difficult to interpret. A significant group effect was found in the ANOVA examining the rate of peer aggression initiated toward target subjects, $F(3,101) = 2.99$, $p < .05$. Examination of the group means showed that the Aggressive-withdrawn group received the most frequent attacks by peers whereas the Contrast group was aggressed upon least frequently. However, none of the groups differed significantly according to Tukey comparisons. Male target children received an average of 0.63 aggressive initiations per minute. Girls received an average of 0.33 initiations per minute. This sex difference was

significant, $F(1,101) = 21.29$, $p < .001$.

The percentage of target-initiated aggression which peers retaliated was also examined. The main effect of group was significant, $F(3,95) = 2.69$, $p < .05$. Group means ranged from 24.2% (Contrast group) to 36.1% (Aggressive-withdrawn group). However, none of the pairs of groups differed significantly according to Tukey comparisons. The presence of a significant Group x Sex interaction, $F(3,95) = 4.16$, $p < .01$, and a significant Group x Sex x School interaction, $F(3,95) = 2.75$, $p < .05$, further indicated that the main effect of group could not be meaningfully interpreted.

The ratio of peer-incited aggression to target-incited aggression was examined, and the groups were found to differ significantly, $F(3,95) = 4.95$, $p < .01$. The Aggressive-withdrawn group received almost twice as many aggressive initiations as they gave, whereas the Aggressive group initiated 50% more aggression than was initiated against them. Tukey comparisons found this difference to be significant. The Group x School interaction was also significant, $F(3,95) = 3.05$, $p < .05$, due to the fact that the groups differed more at School 1 than at School 2: At both schools, however, the Aggressive-withdrawn group received the largest ratio of peer-incited aggression to target-incited aggression, whereas the Aggressive group received the smallest ratio.

Differences in Behavioral Ratings

A significant group difference was found in the amount of attention target children gave to peers, $F(3,101) = 10.06$, $p < .001$. Withdrawn children were significantly less attentive to peers than were children in the other groups.

Withdrawn children also made significantly less effort to elicit

attention from peers, $F(3,101) = 19.93$, $p < .001$. There was also a significant School x Group interaction, $F(3,101) = 4.80$, $p < .01$. This was due to the fact that the Contrast group at School 1 was rated fairly low in efforts to elicit attention whereas the Contrast group at School 2 was rated very high. The interaction does not indicate that the main effect of group is not meaningful, since the Withdrawn children were rated lowest at both schools.

The Withdrawn group also was rated significantly lower than other groups regarding the amount of attention they received from peers, $F(3,101) = 5.33$, $p < .01$.

Significant group differences were observed in amount of physical activity (motor level), $F(3,101) = 3.57$, $p < .05$. Tukey comparisons showed the Withdrawn and Aggressive groups to be the two groups which differed significantly from each other, with the Aggressive children having been the most physically active and the Withdrawn group the least active. Boys were more active than girls, $F(1,101) = 16.27$, $p < .001$. The hypothesized Group x Sex interaction was not found, however, $F(3,101) = 1.49$, n.s. The sex difference was not especially large within the Aggressive-withdrawn group, nor were the Aggressive-withdrawn girls particularly inactive, as had been hypothesized.

Discussion

One major goal accomplished by this study was the behavioral validation of the PEI Aggression and Withdrawal scales. It was found that the children identified by the PEI as being very withdrawn do in fact behave in a way that merits the label "Withdrawn" and act very differently from children identified as being very aggressive as well as from children identified as being average in terms of their level of aggression and withdrawal. Similarly, those children identified by the PEI as being very aggressive were found to also show a very distinct behavioral pattern which merits the "Aggressive" label they received. Thus, the ability of the PEI to accurately select Aggressive and Withdrawn children was quite convincingly demonstrated. Less support was found for the procedure of identifying Aggressive-withdrawn children using the PEI. Behaviorally, Aggressive-withdrawn children could not be distinguished from Contrast children. Possible reasons for this are discussed below.

A second major purpose of this research was to assess the extent to which the literature on Controversial, Neglected, Rejected, and Average children provides behavioral descriptions which also apply to Aggressive, Withdrawn, Aggressive-withdrawn, and Contrast children. A striking degree of concordance between behavioral hypotheses generated on the basis of the sociometric-categorization literature and the behavior of the PEI-categorized children was found. The Aggressive children, similar to Controversial children (Dodge, 1983; Milich & Landau, 1984), frequently incited aggression. They were actively involved in play with peers and were very attentive toward peers, although not significantly more so than other groups. They spent

significantly more time with a group of peers than did Withdrawn children.

Like Neglected children (Asher et al., 1981; Coie & Kupersmidt, 1983; Milich & Landau, 1984), Withdrawn children spent much of their time alone and less than half of their time in play. They paid little attention to peers and rarely sought attention, as expected (Greenwood et al., 1977, 1979, 1982). They also received little attention from peers, as predicted (Dodge, 1983; Foster & Ritchey, 1981; Greenwood et al., 1979, 1982). Unlike Coie & Kupersmidt's (1983) reports regarding Neglected children, however, Withdrawn children in the present study were not particularly unlikely to retaliate once aggressed against.

The Contrast children, who had been selected on the basis of their near-average scores on the PEI, did not stand out on any of the behavioral variables. As expected based on the literature on sociometrically Average children (Coie & Kupersmidt, 1983; Ladd, 1983), they spent more than half of their time in play and they were quite aggressive. Contrary to Dodge's (1983) and Ladd's (1983) data, they did not receive especially high levels of attention from peers.

Aggressive-withdrawn children resembled descriptions of Rejected children in some ways, but not in most. Unlike reports regarding Rejected children (Asher et al., 1981; Coie & Kupersmidt, 1983; Dodge, 1983; Ladd, 1983; Putallaz, 1983), Aggressive-withdrawn children did not spend an unusually low amount of time in a group or in play, nor did they spend a large amount of time hovering proximal to peers (Asher et al., 1981; Gottman, 1977; Greenwood et al., 1977; Krappmann & Oswald, 1983; Ladd, 1983). They also did not spend an inordinate amount of time in cross-sex interactions, as "Ramblers" in Krappmann and Oswald's

(1983) study did. Also contrary to expectation (Coie & Kupersmidt, 1983; Dodge et al., 1984), they were found to retaliate nonsignificantly less aggression than other children. In contrast to reports by Dodge (1983), Krappmann and Oswald (1983), and Putallaz (1983) that Rejected children intrusively seek attention from peers, the Aggressive-withdrawn group in the present study did not stand out as attention-seekers. The appropriateness of the attention-getting strategies the Aggressive-withdrawn children did use was not assessed in the present study. In sum, the only way in which the Aggressive-withdrawn children conformed to descriptions of Rejected children (Coie & Kupersmidt, 1983; Dodge, 1983; Foster & Ritchey, 1981) was in the fact that they were frequently subjected to aversive behavior by peers. They were the victims of aggressive attacks almost twice as frequently as they were the perpetrators.

The findings regarding Aggressive-withdrawn children are of particular interest, since the Aggressive-withdrawn children are the group hypothesized to be at the highest risk for later psychopathology. A major purpose of this study was to identify target behaviors which a social skills training program might focus on in an attempt to avert some of the later problems Aggressive-withdrawn children are believed to be at risk for.

The finding that the behavior of Aggressive-withdrawn children did not differ from that of Contrast children, on one hand, might have been expected based on the fact that lower scores on the PEI scales were used as criteria for the Aggressive-withdrawn group. While Aggressive and Withdrawn subjects were selected from among those children scoring in the top 10% on the respective PEI scale, Aggressive-withdrawn subjects

were only required to score within the top 30% on each scale. This difference in scale criteria was unavoidable, since only 13 children (46% of the Aggressive-withdrawn group) were located who scored within the top 10% on both scales. A sufficient number of subjects for the Aggressive-withdrawn group could therefore only be obtained by using a relaxed criterion for this group. Given that the mean standard scores the Aggressive-withdrawn children received on the PEI placed them only three to four percentiles lower on both scales (94th percentile on Aggression, 95th percentile on Withdrawal) than the Aggressive and the Withdrawn groups (98th percentiles on their respective scales), however, it seems unlikely that the difference in selection criteria by itself could account for the failure to find deviance in the Aggressive-withdrawn children's behavior.

The failure to find anything particularly unusual about the Aggressive-withdrawn children's behavior appears to run contrary to the literature which holds that the Aggressive-withdrawn group is the most deviant of the four groups being studied. Research by Ledingham, Schwartzman, and their colleagues (as discussed above) has demonstrated quite convincingly that Aggressive-withdrawn children do indeed show more disturbance on a variety of nonbehavioral measures. In addition, research done using the same sample of target children studied in this report found that the Aggressive-withdrawn children in the present sample were less popular and had fewer reciprocal friends than did Contrast or Aggressive children (Feltham & Doyle, 1983), and that they were more likely to have been held back in school or placed in a remedial class at one-year follow-up (Lyons, Serbin, & Marchessault, 1984). Therefore, the failure to find specific ways in which the

Aggressive-withdrawn children act atypically would not seem to be due to an overall lack of maladjustment in our Aggressive-withdrawn sample.

Similar difficulties in detecting behavioral deviance have been encountered in observational work with Rejected children. Dodge et al. (1983) found that peers responded more aversively to Rejected children even when the behavior of the target children was held constant. They speculated that either their observational code was too crude to detect subtle differences in the Rejected children's behavior which were eliciting such responses from peers, or that nonbehavioral characteristics such as unattractiveness were responsible for the peers' negative treatment of the Rejected children. Asher (1983) has also suggested possible reasons why correlations between behavior and sociometric status have not been found to be higher. First, he pointed out that peers' perceptions of the intent underlying a target child's behavior have an important influence on how peers respond to the target child. Second, personal characteristics of the target child, such as school achievement or attractiveness level, may mediate peers' responses. Third, Asher suggested the possibility that more extensive samples of behavior need to be assessed.

The attractiveness of the Aggressive-withdrawn children in the present study, relative to that of children in the other three identified groups, was examined by Drouin (1984). He was not able to find any indication that the Aggressive-withdrawn children were perceived as less physically attractive than their peers.

Similarly, Asher's suggestion that more extensive data collection might reveal group differences was considered in terms of the data collected in the present study. It seems unlikely that more minutes of

playground observation per subject would change the results markedly. In the present study, the majority of the children observed (i.e., the 74 children at School 2) were observed on 12 or more separate days for an average total of approximately 28 minutes per subject. Fewer observations (an average of approximately 8 1/2 minutes of data collected on an average of three separate days) were collected per child for the 43 children at School 1. Stability analyses showed that 12 observations were sufficient to provide a clear representation of a child's behavioral style. Even three observations, as were collected at School 1, provided a fairly stable index of the children's behavior on the major categories analyzed.

Asher's (1983) suggestion may be more meaningful if interpreted to recommend increasing the variety of settings in which each child is observed, rather than increasing the number of observations within a given setting. Perhaps classroom observations, for example, would reveal additional facets of the Aggressive-withdrawn children's behavioral style that did not stand out clearly on the playground.

Dodge et al.'s speculation that a more sophisticated coding procedure might detect more group differences also seems to offer a fruitful area to focus on. In the present study, the most obvious coding limitation resulted from our inability to monitor the content of verbal interactions. It is conceivable, for example, that Aggressive-withdrawn children provoked peers verbally, but our study could not assess this possibility since the children's speech was not recorded.

Assessment of factors influencing peer perceptions of target children's intentions, as Asher (1983) has recommended, would require a significant shift in methodology. While it is possible to question

unacquainted peers as to perceived motives of target subjects following a laboratory play group, interviewing peers after each recess period at school would present a number of difficulties. First, it would necessitate revealing to some extent that a select group of children are being focused on and asked about. It might also raise peers' suspicions regarding the nature of target children's intentions, and thus involve serious ethical concerns. Finding time to question peers without interfering with their recess period or with later class time could present a serious logistical problem. Thus, it may not be particularly feasible to examine this question in a naturalistic playground setting.

The possibility that Aggressive-withdrawn children are less mature than their agemates has been suggested. Ledingham (1981) found that Aggressive-withdrawn children were characterized by their distractibility and need for adult contact--patterns that are more common among younger children.

In his observational study of Popular, Average, and Rejected children, Ladd (1983) found that the Rejected children frequently associated with playmates younger than themselves. In the present study, it was not possible to examine whether Ladd's finding regarding Rejected children might generalize to Aggressive-withdrawn children. The two schools in which the present study was conducted had a policy of encouraging children of each grade level to play in separate areas of the schoolyard. One of the two schools had painted separate court outlines on the playground pavement to denote where children from each classroom should play. Thus, there was no opportunity to observe whether Aggressive-withdrawn children would, if given the freedom to, gravitate toward younger children rather than agemates.

It was also impossible in the present study (due to the School x Age confound encountered) to examine the possibility that Aggressive-withdrawn children might behave more like Contrast children a few years younger than themselves than like peers their own age. A detailed cross-sectional study comparing Aggressive-withdrawn children's behavior to norms for different age levels might shed light on what is distinctive about the Aggressive-withdrawn children and what triggers negative peer reactions toward them.

The finding that Aggressive-withdrawn children's behavioral interactions during free play differ from those of Contrast children only in terms of the relative frequency of peer aggression they are subjected to has important implications for intervention strategies. As Asarnow (1983) concluded after observing the interactions of positively-perceived and of negatively-perceived children, it suggests that intervention--rather than focusing solely on the Aggressive-withdrawn children's behavior per se--should also focus on changing peer subsystems and reputational factors. Asarnow suggests the development of a social-systems-oriented program that would include efforts to change the way in which unpopular children are perceived and responded to by peers.

While such a focus could certainly be advocated based on the results of the present study, such a strategy seems unlikely to provide a total solution to the problems of Rejected or Aggressive-withdrawn children. Kupersmidt's (1983) finding that Rejected children's sociometric status does not change even when they are introduced to a new group of peers, and Dodge et al.'s (1983) report that Rejected children are less well received by unacquainted peers even when their

entry behavior is similar to that of Popular children strongly suggest that there is some characteristic of Rejected children that elicits aversive responses from peers. Unless that characteristic (or constellation of characteristics) is dealt with, it would seem unlikely that the Rejected child's difficulties would be ameliorated. The same would appear to hold true for Aggressive-withdrawn children, since their PEI scores continue to reflect deviance year after year, even though the children are frequently being rated by different sets of classmates each year (Moskowitz, Schwartzman, & Ledingham, in press).

Whether "Aggressive-withdrawn" is an appropriate title for the group of children so-labeled should be seriously questioned. The present behavioral data show no indication that these children are more aggressive or more withdrawn than Contrast subjects. Why peers nominate these children frequently for items on the Aggression and Withdrawal scales of the PEI remains unclear. It is quite possible, however, that rather than reflecting any true withdrawn or aggressive tendencies, such nominations are the product of a halo effect. The fact that "Aggressive-withdrawn" children are very unpopular may lead peers to nominate them in response to any questionnaire item that carries a negative connotation. Thus, it may be misleading for researchers to persist in referring to these children as "Aggressive-withdrawn".

The group of children whose behavior was most atypical on the playground was the Withdrawn group, rather than the Aggressive or Aggressive-withdrawn children. The discriminant function analysis showed this particularly clearly, as few Withdrawn children were incorrectly categorized as Contrast children, and vice versa. The Withdrawn group's centroid, plotted in Figure 1, was positioned quite

apart from the other three group centroids, indicating that the Withdrawn group's behavior pattern was very distinctive.

Greenwood et al. (1977) asserted that teachers are not motivated to identify and refer Withdrawn children who may need social skills training. It may be that the low referral rates for Withdrawn children are due not to lapses in teachers' concern or motivation so much as to situational factors. Whereas aggressive and disruptive behavior may be obviously out of place within the structure of the classroom, withdrawn behavior may not only be less troublesome within the classroom setting but also closer to the behavioral norm for that setting. It is not, however, typical playground behavior. Rather, the present study found group play, attentiveness to and from peers, and frequent aggression/play fighting to be the norm on the playground. Thus, playground observation may be a very effective strategy for the identification of children who are seriously withdrawn.

Such identification of Withdrawn children may be quite important in light of Hymel and Rubin's (in press) recent review of the literature on sociometric measures and peer assessments as indices of risk. They concluded that Neglected and Withdrawn children are not particularly at risk for externalizing problems such as delinquency and conduct disorders, but hypothesize that such children may be at risk for internalizing problems such as social anxiety, low esteem, low self-efficacy, and depression. Further research is needed to test Hymel and Rubin's hypothesis.

Some interesting sex differences were found across groups in the present study. Boys showed more physical aggression than girls and were more physically active, as was expected based on the literature (Block,

1976; Eme, 1979; Hartup, 1974; Maccoby & Jacklin, 1980; Williams et al., 1983). However, girls did not spend significantly more time with peers outside of the context of a game than boys did, contrary to Ladd's (1983) findings. Also, contrary to expectation, boys neither spent more time than girls in a group of peers, nor did they spend significantly more time in play (cf. Ladd, 1983; Maccoby, in press). This failure to detect differences in play and group interactions may be a function of the situation in which the present data were collected. It was the norm for both sexes to spend much of their recess time in group games. This behavior was encouraged by the teachers monitoring the playground and by the type and limited quantity of play equipment the school provided. Under less structured conditions with more options available to them, boys and girls may spend their time differently.

Predictions regarding sex differences within the four groups were not supported. One unexpected finding was the fact that the sex difference in aggression incited by target children was nearly twice as prominent among Contrast subjects as among Aggressive children. Although statistically nonsignificant, this finding is of interest because it appears to contradict Maccoby and Jacklin's (1980) speculation that sex differences in aggression are probably due to the existence of more extremely aggressive boys than extremely aggressive girls. Maccoby and Jacklin suggested that the typical boy is not necessarily more aggressive than the typical girl. However, the present results suggest that the sex difference may be greater among the "typical" Contrast subjects than within the group identified as being extremely aggressive. Maccoby and Jacklin acknowledged that this issue has yet to be fully explored experimentally. It appears to be an area that merits further research.

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Appendix A

Pupil Evaluation Inventory

(French Form)

VOTRE NOM: _____

VOTRE NUMERO: _____

						$	1				.1 (1-11)	

	LES AUTRES				MOI	
1. Ceux qui agissent plus jeunes que leur âge.						2 (8-17)
2. Ceux qui aident les autres.						2 (18-27)
3. Ceux qui ne sont pas capables de rester assis tranquilles.						2 (28-37)
4. Ceux qui essaient de mettre les autres dans le trouble.						2 (38-47)
5. Ceux qui sont trop timides pour se faire des amis facilement.						2 (48-57)
6. Ceux qui se sentent trop facilement blessés.						2 (58-67)
7. Ceux qui prennent des airs supérieurs et qui pensent qu'ils valent mieux que tout le monde.						2 (68-77)

	LES AUTRES				MOI	
8. Ceux qui font les clowns et font rire les autres.						3 (8-17)
9. Ceux qui commencent la chicane à propos de rien.						3 (18-27)
10. Ceux qui ne semblent jamais s'amuser						3 (28-37)
11. Ceux qui sont bouleversés quand ils ont à répondre aux questions en classe.						3 (38-47)
12. Ceux qui disent aux autres enfants quoi faire.						3 (48-57)
13. Ceux qui sont d'habitude les derniers choisis pour participer à des activités de groupe.						3 (58-67)
14. Ceux que tout le monde aime.						3 (68-77)

	LES AUTRES				MOI	
15. Ceux qui s'empêtrent tout le temps et se mettent en difficultés.						4 (8-17)
16. Ceux qui rient des gens.						4 (18-27)
17. Ceux qui ont très peu d'amis.						4 (28-37)
18. Ceux qui font des choses bizarres.						4 (38-47)
19. Ceux qui sont vos meilleurs amis.						4 (48-57)
20. Ceux qui ennuient les gens qui essaient de travailler.						4 (58-67)
21. Ceux qui se mettent en colère quand ça ne marche pas comme ils veulent.						4 (68-77)

	LES AUTRES				MOI	
22. Ceux qui ne portent pas attention au professeur.						5 (8-17)
23. Ceux qui sont impolis avec le professeur.						5 (18-27)
24. Ceux qui sont malheureux ou tristes.						5 (28-37)
25. Ceux qui sont particulièrement gentils.						5 (38-47)
26. Ceux qui se comportent comme des bébés.						5 (48-57)
27. Ceux qui sont méchants et cruels avec les autres enfants.						5 (58-67)
28. Ceux qui souvent ne veulent pas jouer.						5 (68-77)

	LES AUTRES				MOI	
29. Ceux qui vous regardent de travers.						6 (8-17)
30. Ceux qui veulent faire les fins devant la classe.						6 (18-27)
31. Ceux qui disent qu'ils peuvent battre tout le monde.						6 (28-37)
32. Ceux qué l'on ne remarque beaucoup.						6 (38-47)
33. Ceux qui exagèrent et racontent des histoires.						6 (48-57)
34. Ceux qui se plaignent toujours et qui ne sont jamais contents.						6 (58-67)
35. Ceux qui semblent toujours comprendre ce qui se passe.						6 (68-77)

Appendix B

Pupil Evaluation Inventory

(English Translation of Items)

Pupil Evaluation Inventory

(English Translation of Items)

1. (Example question).
2. Those who help others.
3. Those who can't sit still.
4. Those who try to get other people into trouble.
5. Those who are too shy to make friends easily.
6. Those whose feelings are too easily hurt.
7. Those who act stuck-up and think they are better than everyone else.
8. Those who play the clown and get others to laugh.
9. Those who start a fight over nothing.
10. Those who never seem to be having a good time.
11. Those who are upset when called on to answer questions in class.
12. Those who tell other children what to do.

The Pupil Evaluation Inventory
(English Translation of Items)

13. Those who are usually chosen last to join in group activities.

14. Those who are liked by everyone.

15. Those who always mess around and get into trouble.

16. Those who make fun of people.

17. Those who have very few friends.

18. Those who do strange things.

19. Those who are your best friends.

20. Those who bother people when they're trying to work.

21. Those who get mad when they don't get their way.

22. Those who don't pay attention to the teacher.

23. Those who are rude to the teacher.

24. Those who are unhappy or sad.

The Pupil Evaluation Inventory
(English Translation of Items)

25. Those who are especially nice.

26. Those who act like a baby.

27. Those who are mean and cruel to other children.

28. Those who often don't want to play.

29. Those who give dirty looks.

30. Those who want to show off in front of the class.

31. Those who say they can beat everybody up.

32. Those who aren't noticed much.

33. Those who exaggerate and make up stories.

34. Those who complain nothing seems to make them happy.

35. Those who always seem to understand things.

Appendix C

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 D

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
CiC1		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	37- group same sex
28- peer opposite sex	38- group opposite sex
2- peer indeterminate sex	378- group both sexes
	3- group indeterminate sex

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

127- peer same sex	137- group same sex
128- peer opposite sex	138- group opposite sex
12- peer indeterminate 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 E

Statistical Tables

Table 1

Distribution of Target Subjects

	School 1	School 2	Total
	1981-1982	1982-1983	
Size of population sampled	174	282	456
Number of target subjects selected	43	74	117

	Target breakdown by group			
	A	W	AW	C
Boys				
School 1				
Grade 5	3	3	2	3
Grade 6	3	3	2	3
School 2				
Grade 4	4	4	6	5
Grade 5	6	5	4	5
Girls				
School 1				
Grade 5	2	1	3	3
Grade 6	4	4	1	3
School 2				
Grade 4	5	3	5	5
Grade 5	2	4	5	6
Total	29	27	28	33

Table 2

Average PEI Aggression and Withdrawal Z Scores (and Standard Deviations) for Each Group

Group	Sex					
	Both sexes		Males		Females	
	Z	Percentile	Z	Percentile	Z	Percentile
Aggression Scale						
A	1.94 (0.46)	98	1.75 (0.36)	96	2.18 (0.48)	99
W	-0.69 (0.56)	25	-0.84 (0.50)	20	-0.51 (0.60)	30
AW	1.53 (0.63)	94	1.27 (0.53)	90	1.80 (0.62)	96
C	-0.37 (0.51)	36	-0.40 (0.23)	34	-0.34 (0.68)	37
Withdrawal Scale						
A	-0.17 (0.47)	43	-0.11 (0.44)	46	-0.25 (0.51)	40
W	1.99 (0.56)	98	2.15 (0.55)	99	1.78 (0.52)	97
AW	1.59 (0.60)	95	1.42 (0.64)	93	1.76 (0.51)	97
C	-0.21 (0.32)	42	-0.27 (0.27)	40	-0.14 (0.35)	45

Note. There were no significant differences between the scores of boys and those of girls within any of the four groups.

Table 3

Average PEI Likability Scores

(and Standard Deviations) for Each Group

Group	Sex					
	Both sexes		Males		Females	
	Z	Percentile	Z	Percentile	Z	Percentile
A	-0.25 (0.60)	40	-0.09 (0.65)	46	-0.44 (0.50)	33
W	-0.28 (0.81)	39	-0.26 (0.77)	40	-0.32 (0.81)	38
AW	-0.85 (0.68)	20	-1.08 (0.39)	16	-0.61 (0.82)	27
C	0.21 (1.11)	59	0.15 (1.16)	56	0.26 (1.10)	61

Table 4

Alpha Coefficients Measuring

Stability of Behavior Across Segments

	School 1	School 2	
Variable	3 segments	3 segments	12 segments
Play	.55	.34	.65
Same-sex group	.59	.50	.74
Opposite-sex group	-.03	.80	.67
Mixed-sex group	-.03	.48	.71
Same-sex peer	.08	-.04	-.07
Opposite-sex peer	.75	-.08	.11
Proximity	.47	.51	.73
Same-sex group	.11	.35	.59
Opposite-sex group	.80	.03	.48
Mixed-sex group	.20	.00	.64
Same-sex peer	-.06	.24	.50
Opposite-sex peer	-.33	.01	.31
Alone	.31	.31	.60
With a group	.31	.20	.54
With one peer	.41	.00	.47
With same-sex peers	.36	.52	.74
With opposite-sex peers (including time in a mixed-sex group)	.60	.53	.74
Touch	.36	.59	.73
Target	.36	.49	.66
Peer	.17	.45	.72
Aggression	.50	.46	.73
Target total	.35	.45	.75
Incited	.35	.48	.77
Retaliated	.42	.13	.50
Punch	.13	.83	.56
Slap	.13	.01	.39
"Other"	.42	.42	.73
Peer total	.54	.43	.67
Incited	.46	.51	.63
Retaliated	.42	.12	.60
Attention target gave	.44	.21	.66
Attention target elicited	.49	.37	.71
Attention peers gave	.54	.22	.66
Motor level	.51	.52	.72

Table 5

Pearson Product-moment Correlation Coefficients Measuring Interobserver Agreement

Duration variables:

Play	.81
Group	.84
Same sex	.70
Opposite sex	.42
Mixed	.70
Dyad	.75
Same sex	.77
Opposite sex	.61
Proximity	.85
Group	.82
Same sex	.78
Opposite sex	.28
Mixed	.14
Dyad	.77
Same sex	.78
Opposite sex	.67
Alone	.82
With same sex (in play or proximity)	.50
With opposite sex (in play or proximity)	.52

Frequency variables:

Touch	.46
Target	.59
Peer	.63
Aggression	.87
Target total	.82
Incited	.76
Retaliated	.83
Punch	.48
Slap	.43
"Other"	.82
Peer total	.87
Incited	.82
Retaliated	.76

Rated variables:

Attention	
Target gave	.73
Target elicited	.72
Peer gave	.71
Motor level	.75

Table 6

Discriminant Function Analysis

Step Entered	Wilks Lambda	Rao's V	Significance of Change in V
1 Target elicited attention	0.708	46.6	0.000
2 Total peer aggression	0.654	58.1	0.010
3 Total aggression incited by target	0.582	72.5	0.002
4 Target elicited attention/peers gave attention	0.552	80.8	0.039
5 Play with same-sex group	0.512	91.1	0.017
6 Target-retaliated/peer-incited aggression	0.497	95.5	0.215
7 Peer-retaliated/target-incited aggression	0.474	102.1	0.089
8 Target touch	0.465	105.1	0.391
9 Peers gave attention	0.455	108.0	0.410
10 Time with opposite- or mixed-sex group	0.443	111.2	0.356
11 Peer-incited/target-incited aggression	0.438	112.9	0.624
12 Motor level	0.435	114.5	0.677
13 Target gave attention/peers gave attention	0.431	116.0	0.680
14 Target gave attention	0.425	118.1	0.552
15 Time alone	0.423	118.9	0.850

Table 7

Standardized Canonical Discriminant Function Coefficients

	Function		
	1	2	3
Target elicited attention	0.79	-0.56	0.41
Total peer aggression	-0.51	-0.48	0.08
Total aggression incited by target	0.11	0.82	0.28
Target elicited attention/ peers gave attention	-0.49	0.14	0.64
Play with same-sex group	0.31	0.02	-0.80
Target-retaliated/peer-incited aggression	0.29	0.76	0.05
Peer-retaliated/target-incited aggression	-0.19	-0.67	0.16

Table 8

Canonical Discriminant Functions
Evaluated at the Group Centroids

Function	Group			
	A	W	AW	C
1	0.85	-1.29	0.00	0.31
2	0.49	0.31	-0.67	-0.12
3	0.22	0.03	0.27	-0.45

Table 9

Discriminant Function Classification Results

Actual group	n	Predicted group membership			
		A	W	AW	C
A	29	n=17 58.6%	n=1 3.4%	n=3 10.3%	n=8 27.6%
W	27	n=1 3.7%	n=15 55.6%	n=6 22.2%	n=5 18.5%
AW	28	n=6 21.4%	n=3 10.7%	n=12 42.9%	n=7 25.0%
C	33	n=5 15.2%	n=3 9.1%	n=8 24.2%	n=17 51.5%

Note. The inequality of group sizes was statistically taken into account when predicting group membership.

Table 10

F Ratios Between Pairs of Groups in the Discriminant Function Analysis

Group	Group A	Group W	Group AW
W	10.11**		
AW	3.67**	5.71**	
C	2.53*	7.03**	1.86

Note. Each ratio has 6 and 108 degrees of freedom.

* $p<.05$

** $p<.01$

Table 11

Means (and Standard Deviations) of Duration Variables

	Group			
	A	W	AW	C
Play	60.1 (23.5)	48.6 (26.1)	55.8 (15.7)	60.0 (17.1)
with same-sex group	30.0 (29.3)	23.0 (24.2)	23.4 (17.1)	35.4 (21.6)
with opposite-sex group	1.2 (2.2)	1.3 (2.5)	1.4 (2.1)	2.6 (6.9)
with mixed-sex group	25.8 (25.1)	20.9 (24.3)	27.2 (21.7)	18.7 (17.4)
with same-sex peer	2.7 (3.0)	3.1 (4.0)	2.8 (3.0)	2.9 (3.2)
with opposite-sex peer	0.5 (1.3)	0.3 (0.6)	1.0 (2.5)	0.4 (1.1)
Proximal (but not playing)	29.0 (21.0)	32.6 (22.3)	32.4 (15.1)	28.0 (15.5)
to same-sex group	14.5 (14.2)	14.7 (13.4)	14.7 (11.4)	12.8 (10.3)
to opposite-sex group	1.7 (2.8)	1.6 (2.2)	2.3 (3.9)	1.4 (2.2)
to mixed-sex group	3.1 (4.1)	2.7 (3.9)	3.7 (4.2)	2.4 (3.6)
to same-sex peer	8.6 (8.3)	11.5 (9.6)	10.0 (6.0)	10.0 (7.8)
to opposite-sex peer	1.2 (1.7)	2.1 (3.8)	1.7 (2.1)	1.5 (2.1)
Alone	9.5 (5.2)	17.2 (11.2)	11.1 (5.8)	10.7 (7.4)

(Table 11, continued)

Total time with a group (across play and proximity)	76.2 (13.7)	64.2 (19.2)	72.7 (10.9)	73.3 (14.1)
Total time with a single peer (across play and proximity)	13.0 (9.9)	17.0 (11.3)	15.5 (8.0)	14.8 (10.1)
Total time with opposite-sex peers (including time with a mixed-sex group)	33.5 (29.4)	28.9 (24.7)	37.2 (24.2)	26.9 (20.8)
Total time with same-sex peers	55.7 (31.3)	52.3 (24.4)	51.0 (23.8)	61.1 (22.0)

Note. Means represent percentage of time spent in each activity.

Table 12

Means (and Standard Deviations) for Frequency Variables

	Group			
	A	W	AW	C
Total nonaggressive touch	2.776 (0.995)	1.783 (0.731)	2.302 (0.621)	2.167 (0.796)
total by target	1.540 (0.577)	0.897 (0.468)	1.168 (0.402)	1.149 (0.446)
total by peer	1.235 (0.503)	0.886 (0.378)	1.134 (0.360)	1.018 (0.426)
Total aggression	1.710 (0.935)	1.198 (1.150)	1.540 (1.202)	1.160 (1.190)
total by target	1.043 (0.651)	0.572 (0.571)	0.739 (0.593)	0.619 (0.684)
incited	0.856 (0.566)	0.431 (0.411)	0.561 (0.437)	0.493 (0.541)
retaliated	0.187 (0.138)	0.141 (0.177)	0.178 (0.212)	0.126 (0.173)
punches	0.044 (0.068)	0.024 (0.050)	0.018 (0.035)	0.027 (0.086)
slaps	0.085 (0.220)	0.033 (0.073)	0.036 (0.070)	0.019 (0.029)
"other" (non-slap, non-punch)	0.914 (0.520)	0.516 (0.521)	0.685 (0.535)	0.573 (0.644)
total by peer	0.667 (0.341)	0.626 (0.632)	0.801 (0.667)	0.541 (0.533)
incited	0.449 (0.224)	0.486 (0.501)	0.607 (0.478)	0.415 (0.378)
retaliated	0.218 (0.156)	0.140 (0.196)	0.193 (0.215)	0.127 (0.181)

Note. Means represent frequencies per minute.

Table 13

Means (and Standard Deviations) of Aggression Ratios

	Group			
	A	W	AW	C
Target punch/all target aggression	0.032 (0.044)	0.026[b] (0.045)	0.020[a] (0.042)	0.026[b] (0.086)
Target slap/all target aggression	0.060 (0.096)	0.048[b] (0.083)	0.042[a] (0.091)	0.042[b] (0.082)
Target "other"/all target aggression	0.908 (0.102)	0.926[b] (0.117)	0.938[a] (0.128)	0.931[b] (0.111)
Peer retaliated/ target incited	0.245[a] (0.139)	0.297[b] (0.248)	0.361[a] (0.270)	0.242[b] (0.220)
Target retaliated/ peer incited	0.406 (0.249)	0.273[a] (0.232)	0.279 (0.196)	0.264 (0.224)
Peer incited/ target incited	0.669[a] (0.548)	1.409[b] (1.528)	1.869[a] (2.556)	1.347[b] (1.804)

Note. Means represent frequency of first variable per minute divided by frequency of second variable per minute.

[a]Ratio could not be calculated for one subject due to a zero denominator.

[b]Ratio could not be calculated for two subjects due to a zero denominator.

Table 14

Means (and Standard Deviations) of Ratings and Rating Ratios

	Group			
	A	W	AW	C
Target gave attention to peers	0.877 (0.082)	0.734 (0.185)	0.849 (0.068)	0.843 (0.108)
Target elicited attention from peers	0.700 (0.073)	0.517 (0.152)	0.664 (0.085)	0.638 (0.100)
Peers gave attention to target	0.383 (0.109)	0.254 (0.141)	0.359 (0.143)	0.354 (0.133)
Target gave attention/peers gave attention	2.482 (0.860)	5.807 (7.511)	2.826 (1.452)	2.708 (1.048)
Target elicited attention/peers gave attention	1.945 (0.560)	3.636 (4.135)	2.139 (0.936)	1.988 (0.591)
Target's physical activity (motor level)	0.476 (0.105)	0.408 (0.112)	0.463 (0.093)	0.438 (0.083)

Note. All ratings were on a scale of 0 to 1.

Table 15

Means (and Standard Deviations) of Duration Variables for Boys

	Group			
	A	W	AW	C
Play	58.0 (22.4)	49.8 (24.2)	59.1 (17.3)	62.6 (21.3)
with same-sex group	29.8 (24.4)	23.8 (25.1)	25.5 (19.5)	32.5 (25.0)
with opposite-sex group	0.8 (1.2)	1.3 (2.4)	1.5 (2.3)	5.1 (9.4)
with mixed-sex group	24.4 (22.6)	21.1 (25.1)	27.8 (22.4)	21.7 (17.8)
with same-sex peer	2.7 (3.3)	3.2 (3.6)	2.8 (1.8)	2.6 (2.8)
with opposite-sex peer	0.3 (0.4)	0.3 (0.8)	1.6 (3.5)	0.7 (1.6)
Proximal (but not playing)	29.4 (21.4)	29.2 (20.9)	29.4 (17.1)	23.1 (17.5)
to same-sex group	14.5 (13.4)	11.7 (12.2)	12.4 (10.7)	9.4 (7.9)
to opposite-sex group	1.3 (1.5)	1.7 (2.3)	3.1 (5.2)	1.2 (1.4)
to mixed-sex group	2.6 (3.7)	2.7 (3.5)	4.1 (5.6)	1.9 (2.9)
to same-sex peer	9.9 (9.5)	10.5 (9.0)	8.0 (6.0)	9.0 (8.6)
to opposite-sex peer	1.0 (1.5)	2.6 (4.5)	1.7 (2.2)	1.5 (2.3)
Alone	10.6 (4.7)	18.3 (11.5)	10.4 (4.5)	13.1 (8.9)

(Table 15, continued)

Total time with a group (across play and proximity)	73.5 (14.0)	62.3 (17.9)	74.5 (11.7)	71.8 (15.3)
Total time with a single peer (across play and proximity)	14.0 (11.3)	16.7 (11.3)	14.1 (9.1)	13.9 (10.6)
Total time with opposite-sex peers (including time with a mixed-sex group)	30.5 (24.6)	29.8 (26.8)	39.8 (24.5)	32.1 (21.7)
Total time with same-sex peers	57.0 (26.8)	49.2 (26.7)	48.7 (23.4)	53.6 (21.7)

Note. Means represent percentage of time spent in each activity.

Table 16

Means (and Standard Deviations) of Duration Variables for Girls

	Group			
	A	W	AW	C
Play	62.7 (25.4)	47.1 (29.4)	52.5 (13.6)	57.6 (12.0)
with same-sex group	30.1 (35.5)	22.0 (24.1)	21.4 (14.8)	38.2 (18.3)
with opposite-sex group	1.8 (3.1)	1.3 (2.6)	1.3 (1.9)	0.2 (0.5)
with mixed-sex group	27.4 (28.7)	20.6 (24.4)	26.5 (21.7)	15.8 (17.1)
with same-sex peer	2.7 (2.8)	3.0 (4.7)	2.8 (3.9)	3.2 (3.6)
with opposite-sex peer	0.8 (1.9)	0.2 (0.3)	0.5 (0.7)	0.1 (0.2)
Proximal (but not playing)	28.5 (21.3)	36.9 (24.2)	35.4 (12.6)	32.7 (12.1)
to same-sex group	14.4 (15.8)	18.6 (14.4)	17.0 (12.0)	16.0 (11.5)
to opposite-sex group	2.2 (3.8)	1.6 (2.2)	1.5 (1.9)	1.6 (2.8)
to mixed-sex group	3.6 (4.6)	2.6 (4.5)	3.2 (2.1)	2.9 (4.2)
to same-sex peer	6.9 (6.4)	12.7 (10.4)	12.1 (5.4)	10.8 (7.2)
to opposite-sex peer	1.4 (1.9)	1.5 (2.5)	1.6 (2.1)	1.4 (1.9)
Alone	8.1 (5.6)	15.7 (11.2)	11.8 (7.0)	8.5 (5.0)

(Table 16, continued)

Total time with a group (across play and proximity)	79.5 (13.0)	66.7 (21.4)	70.9 (10.3)	74.7 (13.2)
Total time with a single peer (across play and proximity)	11.7 (8.0)	17.4 (11.8)	17.0 (6.7)	15.6 (9.9)
Total time with opposite-sex peers (including time with a mixed-sex group)	37.1 (35.1)	27.8 (23.0)	34.6 (24.5)	22.1 (19.3)
Total time with same-sex peers	54.1 (37.2)	56.2 (21.7)	53.3 (24.8)	68.2 (20.5)

Note. Means represent percentage of time spent in each activity.

Table 17

Means (and Standard Deviations) for Frequency Variables for Boys

	Group			
	A	W	AW	C
Total nonaggressive touch	2.974 (1.181)	1.894 (0.792)	2.470 (0.636)	2.199 (0.786)
total by target	1.631 (0.665)	1.057 (0.459)	1.245 (0.401)	1.141 (0.454)
total by peer	1.342 (0.617)	0.837 (0.380)	1.225 (0.380)	1.058 (0.442)
Total aggression	2.004 (1.032)	1.611 (1.299)	2.134 (1.296)	1.785 (1.422)
total by target	1.262 (0.730)	0.804 (0.654)	1.006 (0.643)	0.984 (0.824)
incited	1.058 (0.640)	0.600 (0.465)	0.752 (0.457)	0.765 (0.665)
retaliated	0.204 (0.121)	0.204 (0.211)	0.254 (0.260)	0.219 (0.209)
punches	0.068 (0.079)	0.041 (0.062)	0.035 (0.043)	0.056 (0.118)
slaps	0.127 (0.293)	0.052 (0.094)	0.062 (0.092)	0.024 (0.031)
"other" (non-slap, non-punch)	1.068 (0.560)	0.712 (0.608)	0.909 (0.574)	0.905 (0.786)
total by peer	0.742 (0.358)	0.807 (0.675)	1.128 (0.739)	0.800 (0.634)
incited	0.508 (0.240)	0.602 (0.484)	0.852 (0.518)	0.577 (0.446)
retaliated	0.234 (0.156)	0.206 (0.242)	0.276 (0.257)	0.224 (0.218)

Note. Means represent frequencies per minute.

Table 18

Means (and Standard Deviations) for Frequency Variables for Girls

	Group			
	A	W	AW	C
Total nonaggressive touch	2.532 (0.669)	1.644 (0.654)	2.135 (0.579)	2.136 (0.829)
total by target	1.428 (0.446)	0.696 (0.413)	1.091 (0.402)	1.156 (0.453)
total by peer	1.104 (0.282)	0.948 (0.382)	1.044 (0.328)	0.980 (0.420)
Total aggression	1.348 (0.673)	0.682 (0.676)	0.945 (0.751)	0.572 (0.422)
total by target	0.773 (0.425)	0.283 (0.246)	0.472 (0.404)	0.275 (0.196)
incited	0.606 (0.339)	0.220 (0.187)	0.369 (0.330)	0.237 (0.164)
retaliated	0.167 (0.158)	0.063 (0.074)	0.102 (0.114)	0.038 (0.044)
punches	0.014 (0.033)	0.002 (0.005)	0.001 (0.004)	0.001 (0.003)
slaps	0.034 (0.036)	0.010 (0.020)	0.010 (0.018)	0.014 (0.027)
"other" (non-slap, non-punch)	0.725 (0.411)	0.271 (0.320)	0.461 (0.397)	0.260 (0.193)
total by peer	0.575 (0.307)	0.399 (0.512)	0.474 (0.384)	0.298 (0.246)
incited	0.376 (0.186)	0.340 (0.504)	0.363 (0.276)	0.262 (0.220)
retaliated	0.198 (0.160)	0.059 (0.056)	0.111 (0.126)	0.036 (0.050)

Note. Means represent frequencies per minute.

Table 19

Means (and Standard Deviations) of Aggression Ratios for Boys

	Group			
	A	W	AW	C
Target punch/all target aggression	0.043 (0.042)	0.041 (0.053)	0.035 (0.043)	0.056 (0.118)
Target slap/all target aggression	0.071 (0.118)	0.065 (0.100)	0.062 (0.092)	0.024 (0.031)
Target "other"/all target aggression	0.886 (0.120)	0.894 (0.138)	0.909 (0.574)	0.905 (0.786)
Peer retaliated/ target incited	0.203 (0.083)	0.291 (0.225)	0.331 (0.217)	0.351[a] (0.240)
Target retaliated/ peer incited	0.398 (0.159)	0.295 (0.196)	0.278 (0.162)	0.365 (0.264)
Peer incited/ target incited	0.673 (0.607)	1.381 (1.036)	2.012 (2.699)	1.462[a] (2.443)

Note. Means represent frequency of first variable per minute divided by frequency of second variable per minute.

[a]Ratio could not be calculated for one subject due to a zero denominator.

Table 20

Means (and Standard Deviations) of Aggression Ratios for Girls

	Group			
	A	W	AW	C
Target punch/all target aggression	0.014 (0.033)	0.002[b] (0.005)	0.001 (0.004)	0.001 (0.003)
Target slap/all target aggression	0.034 (0.036)	0.010[b] (0.020)	0.010 (0.018)	0.014 (0.027)
Target "other"/all target aggression	0.725 (0.411)	0.271[b] (0.230)	0.461 (0.397)	0.260 (0.193)
Peer retaliated/ target incited	0.301[a] (0.180)	0.306[b] (0.291)	0.394[a] (0.323)	0.140[a] (0.142)
Target retaliated/ peer incited	0.416 (0.336)	0.242[a] (0.280)	0.280 (0.232)	0.169 (0.123)
Peer incited/ target incited	0.663[a] (0.485)	1.452[b] (2.134)	1.714[a] (2.492)	1.239[a] (0.957)

Note. Means represent frequency of first variable per minute divided by frequency of second variable per minute.

[a]Ratio could not be calculated for one subject due to a zero denominator.

[b]Ratio could not be calculated for two subjects due to a zero denominator.

Table 21

Means (and Standard Deviations) of Ratings and Rating Ratios for Boys

	Group			
	A	W	AW	C
Target gave attention to peers	0.876 (0.077)	0.743 (0.163)	0.862 (0.064)	0.834 (0.140)
Target elicited attention from peers	0.708 (0.069)	0.537 (0.146)	0.687 (0.085)	0.642 (0.120)
Peers gave attention to target	0.402 (0.136)	0.248 (0.154)	0.376 (0.162)	0.346 (0.152)
Target gave attention/peers gave attention	2.468 (1.086)	6.416 (8.188)	2.893 (1.821)	2.809 (1.134)
Target elicited attention/peers gave attention	1.940 (0.689)	4.047 (4.329)	2.203 (1.168)	2.090 (0.646)
Target's physical activity (motor level)	0.490 (0.067)	0.451 (0.096)	0.508 (0.079)	0.463 (0.089)

Note. All ratings were on a scale of 0 to 1.

Table 22

Means (and Standard Deviations) of Ratings and Rating Ratios for Girls

	Group			
	A	W	AW	C
Target gave attention to peers	0.878 (0.090)	0.722 (0.216)	0.836 (0.072)	0.852 (0.068)
Target elicited attention from peers	0.689 (0.080)	0.492 (0.162)	0.642 (0.081)	0.634 (0.082)
Peers gave attention to target	0.360 (0.061)	0.260 (0.129)	0.343 (0.125)	0.362 (0.118)
Target gave attention/peers gave attention	2.500 (0.500)	5.045 (6.846)	2.759 (1.028)	2.612 (0.986)
Target elicited attention/peers gave attention	1.951 (0.370)	3.123 (4.007)	2.074 (0.669)	1.891 (0.536)
Target's physical activity (motor level)	0.460 (0.139)	0.354 (0.110)	0.418 (0.086)	0.415 (0.072)

Note. All ratings were on a scale of 0 to 1.

Table 23

Source Table for Analysis of Variance Examining Differences in Percentage of Time Target Children Spent in Play

Source	SS	df	MS	F
School	0.381	1	0.381	8.78**
Sex	0.009	1	0.009	0.20
Group	0.298	3	0.099	2.29
School x Sex	0.002	1	0.002	0.04
School x Group	0.063	3	0.021	0.48
Sex x Group	0.054	3	0.018	0.41
School x Sex x Group	0.044	3	0.015	0.34
Error	4.380	101	0.043	

** $p < .01$

Table 24

Source Table for Analysis of Variance Examining Differences in Percentage of Time Target Children Spent Proximal to Peers

Source	SS	df	MS	F
School	0.484	1	0.484	15.17**
Sex	0.065	1	0.065	2.02
Group	0.091	3	0.030	0.95
School x Sex	0.002	1	0.002	0.07
School x Group	0.061	3	0.020	0.64
Sex x Group	0.061	3	0.020	0.63
School x Sex x Group	0.015	3	0.005	0.16
Error	3.224	101	0.032	

** $p < .01$

Table 25

Source Table for Analysis of Variance
Examining Differences in Percentage of Time
Target Children Spent Alone

Source	SS	df	MS	F
School	0.000	1	0.000	0.00
Sex	0.010	1	0.010	1.56
Group	0.094	3	0.031	5.12**
School x Sex	0.000	1	0.000	0.04
School x Group	0.007	3	0.002	0.37
Sex x Group	0.021	3	0.007	1.15
School x Sex x Group	0.018	3	0.006	0.98
Error	0.620	101	0.006	

** $p < .01$

Table 26

Source Table for Analysis of Variance Examining Differences in Percentage of Time Target Children Spent in a Group

Source	SS	df	MS	F
School	0.009	1	0.009	0.41
Sex	0.025	1	0.025	1.15
Group	0.257	3	0.086	3.93*
School x Sex	0.017	1	0.017	0.80
School x Group	0.079	3	0.026	1.21
Sex x Group	0.039	3	0.013	0.59
School x Sex x Group	0.075	3	0.025	1.15
Error	2.197	101	0.022	

* $p < .05$

Table 27

Source Table for Analysis of Variance Examining Differences in Percentage of Time Target Children Spent with Opposite-sex Peers (Including Time in a Mixed-sex Group)

Source	SS	df	MS	F
School	3.998	1	3.998	165.16***
Sex	0.010	1	0.010	0.43
Group	0.085	3	0.028	1.17
School x Sex	0.006	1	0.006	0.25
School x Group	0.217	3	0.072	2.98*
Sex x Group	0.412	3	0.047	1.95
School x Sex x Group	0.188	3	0.063	2.59
Error	2.445	101	0.024	

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

Table 28

Source Table for Analysis of Variance Examining Differences in Frequency of Touches by Target Children

Source	SS	df	MS	F
School	2.004	1	2.004	9.19**
Sex	0.905	1	0.905	4.15*
Group	6.256	3	2.085	9.56***
School x Sex	0.057	1	0.057	0.26
School x Group	0.352	3	0.117	0.54
Sex x Group	0.423	3	0.141	0.65
School x Sex x Group	0.077	3	0.026	0.12
Error	22.027	101	0.218	

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

Table 29

Source Table for Analysis of Variance

Examining Differences in Frequency of Touches by Peers

Source	SS	df	MS	F
School	0.036	1	0.036	0.20
Sex	0.123	1	0.123	0.67
Group	1.981	3	0.660	3.62*
School x Sex	0.327	1	0.327	1.79
School x Group	0.378	3	0.126	0.69
Sex x Group	0.542	3	0.181	0.99
School x Sex x Group	0.142	3	0.047	0.26
Error	18.439	101	0.183	

* $p < .05$

Table 30

Source Table for Analysis of Variance Examining Differences in Frequency of Aggression Incited by Target Children

Source	SS	df	MS	F
School	0.085	1	0.085	0.41
Sex	5.409	1	5.409	26.37***
Group	3.394	3	1.131	5.52**
School x Sex	0.053	1	0.053	0.26
School x Group	0.768	3	0.256	1.25
Sex x Group	0.079	3	0.026	0.13
School x Sex x Group	0.469	3	0.156	0.76
Error	20.715	101	0.205	

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

Table 31

Source Table for Analysis of Variance

Examining Differences in the Ratio of Aggression

Retaliated by Target Children to Aggression Incited by Peers

Source	SS	df	MS	F
School	0.265	1	0.265	5.60*
Sex	0.134	1	0.134	2.82
Group	0.474	3	0.158	3.34*
School x Sex	0.058	1	0.058	1.22
School x Group	0.020	3	0.007	0.14
Sex x Group	0.180	3	0.060	1.27
School x Sex x Group	0.279	3	0.093	1.96
Error	4.736	100	0.047	

* $p < .05$

Table 32

Source Table for Analysis of Variance
Examining Differences in the Ratio of Frequency
of Punches to Total Frequency of Target Children's Aggression

Source	SS	df	MS	F
School	0.020	1	0.020	7.20**
Sex	0.052	1	0.052	19.08***
Group	0.002	3	0.001	0.29
School x Sex	0.011	1	0.011	3.97*
School x Group	0.010	3	0.003	1.24
Sex x Group	0.008	3	0.003	0.98
School x Sex x Group	0.023	3	0.008	2.83*
Error	0.262	96	0.003	

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

Table 33

Source Table for Analysis of Variance Examining Differences in the Ratio of Frequency of Slaps to Total Frequency of Target Children's Aggression

Source	SS	df	MS	F
School	0.002	1	0.002	0.23
Sex	0.033	1	0.033	4.40*
Group	0.009	3	0.003	0.41
School x Sex	0.033	1	0.033	4.46*
School x Group	0.025	3	0.008	1.11
Sex x Group	0.038	3	0.013	1.71
School x Sex x Group	0.034	3	0.011	1.52
Error	0.710	96	0.007	

* $p < .05$

Table 34

Source Table for Analysis of Variance Examining Differences in Frequency of Aggression Incited by Peers

Source	SS	df	MS	F
School	0.277	1	0.277	2.04
Sex	2.887	1	2.887	21.29***
Group	1.218	3	0.406	2.99*
School x Sex	0.122	1	0.122	0.90
School x Group	0.880	3	0.293	2.16
Sex x Group	0.813	3	0.271	2.00
School x Sex x Group	0.749	3	0.250	1.84
Error	13.697	101	0.136	

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

Table 35

Source Table for Analysis of Variance

Examining Differences in the Ratio of Aggression

Retaliated by Peers to Aggression Incited by Target Children

Source	SS	df	MS	F
School	0.013	1	0.013	0.29
Sex	0.001	1	0.001	0.01
Group	0.368	3	0.123	2.69*
School x Sex	0.025	1	0.025	0.54
School x Group	0.144	3	0.048	1.05
Sex x Group	0.568	3	0.189	4.16**
School x Sex x Group	0.375	3	0.125	2.75*
Error	4.323	95	0.046	

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

Table 36

Source Table for Analysis of Variance
Examining Differences in the Ratio of Aggression
Incited by Peers to Aggression Incited by Target Children

Source	SS	df	MS	F
School	45.615	1	45.615	16.43***
Sex	0.562	1	0.562	0.20
Group	41.236	3	13.745	4.95**
School x Sex	0.301	1	0.301	0.11
School x Group	25.384	3	8.461	3.05*
Sex x Group	1.796	3	0.599	0.22
School x Sex x Group	5.036	3	1.679	0.60
Error	263.725	95	2.776	

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

Table 37

Source Table for Analysis of Variance Examining Differences in Attention Target Children Gave to Peers

Source	SS	df	MS	F
School	0.216	1	0.216	17.85***
Sex	0.000	1	0.000	0.03
Group	0.365	3	0.122	10.06***
School x Sex	0.004	1	0.004	0.35
School x Group	0.073	3	0.025	2.03
Sex x Group	0.022	3	0.015	0.62
School x Sex x Group	0.045	3	0.015	1.24
Error	1.221	101	0.012	

*** $p < .001$

Table 38

Source Table for Analysis of Variance
Examining Differences in Target Children's Efforts
to Elicit Attention from Peers

Source	SS	df	MS	F
School	0.053	1	0.053	5.23*
Sex	0.026	1	0.026	2.63
Group	0.603	3	0.201	19.93***
School x Sex	0.000	1	0.000	0.04
School x Group	0.145	3	0.048	4.80**
Sex x Group	0.012	3	0.004	0.40
School x Sex x Group	0.012	3	0.004	0.40
Error	1.019	101	0.010	

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

Table 39

Source Table for Analysis of Variance
Examining Differences in Attention Peers
Gave to Target Children

Source	SS	df	MS	F
School	0.031	1	0.031	1.75
Sex	0.008	1	0.008	0.47
Group	0.282	3	0.094	5.33**
School x Sex	0.003	1	0.003	0.19
School x Group	0.105	3	0.035	1.99
Sex x Group	0.021	3	0.007	0.39
School x Sex x Group	0.018	3	0.006	0.34
Error	1.778	101	0.018	

** $p < .01$

Table 40

Source Table for Analysis of Variance Examining Differences in the Motor Level of Target Children

Source	SS	df	MS	F
School	0.038	1	0.038	4.57*
Sex	0.136	1	0.136	16.27***
Group	0.089	3	0.030	3.57*
School x Sex	0.011	1	0.011	1.34
School x Group	0.023	3	0.008	0.94
Sex x Group	0.037	3	0.012	1.49
School x Sex x Group	0.028	3	0.009	1.13
Error	0.845	101	0.008	

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

Appendix F

Statistical Figure

Figure 1

Discriminant Function Group Centroids