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Teacher Reports and Naturalistic Observation of Peer-identified Patterns of Aggression and Withdrawal

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ABSTRACT

Teacher Reports and Naturalistic Observation of Peer-identified Patterns of Aggression and Withdrawal

Keith Marchessault

Peer ratings, teacher ratings, and behavioural observation are among the most frequently used techniques in the assessment of childhood maladjustment. However, little is known about the way these measures covary in the description of an individual child. The present study addresses this issue with respect to a sample of 73 elementary school children identified by their peers as Aggressive, Withdrawn, Aggressive-withdrawn, and Contrast. Children's behaviour was rated by classroom teachers and videotaped unobtrusively on the playground. Thus, assessment was obtained from three different perspectives. Relationships of teacher ratings and observational data to peer ratings were investigated using discriminant function and canonical correlation analyses. Relationships varied across sex and behavioural dimension while ratings of aggression provided the most consistently strong relationship. Ratings of withdrawal, by comparison, were influenced by the sex of the target child and the type of assessment source involved. Most notably, teacher and peer ratings of withdrawal in boys showed adequate agreement, while there was a tendency for teachers to underestimate peer-rated withdrawal in girls. The results suggest the presence of several biases on the part of both raters and instruments. Their implications in the selection of assessment methods for both the screening of at-risk children and research into the etiology of childhood psychopathology are discussed.

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Teacher Reports and Naturalistic Observation of Peer-identified Patterns of Aggression and Withdrawal

The prevalence of psychopathology is such that few families are spared the anguish of watching at least one close friend or relative suffer its debilitating effects. Not only does mental illness carry a heavy cost to society but also, perhaps more importantly, a loss of personal productivity and enjoyment of life for all who are closely involved. For the growing child such problems, although typically less severe, are perhaps even more serious. They often contribute to an interrupted education, impoverished social experience, and irregular peer relationships any one of which can have long-term negative implications. In fact, it is this very relationship that has been, and presently is, the focus of a great deal of research.

The predictability of adult mental health from childhood behaviour is "probably the single most important area of study of clinical theory and practice with children" (Kohlberg, LaCrosse, & Ricks, 1972, p. 1217). Among the more impressive works is Robins' (1966) 30-year follow-up of 500 individuals seen initially as children in a clinic setting because of early deviant behaviour. She found that there were several important long-term correlates of early dysfunction including a higher incidence of arrest, divorce, hospitalization, and alienation. Similar correlates of childhood deviance have been reported by other investigators using a variety of research designs (e.g. Cowen, Pederson, Babigian, Izzo, & Trost, 1973; Janes & Hesselbrock, 1978; Prinz, Swan, Weintraub, & Neale, 1978; Roff & Sells, 1968; Rolf, 1976; Ullmann, 1957; Watt, Stolorow, Lubensky, & McClelland, 1970). Although the processes

relating early and later maladjustment are still generally only speculative, the relationship appears to be firmly established and worthy of additional attention (see survey by Kohlberg, LaCrosse, & Ricks, 1972).

Much of the impetus for further investigation is provided by the belief that deviant behaviour is more easily modified in childhood. Zax and Cowen (1970), in support of preventive intervention programs, suggest that maladaptive behaviour in young children is less firmly established and shows greater plasticity and modifiability than that of older children. Asarnow (1983) found support for the assumption of more "entrenchment" of deviant behaviour with age. Olweus (1981) reached a similar conclusion with respect to aggressive and inhibited/withdrawn patterns in childhood. Thus, the advantages of early treatment of children demonstrating deviant patterns of behaviour is evident if one hopes to maximize its efficacy.

However, despite the recognized urgency for a child with problems, many who are in need of psychological services are not receiving them. Several factors seem to contribute to the degree of lethargy that exists in the referral process, among them the child's family itself. Anthony (1968) has reported that the families of maladjusted children often learn to tolerate or cope with the child's deviant behaviour. In such cases it is possible that they would be less likely to refer their son or daughter for help for fear of disrupting the equilibrium that has already been attained. Problems also exist with teachers as a source of referral. Due to the fact that tranquility is generally considered to be the preferred mode of behaviour in the classroom (Winnett & Winkler, 1972), teachers are more likely to refer students who are disruptive

than those who are shy and withdrawn (Greenwood, Walker, & Hops, 1977). Girls, specifically, are less likely to be referred, since passive behaviour is considered appropriate and aggression is less common in females. Further, McCoy (1976) has reported that there is some evidence to suggest that clinical decisions made about children, once they have been referred, depend almost entirely on the content of their parents' reports, which themselves are often compromised by certain biases. It would seem that this fact could only serve as an additional impediment to the rapid and appropriate allocation of mental health services. Although only a few of the factors interfering with the referral process have been enumerated, they clearly indicate that a more organized and rigorous approach is required if children who may benefit from early intervention are to be identified. The existing system, although providing services for many children, often misses those who need help the most (McCoy, 1976).

Development of Screening Procedures - Several Stages

In response to these problems, there has been an increasing interest in screening techniques designed to effectively identify children who are presently disturbed and/or at-risk for developing more serious psychopathology at a later time. An increasing number of studies have highlighted the importance of the relationship between social competence, as evaluated by one's peers and mental health (e.g. Hartup, Glazer, & Charlesworth, 1967). Hymel and Rubin (in press) cite important research (e.g. Cowen et al, 1973; Kupersmidt, 1983; Roff, 1961; Roff, Sells, & Golden, 1972; Ullmann, 1957) reporting that children with "peer relationship" problems in early life tend to be at-risk in terms of their later life adjustment. However, Hymel and Rubin

caution that poor peer relationships result from a variety of sources and that "poor" can be defined in many ways. Among the more precise labels that they offer as characteristic of such children are: unpopular, rejected, neglected, isolated, withdrawn, impulsive, and aggressive. It is hardly likely that each of these problems would carry the same long-term consequences nor would they require the same type or degree (intensity) of intervention. To extend this argument one step further, terms such as those listed above (unpopular etc.) are still insufficient for reasons of lack of specificity. Thus one of the early stages in the development of screening/assessment techniques involves the differentiation of specific patterns of behaviour that children with problems might exhibit.

Factor analytic studies Various research strategies are employed in the investigation of childhood problems and the course that they take. Factor analytic studies of the behaviour of clinically referred vs. nonreferred children constitute an important source of information on the nature of childhood pathology. These studies, typically employing large populations of children, are aimed at generating a taxonomic framework within which training, treatment, epidemiology, and research can be integrated (Achenbach & Edelbrock, 1978). An example of such research is Achenbach's (1966) factor analytic approach to the behaviour problems of 300 4- to 15-year old boys and girls, including outpatients and short-term patients. Through statistical analysis Achenbach was able to derive two principal components as well as a number of rotated factors for both boys and girls. Several of the rotated factors were later subsumed by the principal (broad-band) components. Achenbach and Edelbrock (1978)

provide a comprehensive review of factor analytic studies of childhood behaviour problems and conclude that there is still a need for a classification of children's problems that will be useful to researchers and clinicians alike.

High-risk studies A second strategy, one which is an important adjunct to the factor analytic study in the investigation of childhood pathology, is generally referred to as high-risk research. The goal of high-risk research is to uncover the etiology of adult pathology through the investigation of its antecedents. Studies of this nature hope to determine precursors or early indicators of maladjustment that will eventually lead to the development of early intervention programs on behalf of individuals showing high-risk "signs". They have, in the past, followed a number of orientations including investigations of genetic, sociogenic, environmental, and behavioural indices (see review, Garmezy, 1972). To improve the yield of useful information, prospective methods typically identify children on the basis of certain criteria that are hypothesized to put them at-risk of developing later problems. The children's development is subsequently monitored over the course of a number of years to determine whether the selection criteria did, in fact, predispose them to later maladjustment. A close monitoring of the child, if feasible, may suggest the social, emotional, and cognitive patterns as well as family and sociogenic variables that intensify an initial predisposition. Although far more costly and time consuming, the prospective approach reduces the effects of a number of biases inherent in retrospective reports. Data are collected in a far more objective manner and, in addition, high-risk children who do not develop pathologies provide an excellent comparison group in order to determine

under which conditions some childen are able to "beat the odds". This must not be interpeted as suggesting that intervention should be provided on behalf of all at-risk children. Rather, the aim of a prospective approach is to identify those children from among a high-risk sample who are most in need.

Behavioural correlates of maladjustment The aforementioned strategy has enabled clinical researchers to identify a variety of factors that appear to predispose a child to later problems. One direction that seems to be especially promising, and is most relevant to this study and to the development of screening techniques, involves an attempt to predict later pathology by identifying those children whose functioning already shows some signs of maladjustment. Within these studies two broad dimensions, under which nearly all childhood problems can be classified, have been consistantly identified. These dimensions have been labelled "undercontrolled" and "overcontrolled" by Achenbach and Edelbrock (1978) but could be easily identified by a variety of other names that have been used in the literature. The undercontrolled dimension includes aggressive, externalizing, acting out, and conduct-disorder type behaviours while the overcontrolled dimension appears to be representative of withdrawn, internalizing, shy-anxious, and inhibited tendencies. A review of the research identifying these two dimensions as concurrent and precursive to maladjustment is not attempted here although several examples will provide a flavour of their findings.

The undercontrolled, often labelled "aggressive", pattern of childhood behaviour has received a great deal of attention in the literature perhaps due to the unpleasant quality that it generally holds

for adults. Not only has it been found to be a highly stable personality characteristic (Olweus, 1979), but also is predictive of a variety of adolescent and adult problems. In fact, longitudinal research evidence suggests that patterns of aggression, violence, and disobedience are the most powerful predictors of later adjustment problems of any childhood behaviour studied (Kohlberg et al, 1972). Support for this statement comes from a number of sources. In the Robins (1966) study, it was found that "no child without frequent or serious antisocial behaviour became a sociopathic adult", while the percentage of children with such episodes who later became sociopathic personalities was 37%. Other research has indicated that aggression predicts current psychological disturbance (Bower, 1969), later general maladjustment (Janes & Hesselbrock, 1978), child abuse (George & Main, 1980), and later psychiatric hospitalization (Roff, Knight, & Wertheim, 1976; Rolf, 1976).

On the other hand, the overcontrolled pattern, often referred to as "withdrawn" or "isolatory" behaviour, historically was not considered to be precursive to later psychopathology (e.g. Morris, Soroker, & Burris, 1954). However, social withdrawal, especially in young school age children, has been increasingly recognized as a serious behaviour disorder by many mental health practitioners (Amidon & Hoffmann, 1965; Bonney, 1971; Greenwood, Walker, & Hops, 1977; Strain, Cooke, & Apolloni, 1976). Greenwood et al (1977) suggest that a child's ability to initiate and maintain positive social interactions with others is an essential developmental achievement, and that its absence may retard the normal course of social and emotional development. It is likely that controversy over the negative long-term consequences of childhood social

withdrawal is partially due to an overgeneralized use of the term. Asher and Hymel (1981) suggest that the focus should be on the quality rather than the quantity of interaction when evaluating the socially isolated or withdrawn child. They differentiate withdrawal, due to a low frequency of interaction, and isolation, resulting from rejection by peers, as two very different processes. It is clear that each may predict later difficulties but that the nature of such difficulties may call for very different treatment approaches.

Development of Procedures for Identification

The previously described stages of screening/assessment research were aimed at generating an understanding of patterns of deviant behaviour in childhood and how each are related to later adjustment problems. As noted, extensive work in this area has provided the beginnings of a comprehensive picture of childhood psychopathology. However, while high-risk and factor analytic studies have identified patterns of behaviour to focus on, they have contributed only minimally to the process of screening for such behaviour in the child population. Screening procedures are essential if clinicians are to make use of the information that the previous methods have provided.

In the past, clinicians have relied heavily on three main sources of information to help identify children who are experiencing problems: peer ratings, teacher ratings, and behavioural assessments (Hymel & Rubin, in press). Parents constitute a fourth source but are often considered poor consultants for screening purposes for a number of reasons. Above all, parents are frequently biased in their reporting of a child's past and present levels of adjustment (Burton, 1970; Haggard, Breckstad, & Skard, 1960; Mednick & Schaffer, 1964; Yarrow, Campbell, &

Burton, 1970). In addition, they are less frequently exposed to a sizeable normative sample of children and thus are less aware of what might be considered age appropriate behaviour. Finally, it is often the case that parents are not receptive to the idea of discussing the family's problems with a stranger. Peer, teacher, and behavioural assessments, on the other hand, can be obtained within the school setting and generally without too much interference in the daily routine. Other advantages include the availability of a large sample of same-age peers for comparison as well as far less potential for social desirability bias in the reports. Essentially, the elementary school presents an ideal milieu within which to screen for children suffering from various forms of psychopathology or maladjustment. A brief description of each of the aforementioned procedures follows.

Peer ratings Several major techniques exist by which peers can be used as informants to identify children with varying degrees of maladjustment. Among them, sociometric techniques and peer assessment measures have probably enjoyed the most popularity. Based on the peer nomination measure developed by Moreno (1934), sociometric techniques typically require children to name their best friends and/or peers with whom they whould like to work or play. Negative criteria have also been used (e.g. "Name three classmates you don't like very much") although they are considered ethically unacceptable in many regions. In both cases a child's score is related to the number of nominations received from peers (see review articles, Foster & Ritchey, 1979; Asher & Hymel, 1981). One of the limitations of a nomination sociometric is that one only learns about the child's view of those peers he or she chooses to nominate (Asher & Hymel, 1981).

Several variations on the use of this procedure have included the use of pictures (McCandless & Marshall, 1957), and rating scales (Asher, Singleton, Tinsley, & Hymel, 1979; Singleton & Asher, 1977). In the rating scale measure children are asked to circle a number, from 1 to 5, that best describes how much they like to play (or work) with each of the peers in their class. Thus, a child's score on this measure is the average rating received from all classmates. One advantage of this type of measure is that every child is rated by every other child unlike the nomination technique. This tends to contribute to a more stable evaluation of the class structure on the categories measured allowing for a more fine-grained analysis of the data (Oden & Asher, 1977). Both the sociometric and rating scale measures have been used successfully in research attempting to establish a child's social status relative to other children in a group, but unfortunately they provide very little description of the behaviour that contributes to such a placement.

Alternative to the traditional peer evaluation measures are peer assessment instruments which do give specific information concerning the behaviour of the peers. A common instrument is the Pupil Evaluation Inventory (PEI) (Pekarik, Prinz, Liebert, Weintraub, & Neale, 1976). The PEI, used in the present study, consists of 35 items. The names of the children in the class, along with a code number, are presented on a separate sheet to each child. They are then asked to nominate the children in their class that meet the item description (e.g. "those who make fun of people" or "those who have very few friends"). Factor analysis has revealed three homogeneous and stable factors: Aggression, Withdrawal, and Likeability. In addition, test-retest reliability, internal consistency, and concurrent validity (comparisons with teacher

ratings) range from satisfactory to high depending on the factor (Ledingham, Schwartzman, Younger, & Bergeron, 1982; Pekarik et al., 1976). However, the main advantage of this instrument is the fact that it includes many behavioural descriptors among its items. Thus, while the factor scores might be used for preliminary identification of children with problems, the individual items provide a more detailed description of the types of problems that the child is experiencing. In fact, Kane and Lawler (1978) suggest that peer assessment instruments, such as the PEI, may overcome a major limitation of sociometric instruments, namely that they do not specify behavioural correlates of sociometric status. For screening purposes an instrument such as the PEI may represent a valuable pre-post treatment outcome measure and thus serve a dual role in early intervention programs.

Teacher ratings Teacher ratings and nominations have been extensively used in the initial screening of children who are thought to be experiencing adjustment difficulties (Greenwood, Walker, Todd, & Hops, 1979; Gresham, 1981; Strain, Cooke, & Apolloni, 1976; Strain & Kerr, 1981). Based on the belief that popularity is closely related to degree of adjustment (e.g. social competence), one of the most frequently used strategies has been to ask teachers to rank order the children in their class in terms of their relative preference as a playmate (Connolly & Doyle, 1981; Green, Beck, Forehand, & Vosk, 1980).

Teacher ratings of the above type, however, like the peer sociometric techniques, tell us little about the behavioural correlates that determine social status (Hymel & Rubin, in press). It is true that further consultation could provide a more detailed description of an identified child, but probably not in a systematic and unbiased manner.

For screening purposes, there exist a number of alternatives to teacher sociometrics that provide a more refined description of a child's competencies and weaknesses. Although, each is typically only appropriate for a particular age range, the majority appear to identify several factors (i.e. aggression and withdrawal) similar to those identified by previous factor analytic studies (e.g. Edelbrock & Achenbach, 1984; Behar & Stringfield, 1974; Spivack & Spotts, 1966). This suggests that teacher assessments of this type are indeed useful as screening instruments.

One of the most recently developed instruments is the Teacher Report Form of the Child Behavior Checklist (Edelbrock & Achenbach, 1984). Not only does it include eight narrow band factors (including aggression and withdrawal) and two broad band factors (internalizing and externalizing), but also provides separate scoring profiles for boys and girls. This is considered to be an important feature due to sex differences in teachers' perceptions of deviant social behaviour (LaGreca, 1981).

Behavioural observation Researchers have increasingly relied on direct observation of social behaviour in recent years (see review, Mitchell, 1979) and it has been suggested that behavioural observation of children's peer relationships are the most face valid method of assessment (Hymel & Rubin, in press). Foster and Ritchey (1979), in a review of assessment methods, refer to observational data as being objective and requiring only minimal inference about what the data represent. Behavioural observation can take a wide variety of forms depending on the age group being assessed and the desired milieu within which to assess them as well as the type of behaviour being observed.

Some of the options available include indoor vs. outdoor, naturalistic vs. contrived, structured-task vs. free-play, and obtrusive vs. unobtrusive observation. Of course there are pros and cons associated with each of these choices and the decisions depend entirely on the resources available as well as the aims of the observation. For example, if one intends to focus on altruistic or helping behaviour in particular it would probably be advantageous to use a structured-task, indoor, unobtrusive, and contrived observational setting. Structured-task group behaviour within a contrived situation would likely elicit more instances (i.e. increase the probability) of the behaviour of interest, while the unobtrusiveness would limit the possibility of the behaviour under observation simply being reactive to the presence of an adult.

However, most studies fail to find behavioural correlates of peer or teacher rated maladjustment, and Asher and Hymel (1981) suggest that this failure is due to situational constraints (e.g. observations done in the classroom). Despite the flexibility of the observational design and the relative respect with which behavioural observation is regarded (Foster & Ritchey, 1979; Gottman, Gonso, & Rasmussen, 1975; Greenwood, Walker, Todd, Hops, 1979; Gresham, 1981), there are suprisingly few studies examining unstructured social behaviour of elementary-school aged children (Foster & Ritchey, 1979; Ladd, 1983). By far, the majority of studies examining unstructured social behaviour to date have focused on preschool children due to the informal nature of the nursery and daycare curriculum as well as the large amounts of time spent in free-play. Studies focusing on older children are rare due to the very limited opportunity to observe them in an unconstrained, free-play

situation. Thus, there appears to be a demand for naturalistic observation of school-aged children during free-play if one hopes to discover the specific behaviours associated with social competence in these formative years.

The availability of several effective procedures for identifying children who are presently disturbed and/or at-risk for developing more serious psychopathology raises a number of valid questions. Above all, given the choice, which source should be consulted in an attempt to target children with problems? That is, assuming that one cannot tap every available source, which one, or combination, of the screening procedures is likely to reliably identify "the real McCoy" (Cowen et al, 1973, p. 445). In making such a decision the clinician or researcher must realize that there are many important theoretical, practical, and ethical considerations that should be thoroughly examined. Although only the theoretical issues are directly related to the present study, all three will be briefly reviewed as background to the remainder of the paper.

Practical, Ethical, and Theoretical Issues

Peers represent a practical source to consult in screening attempts both in terms of time and money. Not only do some of the peer instruments allow for administration to an entire class at once but they can also be administered in a relatively short period of time. Depending on the complexity of the procedure, it may also be possible to make do with a single examiner (tester) thus further reducing expenses. Teacher forms are equally as efficient in terms of money and energy expended. They typically are completed by teachers outside of class time and thus are in no way disruptive of the classroom routine.

Behavioural observation, on the other hand, is very expensive and time consuming, especially if one's goal is to collect a representative and stable sample of the child's, or children's, behaviour. Moskowitz and Schwarz (1982) found that rather large samples of behaviour are required to capture the consistency (e.g. stability) of such constructs as dominance and dependency. Both teachers and peers as sources are far more cost effective than behavioural observation, and at a time when cost accountability is essential (Zigler & Trickett, 1978), this is a very serious consideration.

Ethical issues are another important consideration in terms of the effect that a screening intervention could have on the children themselves. Negative peer nominations and ratings are simply not permitted in many regions due to the possible negative consequences of having children rate their peers (Asher & Hymel, 1981; Foster & Ritchey, 1979; Greenwood, Walker, Todd, & Hops, 1979). Asher and Hymel (1981), in reference to negative nomination procedures, report that "some parents and teachers fear that such measures will implicitly signal to their children that saying negative things about others is sanctioned" (p. 134). Hayvren and Hymel (in press), on the other hand, have reported that there are no such negative effects particularily if proper precautions are taken such as not administering the sociometric immediately before a recess period when children might be likely to discuss the nominations that they made.

Teacher reports, by comparison, are far more discrete and can generally be relied upon to protect the identity of the children who are the focus of the assessments. However, the use of teachers as informants presents a different type of problem as has been documented

by Rosenthal and Jacobson (1966; 1968) in their investigation of the Pygmalion effect. They found that teacher's expectations, even though suggested by an external authority, can have a significant effect on a child's subsequent achievement. Although the suggested expectations in their study were always positive (e.g. Johnny is an "intellectual bloomer"), these results might lead one to question the effects that a negative expectation could have.

Finally, behavioural observation can, depending on how it is carried out, be less intrusive than peer assessment techniques in terms of degree of reactivity to the procedure. It can also, on the other hand, be more intrusive. Due to the large amounts of time required to collect behavioural observations, if not carried out discretely, they offer sufficient opportunity for the more curious students to develop hypotheses concerning the goals and particular targets of the observer. However, observational assessments need not be intrusive and, further, often the least intrusive are those that provide the most naturalistic data (e.g. Serbin, Lyons, Marchessault, & Morin, 1983).

Theoretical issues pertaining to assessment instruments, the focus of the present study, are generally concerned with the predictability, reliability, and validity of the various techniques. These issues, along with those previously presented, determine an instrument's utility and/or desirability over other available methods. One of the early central issues has been the ability of the different sources to reflect present, and predict future, levels of adjustment. A favorite focus here has been the peer assessment techniques, greatly due to the work of Cowen et al. (1973). Using at-risk criteria based on social work interviews, group psychological evaluations (grade 1), classroom

observation, peer judgements, and teacher reports, they identified children who gave evidence of manifest or incipient maladaptation ranging from moderate to severe. The target children's development was subsequently monitored, and at an 11-13 year follow-up the early detected at-risk children were found to have disproportionately high later appearances on a community-wide psychiatric register. Retrospective analyses of elementary school test data indicated that peer judgement was, by far, the most sensitive predictor of later psychiatric difficulty. Rolf (1976) has supported this finding with respect to peer-rated social incompetence and externalizing behaviour disorders. He suggests that these indices are the best predictors of poor adult outcome in a high risk sample. These studies ran contrary to the general consensus at the time, namely that teacher and parent judgements correlated more robustly with adjustment indices than did peer measures (Liem, Yellot, Cowen, Trost, & Izzo, 1969; Yellot, Liem, & Cowen, 1969), and that young children are not especially perceptive or reliable judges.

Several explanations have been put forth to attempt to account for this sensitivity on the part of the peers. Among the more plausible is Hymel and Rubin's (in press) suggestion that peers are "inside" sources of information and therefore can identify behaviours and characteristics which are considered relevant from the perspective of those who in fact determine the degree of integration within the peer group. Peer assessments are also derived from a large number of observers whose ratings are based on a wider range of experiences with the "target" child and who are more likely to have witnessed low frequency, but psychologically significant, events. It is well documented, and

intuitively obvious, that children behave differently when alone with peers than they do when adults are present (Hartup, 1979). Thus peers probably have the opportunity to see certain behaviours that an adult might never witness.

Teachers, by comparison, are also in a rather unique position for assessing a child's overall level of functioning. Children spend a great deal of their time in school, an environment that is representative of the work, competitive, and social demands with which they will eventually have to cope (Weintraub, Neale, & Liebert, 1975). Also, as mentioned previously, teachers have the opportunity to compare a child's adjustment with that of the other children representing a normative contrast. Thus, it is not surprising that teachers have been found to be able to appraise current levels of adjustment with considerable reliability (Lambert & Bower, 1961; Ullmann, 1957; Zax, Cowen, Izzo, & Trost, 1964). In fact, Kellam and Schiff (1967), in a screening of 2000 children, found significant agreement between teacher ratings and those done by clinicians. Janes and Hesselbrock (1978), upon a 9-15 year follow-up of clinically referred children, concluded that teacher ratings can be useful predictors of adjustment, especially if focused on the child's peer relationships. They also noted that clinic-referred girls were typically pictured as withdrawn and depressed by teachers while referred boys were seen as disobedient and disagreeable.

Finally, behavioural observation, although considered to be the most face-valid and objective method of assessment (Foster & Ritchey, 1979), has not enjoyed the degree of predictability found in other assessment procedures. The majority of work in this area has examined

the ability of observational measures to predict current, as opposed to future, levels of functioning and has almost always focused on withdrawn or isolate behaviour (Hymel & Rubin, in press). For example, a number of studies (e.g. Greenwood, Walker, Todd, & Hops, 1979; Rubin, Daniels-Bierness, & Hayvren, 1982) have reported only a slight relationship between the observed rate of interaction and measures of peer popularity, and, in some cases, no relationship at all (Hymel & Asher, 1977). Asher, Markell, & Hymel (1981) criticize the utility of such a variable as a behavioural predictor and suggest that measures of the quality of the interaction would demonstrate greater predictive and concurrent validity. Further, Asher and Hymel (1981) have suggested that critical variables relating to peer popularity tend to change with age, and that older children may focus more on behavioural dimensions that are less readily observable. Thus, there is considerable indication that the foci of behavioural observations (i.e. behaviours to be observed) must be carefully chosen if any degree of predictability is hoped for. Those variables that seem to be intuitively obvious behavioural correlates of maladjustment are not always readily observed, even in what appear to be ideal observational situations.

Perhaps even more interesting than the overall predictive validity of a particular assessment source is its predictability and reliability when a high-risk group is broken down by sex and type of deviant behaviour. As noted previously, childhood psychopathology is by no means a unitary process, and thus, to mix boys and girls and externalizers and internalizers could only serve to cloud the very issues that clinical researchers are attempting to clarify. The treatment plan for children in need of mental health services, as well

as the urgency of referral and long-term prognosis vary depending on the subgroup and the severity of the problems that are exhibited. Thus, a significant body of research has focused on the differential predictability and validity of assessment sources across the more common forms of childhood psychopathology. The general strategy for this type of research has been to contrast ratings of target children from the point of view of two or more assessment sources. The rationale, of course, is that agreement between multiple raters suggests concurrent validity thus providing validation of the instruments. Strain and Kerr (1981), for example, have suggested that teachers are more likely to refer socially aggressive children as opposed to those demonstrating socially isolated or withdrawn behaviour. Ledingham, Younger, Schwartzman, & Bergeron (1982) have shed some light on this result with their finding that agreement between teachers and peers is greater for ratings of aggression than for withdrawal or likeability. Further, peers rated the withdrawn children as more extreme in terms of withdrawal than did the teachers. Together these studies might suggest a greater salience for teachers of aggressive over withdrawn types of behaviour contributing to different levels of validity in the reporting of each.

On differences between sexes, LaGreca (1981) has reported that teacher perceptions of the social behaviours contributing to peer acceptance may vary depending on the sex of the child. For instance, teacher judgements of a child's peer likeability may differ from peer ratings, especially for females. LaGreca suggests that teacher judgements of likeability may be biased by factors other than the type of social behaviour displayed by the child.

Other studies have found varying degrees of specificity in teacher assessments. For example, Green et al. (1980), in a behavioural validation of teacher ratings, reported that teachers can identify children who are having difficulties in the classroom, but found no evidence to suggest that teachers can reliably differentiate between conduct and withdrawal problems. By comparison, Rubin and Clark (1983) found intuitively appropriate behavioural correlates of teacher rated hostile-aggressive and anxious-fearful behaviour.

In contrast to the breadth of research investigating the peer-teacher and teacher-behavioural relationships, few studies have examined the correspondence between problems identified through peer assessments and observed behaviour (Hymel & Rubin, in press). This relationship is especially important in light of reports of halo effects in children's descriptions of peers. Yarrow and Campbell (1963), for example, found that regardless of observed friendly and aggressive behaviour, children who were popular were described by peers as more friendly and less aggressive than their less popular classmates. One study investigating the peer assessment-behaviour observation relationship is Asarnow's (1983) observation of boys who were either extremely positively or negatively evaluated by peers on Bower's (1969) Class Play. She found a variety of behavioural correlates including fewer positive peer contacts and more negative peer contacts involving the negatively evaluated boys. However, Asarnow did not specify more detailed peer assessment categorizations such as "aggressive" or "withdrawn" thus it is difficult to elaborate on the degree of relationship between the two assessment sources.

Summary

Although only a sampling of the research in this area has been presented it is evident that considerable variation exists among reports of a given child by different sources (e.g. teachers, peers, and behavioural observation). It is difficult to know which source, or combination of sources, can be considered the standard against which all other assessment techniques should be validated. Behavioural observation, considered by many to be the criterion data source (Hymel & Rubin, in press), is not without certain problems that limit its validity. Observational studies, for instance, necessitate the development of a "code" according to which the observed behaviour is translated into analyzable form. The a priori selection of critical variables to be included is often affected by certain biases in the researcher's orientation which, in turn, colours the information that is taken from the raw data itself. The selected variables may, or may not, reflect the values of the peer group being observed (Hymel & Rubin, in press). Of course the equivalent can be said for both teacher and peer ratings. They too may reflect the biases of those that develop the instruments.

The investigation of the relationships that exist between the different assessment procedures/sources is an important research focus for several reasons. First, behavioural observations, peer ratings, and teacher ratings appear to generate data on different dimensions of child behaviour (Greenwood, Walker, & Hops, 1977). This may be due to the different milieus serving as a reference for the ratings, or to the variable salience of particular dimensions of behaviour to each assessment source. Nevertheless, it is probable that all three sources

are essential to a comprehensive description of childhood psychopathology and its relationship with later maladjustment. A second important reason for investigating the relationship among various assessment sources serves as the more central issue to be addressed in this study. As described in the previous rationale, early referral of a child experiencing poor peer relationships and displaying deviant behaviour is desirable if positive treatment effects are hoped for. However, despite the urgency, it would not be considered ethical to conduct mass screenings or to err in the direction of providing treatment in order to avoid missing a needy child. Nor would available resources allow for such an undertaking. Instead, the mental health practitioner has to make efficient use of the sources that are available for assessments of children thought to be at-risk. Among the procedures that have been described in the preceeding pages, each has certain merits and limitations that must be thoroughly considered with respect to the aims of the assessment.

Foster and Ritchey (1979) and Gottman, Gonso, and Rasmussen (1975), for example, strongly emphasize the need for studies based on naturalistic observations of peer interactions as an essential first step in designing intervention programs to aid children who lack certain skills. By the same token, observation can be used to identify the foci of treatment plans for individual children. However, observational data is expensive and time consuming to obtain.

Peer assessments, on the other hand, are frequently considered to be the best predictors of later maladjustment (Cowen et al, 1973; Rolf, 1976). Perhaps, by this token, they are a natural first step in the assessment of a child thought to be at-risk. However, as mentioned

earlier, there are serious ethical issues related to the use of peers as informants.

Finally, teacher reports are obviously the most expedient of all the available procedures and have been found to have reasonable predictive validity (Kellam & Schiff, 1967; Lambert & Bower, 1961; Ullmann, 1957; Zax et al, 1964). If it can be determined that teacher reports are highly correlated with both peer assessments and behavioural observations then they may serve as an effective means for streamlining the assessment procedure as well as maximally maintaining confidentiality.

However, despite the pros and cons that are associated with each of these often consulted sources, it is likely that they will continue to be used in the assessment of childhood pathology. In fact, Harris, Drummond, and Schultz (1977) suggest that, due to the lack of total congruence between measures, the use of multiple sources for screening and assessment purposes should be mandatory. Futher, many researchers (e.g. Foster & Ritchey, 1979; Greenwood, Walker, & Hops, 1977; Hymel & Rubin, in press; Ledingham et al, 1982; Rolf, 1976) consider all three to be important sources of information among which the covariation in the description, identification, and assessment of child psychopathology needs to be thoroughly investigated.

Purpose of the Present Study

The present study was designed to investigate the specific relationships among three frequently used assessment sources; teacher ratings, peer ratings and behavioural observation.

In order to maximize the yield of information it was decided to use one of the three aforementioned sources as a selection criterion in

order to identify an at-risk sample. Based on Cowen et al's (1973) and Rolf's (1976) conclusions that peers are the best predictors of later maladjustment, a peer sociometric was selected for this purpose. During the latter part of October the Pupil Evaluation Inventory (Pekarik et al, 1976) was administered to all children in grades 4 and 5 at a French language school in Montreal. Subsequently, their scores on the two broad behavioural dimensions of aggression and withdrawal were used to identify three groups of children reported to have atypical social behaviour and a contrast group. The peer-identified groups included 1) those children who scored extremely high on aggression, but low on withdrawal, 2) those scoring extremely high on withdrawal, but low on aggression, 3) children scoring high on both aggression and withdrawal, and finally, 4) the contrast children whose aggression and withdrawal scores fell near the class mean.

The two remaining assessment measures were then acquired, for the target children only, over the course of the school year. Behavioural observations on the playground were collected from December through June while the Teacher Report Form of the Child Behavior Checklist (Edelbrock & Achenbach, 1984) was administered in February. It was believed that the teachers were sufficiently familiar with the children at that point to reliably complete the teacher ratings.

Two main questions are examined in the study although they are closely related and could be considered a single focus. First, the study investigated the differential ability of the teacher ratings and the behavioural observations to predict to the peer ratings of the target children (i.e. the peer-identified categories). Further, previous research has indicated that agreement between assessment

sources appears to be a function of the type of behaviour being rated (Ledingham, et al, 1982) as well as the sex of the target group (LaGreca, 1981). Therefore, in addition to the overall ability to predict to the peer ratings, the predictive validity of teacher ratings and behavioural observation were evaluated with respect to each peer category as well as each sex separately.

A second, related question investigates the nature of the relationship among each of the three assessment sources taken two at a time. Greenwood et al (1977) consider this to be an important issue in screening/assessment research. They suggest that the covariation of these three measures in the description, identification, and assessment of childhood problems needs to be thoroughly investigated. This set of analyses describes the correlations among variables and factors that maximally contribute to the relationship between each of the assessment sources under study. Due to the highly related nature of these two research questions, the hypotheses pertaining to each are presented together and as one set of predictions. Since the nature of the present study is highly descriptive it was felt that strong hypotheses, empirically tested, were not warranted. Instead, the general trends that have been observed in the past literature were evaluated in terms of their consistency with the data reported here. Since the tapping of all three sources with respect to a single at-risk sample is rare in the literature, new relationships meriting further investigation were anticipated.

Hypotheses The first group of hypotheses to be focused on were those that concern differences in the ability of the teacher ratings and the behavioural observations to predict the peer ratings of the target

children. Due to the relative scarcity of research investigating the behavioural-peer relationship, it was difficult to empirically hypothesize which of the sources should show superior predictability. Theoretically, one might expect a stronger relationship between peer ratings and behavioural observation due to the milieu that serves as a primary reference for each. For instance, the fact that children have maximal opportunity to interact with peers during free-play (the focus of the behavioural observations in this study) suggests that it is within that environment that they might base the majority of their opinions of the children in their class. Teachers, on the other hand, would presumably form their opinions based on the children's behaviour within the classroom. As mentioned earlier, children's behaviour can change dramatically depending on whether an adult is present and whether they are in the classroom or on the playground (Hartup, 1979). These factors would be expected to maximize the correspondence between peer reports and behavioural observations and work against the teacher-peer relationship. However, Moskowitz and Schwarz (1982) have reported that very large samples of behaviour are required to capture the consistency of behavioural patterns such as dominance and dependency. Furthermore, they suggest that an observer who is counting specific behaviours (as in behavioural coding) must treat variation due to context as error while a knowledgeable informant (e.g. teacher or peer) can take the context of certain behaviours into consideration when forming opinions.

This latter point would suggest that teacher ratings may show a stronger relationship than behavioural observation to the peer ratings. Research investigating the teacher-peer relationship has typically indicated reasonable correspondence between these measures (Ledingham et

al., 1982; Pekarik et al., 1976). However, agreement between sources also appears to be a function of the type of behaviour being rated (Ledingham et al, 1982) as well as the sex of the target child (LaGreca, 1981). Kenrick and Stringfield (1980) found greater agreement for behaviours that are highly observable and Ledingham et al. (1982) similarly reported a stronger relationship among assessment sources for ratings of aggression over withdrawal or likability. Based on these studies further hypotheses, specific to certain behavioural dimensions and sexes, appeared warranted. Thus, it was hypothesized that there would be a stronger relationship between teacher and peer ratings of aggression than for withdrawal. This would be consistent with Winett and Winkler's (1972) suggestion that the prefered mode of behaviour in the classroom is "still and quiet", thus withdrawal going less noticed. Further, it was expected that there would be a sex difference in the relationship between teacher and peer ratings of withdrawal. Due to the effects of sex stereotyping in the environment, there may be a tendency for teachers to normalize, or fail to notice, the withdrawal dimension in females. Quiet, passive behaviour is typically viewed as more positive and appropriate in females by both children and adults (Hartley, 1960; Hetherington, 1974). Withdrawal in males, running contrary to societal expectations, would remain a salient behavioural problem for teachers, thus contributing to a sex diffence in the degree of teacher-peer relationship on this dimension.

Although there has been very little previous research investigating the peer rating-behaviour observation relationship, several hypotheses could be put forth based on the related literature. For example, Hymel and Asher (1977) have found that accepted and non-accepted children do

not differ in the amount of time spent interacting with peers, observing peers, or playing alone. Further, Asher, Markell, and Hymel (1981) criticize the use of a "rate of interaction" approach for identifying children as withdrawn and at-risk in their peer relations. They suggest that qualitative, rather than quantitative measures of children's interactions would be more sensitive in the identification of an at-risk child. Thus, due to the primarily quantitative nature of this study's coding system, it was hypothesized that peer-rated withdrawal would show a weaker relationship than aggression to the observational variables. In addition, in light of Maccoby and Jacklin's (1980) suggestion that some forms of aggression might be considered by peers to be appropriate for boys and not for girls, certain sex differences would be expected. Particularly, it was hypothesized that a weaker relationship between peer-rated aggression and the behavioural variables might exist for boys than for girls. That is, peers may not "notice " or utilize information on boys' aggression, which is the "norm", while observers do record it. Alternatively, the "norms" for aggressive playground behaviour in boys may be so high that peer-identified Aggressive boys do not stand out on the playground. In either case, there would be less agreement between observational and peer assessments of aggression in boys than in girls.

The final relationship to be focused on is the correspondence between teacher ratings and behavioural observation of the peer-identified target children. Very little is known about the free-play behavioural correlates of teacher assessments in an elementary school population (Hymel & Rubin, in press). Further, teacher ratings are presumably based on classroom behaviour due to the limited exposure that teachers have to the children outside of the classroom. Thus, it was

difficult to predict the type, or magnitude, of relationship that the two measures might display. Several studies (Factor & Frankie, 1980; Rubin, & Clark, 1983) have indicated what appear to be intuitively appropriate behavioural correlates of teacher rated social maladjustment, but in a preschool population. Given the elementary school sample (grade 4 and 5) in the present study it could only be suggested that, once again, a reasonably strong correspondence between teacher rated aggression and aggressive behaviour on the playground would be found. In addition, the previously hypothesized weak association between teacher-rated and peer-rated withdrawal would be expected to be equally evident in this relationship. Specifically, children whose behaviour stands out on the playground due to lack of activity and involvement were not expected to appear as extreme in the classroom due to the constraints placed upon the children in that setting.

Method

Identification of Sample

A French language elementary school in the Montreal Catholic School Commission agreed to participate in the study. The French language school was selected in order to remain consistent with the Concordia High Risk project (Schwartzman, Ledingham, & Serbin, in press) and thus permit generalization of this study's results to that project.

The school was located in a middle class, suburban residential area in the north-east sector of Montreal. During the 1982-83 school year five classes of each of grades 4 and 5 were studied. Consent was

obtained from the school board (CECM), the teachers, and the parents' committee at the school.

To select the four target groups (Aggressive, Withdrawn, Aggressive-Withdrawn, and Contrast) to be followed for observation, a French translation of the Pupil Evaluation Inventory (PEI) (Pekarik et al, 1976) was administered to all children present on the day of testing in each of the 10 classes.

The PEI (see Appendix A) consists of 35 items that might be described as brief statements of behavioural characteristics common to children. Each item loads onto one of three factors: Aggression (20 items, e.g. "those who are mean and cruel to other children"), Withdrawal (9 items, e.g. "those who are too shy to make friends easily"), and Likeability (5 items, e.g. "those whom everybody likes").

In each class the children were provided with a class list complete with identification numbers for each child. They were asked to nominate a maximum of four boys and four girls who best fit the description of each item on the questionnaire. All children participated in the procedure for same and opposite sex peers. Boys and girls were nominated separately in different administrations in order to control for sex differences in the base rates of the behaviours described, as well as possible same sex biases in the nomination procedure (Asher & Hymel, 1981).

The total number of nominations received by each child was calculated for items loading onto each of the three factors. These scores were subjected to a square root transformation to minimize the skew in distribution and then converted to z scores for each sex within each class, once again, to control for sex differences in base rates.

Target subjects were selected on the basis of their z scores on the aggression and withdrawal factors only. PEI likeability z scores, although not considered in the selection procedure, are presented in Table 1 (Appendix B). It should be noted that the criteria were adhered to as strictly as possible but were relaxed in several cases in order to increase the sample size as well as evenly distribute subjects across sex, grade, and class.

The majority of children selected to the Aggressive group (n=17) had z scores above +1.65 (95th percentile) on the aggression factor and below +.68 (75th percentile) on the withdrawal factor. In seven cases the cut-off for the aggression factor was relaxed to include subjects with aggression z scores below +1.65, the lowest being +1.26 (89th percentile).

The majority of the children selected to the Withdrawn group (n=16) had z scores above +1.65 on the withdrawal factor but below +.68 on the aggression factor. Again, seven subjects were selected to this group although not fully meeting the criterion on the withdrawal factor, the least deviant having a withdrawal z score of +1.26 (89th percentile).

Children were selected to the Aggressive-Withdrawn group (n=20) if their aggression and withdrawal z scores were above +.68. All children selected to this group met these criteria.

The final group of interest, the Contrast group (n=20), was selected from all those children with z scores falling between -.68 (25th percentile) and +.68 on both the aggression and withdrawal factors. An effort was made to select one or two such children from each class participating in the study. These children represent a group that is centered around the mean (i.e. z score = .00) on the dimensions

or factors of interest and does not include children with exceptionally low z scores on aggression and/or withdrawal. Those children were excluded as it was thought that they may merely represent a group that is unknown to their peers thus receiving very few nominations. Table 2 (Appendix B) reports the mean aggression and withdrawal z scores by PEI group and sex of the children selected as targets. Table 3 (Appendix B) outlines the distribution of the target subjects by grade, sex, and PEI classification. Subsequent statistical analyses involving the peer ratings have made use of either the nominal codes given the peer-identified categories or the actual z scores on the aggression and withdrawal dimensions.

Naturalistic Observation of Target Children

Photo session and child identification system After consulting with school authorities a complete set of photograghs were taken of all children in each of the 10 classes that had been administered the PEI (see Appendix C for full procedure). Children were photographed in groups of 2-4 with and without their winter clothing. These photos were then inserted in 8 1/2 x 11 inch transparent sheets and all children selected for observation were identified by a brown self-adhesive dot label containing the child's identification number. This reference was used daily by the filmers in order to identify the children to be videotaped as well as by coders to verify the target child on video segments where a crowded playground made identification difficult.

Videotaping of target subjects The target children were videotaped during the morning and afternoon recess sessions on the school playground. These sessions lasted from 12-15 minutes and were held daily weather permitting.

In order for the observers to remain unobtrusive in the filming procedure, videotaping was done from a second-story window that overlooked the entire playground. The colour video-cameras were equipped with telephoto lenses which were capable of producing clear images of even the furthest areas to be filmed. Although the filmers were visible, the children were not aware of the specific target children that were being filmed.

The filming procedure involved locating and identifying a target child from a photograph, and then filming that child for a two-minute sample before seeking another target. Filming crews consisted of two members; a spotter and a filmer. The role of the spotter was to locate a target child on the playground, describe that child to the filmer, and then time the filming segment for 2 minutes and 15 seconds once the filming had begun. The responsibility of the filmer was to follow the target child with the video-camera wherever he/she might move on the playground and report the disappearance of the target should the line of vision be obscured. While the filmer was filming the target the spotter's duty was to locate another target for filming. In addition, the spotter was required to call out the target subject's identification number as well as a description of his or her clothing. This description was simultaneously recorded on one of the two audio tracks of the videotape (see Appendix C for full description of procedure and equipment).

Once filmers had returned from the field they were required to review the footage that had been taken and enter appropriate documentation in a log book listing all segments that had been filmed to date. This log contained the date, film number, technicians' (filmers')

names, identification number of the child filmed, starting and ending footage, and duration of the segment. The log served as a master reference for all videotape used by the project.

Filming schedule Children were filmed on a rotating schedule to ensure an even sampling of each child's behaviour across time. Filmers accomplished this by generating a pool of subjects to be filmed before the actual session rather than just filming subjects as they became visible. Although the number of segments filmed tended to lag on certain "hard to find" subjects, this procedure was generally successful in maintaining the steady collection of data across subjects.

Target subjects were filmed during the fall and winter/spring terms of the 1982-83 school year. An average of 13.7 two -minute segments (SD=0.9) was collected for each child, thus an average of almost 28 minutes of data was collected for each subject. The number of segments per subject ranged from 12 (five subjects) to 16 (two subjects).

Observational code development and description Working with the videotapes from another school as pilot data in the present study, an observational coding system was developed to reflect the interactional behaviour of the target children and their peers.

The final version of the observational code examines not only the target child's rate and type of interaction with peers, but also any interaction that the peers might initiate towards the target. It is best described as consisting of three categories of behaviour each of which are broken down into smaller, observable units or variables. The first category involves the amount of time spent in social play as well as the sex and number of play partners. If the target child was not engaged in social play then his/her proximity to the other children was

coded, once again coding for number and sex of proximal peers. A second category of behaviour involved coding the occurrence of physical contact between the target child and peers, including the nature of the contact, as well as who initiated and who responded. The final category involved ratings, on a scale from 0 to 2 (i.e. 0=low, 1=medium, 2=high), of (1) the target child's level of involvement with peers, (2) the target's attempts to elicit peer attention, (3) the amount of attention given to the target by peers, and (4) the target's level of motor activity (see Appendix D for full Observational Code description).

Much of the rationale for the direction that this code has taken is derived from research involving approaches to the identification of children at risk in peer relations. Asher, Markell, and Hymel (1981) have suggested that efforts to identify such children should focus on both the quality of the child's interaction and whether the child is accepted by the peer group rather than focus on frequency or rate of interaction. The social play/proximity variables essentially tap this qualitative aspect of social interaction when analyzed in conjunction with the level of involvement ratings. Together these two sets of variables were to provide a sensitive measure of the nature, as well as intensity, of the child's interaction with peers on the playground, rather than only frequency of interaction.

The variables in the physical contact category were included after much study of the videotapes from another school. Intuitively they seemed to relate to aggression and withdrawal, the two global constructs of interest to the study. It was thought that these variables would differentiate children scoring high on each of these dimensions.

A set of variables that were deleted from the earliest version of

the code were the "approach" and "leave" variables, designed to measure the number of times that the target child moved to within, or from within, one meter of a peer. Not only did these variables prove to be too difficult to code for children on a crowded playground but also were incapable of discriminating between the target groups in pilot work. Due to the number of children and their activity level in the yard during the recess session these variables were not considered meaningful and were dropped from the code.

Adaptation of the code to the "More" microprocessors The "More" microprocessors used for data collection are essentially hand-held computers with both keys (numbered 0-9) and toggles (numbered 1-8) for data entry. Due to the complex nature of the observational code it was necessary to develop a hybrid coding scheme making use of both the keys and the toggles. Those variables that required a duration measure were entered on the toggles where the beginning and end of an event could be signaled by a "flick" of a switch. The variables that required a frequency measure were entered on the keys when the event to be recorded occurred.

As previously mentioned, variables in the code can be classified under three general headings, 1) social play/proximity, 2) physical contact, and 3) level of involvement and motor level. During a coding session each two-minute videotape segment was viewed four times. During the first pass of the segment the observer (coder) simply identified the target child and attempted to become familiar with the context of the child's behaviour on the playground. After the target child had been identified the videotape segment was viewed three more times in order to code each of the three general categories of variables. The social

play/proximity variables were coded during the second pass by switching "on" various combinations of the toggles. During the third pass, variables in the physical contact category were recorded by entering a two-digit code on the keyboard of the "More" unit. Ratings of the level of involvement and motor level variables were coded every seven seconds on a rotating basis during the fourth and final pass of the videotape (see Appendix E for complete description of the coding procedure).

Training of coding personnel This researcher, a doctoral student, and three undergraduate students, who were paid as research assistants, participated in intensive group training sessions from August through December of 1982. The initial stages of the training process involved coding on paper rather than on the "More" units in order to first become familiar with the proper application of the code. Variables in each of the first two categories were coded as either "observed" or "not observed" after each 10 seconds of a videotape segment. At the same time ratings of each of the level of involvement and the motor level variables were made on a high, medium, or low basis. Reliability was calculated as the number of agreements divided by the sum of agreements and disagreements between all combinations of pairs of coders. Within a few weeks of beginning training, observers reached a +.80 level of interobserver agreement across most categories coded.

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 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.

During the second phase of coder training the transition to coding on the "More" observational units was made. Coders were required to become very familiar with the two-digit codes and toggle combinations corresponding to each of the variables to be coded as well as develop a considerable amount of dexterity on the "More" keyboard and switches. Group training sessions continued to be held three to four times per week, again using pilot videotapes. Reliability was assessed periodically using a Pearson correlation coefficient and was calculated for each variable in the code and for all combinations of pairs of coders.

After reliability reached close to +.80 across most categories the training sessions were concluded. Coding of videotapes which were the focus of the present study was then initiated. It should be noted that certain categories remained consistently below the desired +.80 reliability level. 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.

Further, in order to maintain high interobserver agreement throughout the study, agreement on the coding of each segment was monitored. A weekly check of the intercoder reliability and group meetings helped prevent coder "drift", and when a gross discrepancy was noted between the two coders on a particular segment, that data was discarded and the segment recoded by both coders. Final interobserver agreement was assessed across all 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 behavioural 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 4 (Appendix B) underestimate the actual reliability of the data as it was finally analyzed.

Preparation of data for statistical analyses After coders had completed a session of coding (usually two hours of work) data was transferred to an audio cassette for storage, only later to be loaded onto 5 1/4 inch floppy disks on a Northstar Advantage microcomputer. A set of programs designed to facilitate data management and prepare the raw data for analysis was developed by a computer programmer who was familiar with the project. The first step in this preparation was the merging of the three separate passes for each segment resulting from the coding of the three general categories of variables. Next, the

frequency or duration (depending on which variable) for all variables was calculated and summary tables generated for each possible event in the observational code. A summary table was generated for both codings of a particular segment as well as for each and every segment that was filmed on each child. Finally, the multiple summary tables were aggregated to produce a single set of data (i.e. one frequency or duration measure for each dependent variable) for each child observed. This was accomplished by taking the mean of all segments for a target child for each dependent variabbe. Only at this point was the data transferred to the University's CYBER computer for statistical analysis.

Subsequent statistical analyses made use of dependent variables from each of the three coding passes of the videotaped segments. In addition, various transformations of the simple dependent variables were performed in order to reduce their numbers as well as create more meaningful measures. For example, 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 these variables in the first pass were measured for duration. Within each two-minute sample, these durations were converted to percentages and the following combined variables were computed:

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 relative to total frequency of aggression by target, (2) frequency of punches relative to total frequency of target aggression, (3) frequency of aggression other than slaps and punches relative to total frequency of target aggression, (4) frequency of peer retaliations relative to frequency of aggression incited by the target subject, (5) frequency of target retaliations relative to frequency of aggression incited by peers, and (6) frequency of aggression incited by

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

Teacher Reports of Target Children

The Teacher's Report Form (TRF) of the Child Behavior Checklist (Edelbrock & Achenbach, 1984) was chosen for administration to the teachers of the target children who had been selected for observation. The TRF (see Appendix F) portrays adaptive functioning and problem behaviours and is designed to obtain ratings on many of the same problem behaviours that parents rate on the Child Behavior Checklist (Achenbach, 1978), omitting Checklist items that teachers would not ordinarily be in a position to rate.

Adaptive functioning is scored on scales for performance in academic subjects, how hard the child is working, how appropriately he/she is behaving, how much the child is learning, and how happy the child seems to be. The behaviour problems section consists of 113 brief descriptions of problem behaviours that are scored on scales derived

from factor analyses of teachers' ratings of children referred for special help with behavioural and/or emotional problems. The eight first order factors for boys include those indicative of anxious behaviour, social withdrawal, unpopularity with peers, self destructive behaviour, obsessions and compulsions, inattentiveness, nervous or overactive behaviour, and aggression. For girls these factors are identical except for the substitution of a depression factor for the obsessive-compulsive factor on the boys scale. Two second order factors have also been derived and represent two broad-band groupings which have been labeled Internalizing and Externalizing.

All teachers agreed to complete the form for the target children in their classes and were paid according to the number of forms that they would have to complete (i.e. the number of children in their class that had been selected as targets for the study).

The form was translated into French by two Francophone research assistants during January of 1983. In February, 1983 the procedure for completion of the TRF was presented to the teachers by a research assistant who was familiar with the TRF and capable of answering procedural and theoretical questions concerning the form. At this session the teachers were administered the forms and were asked to complete them in the following four to six weeks. Upon completion they were returned by hand and in a sealed envelope to ensure confidentiality.

Scoring of the Teacher Report Forms The author of the TRF has constructed scoring profiles (see Appendix G for copy of boys' profile) for Teacher Report Forms completed for boys and girls aged 6-11 years. The profile includes standard and T scores based on normative samples

for teachers' ratings of academic performance, four general adaptive characteristics previously described, the eight behaviour problem scales, the two broad-band scales labeled internalizing and externalizing, and a total behaviour problem score.

Programming personnel at the Centre for Research in Human Development at Concordia University developed a computer program that greatly facilitated the scoring of each individual form and produced a convenient print-out of T and raw scores. The present study made use of the T scores on the eight first-order factors and the two second-order factors in the statistical analyses.

Results

The first set of analyses provided a description of each peer-identified target group from the point of view of the other measures. It was felt that knowledge of the specific differences between the four peer-identified groups on both the teacher ratings and the behavioural variables would provide a context within which the remaining analyses (those related to the study's hypotheses) would be more meaningful. Group differences were examined using one-way (PEI group) analyses of variance for both the boys and girls separately. The decision to run the sexes separately was based on pilot work that revealed large differences in base rates for observational and teacher variables as well as the fact that there are different scoring profiles for boys and girls on the the Teacher Report Form.

Tukey's honestly significant difference post hoc test was used to examine differences between pairs of groups following the finding of a

significant main effect for PEI group classification. A .05 alpha level was used as the criterion for significance in both the ANOVAs and the post hoc comparisons. It was not the purpose of this group of analyses to report all variables that showed significant group differences as many are redundant. Further, in some cases, variables that were only marginally significant (i.e. $p<.10$) are reported. The intention was to provide a picture of each peer-identified group from the perspective of each assessment source. As a reference, the means and standard deviations for each variable are presented for each of the four target groups and each sex in Tables 5 to 12 (see Appendix B for all statistical tables).

Differences on the Observational Variables

Girls Within the observational variables for the girls a large number of variables showed significant PEI group differences. One such variable was the amount of time that target girls spent proximal to only one other girl, $F(3,30)=4.60$, $p<.01$. Post hoc comparisons revealed significant differences between all groups with Contrast girls spending 15.3% of their time proximal to a single same-sex peer, the Aggressive-withdrawn group spending 12%, the Withdrawn group 9.8% and, the Aggressive group spending only 5.9%. Significant group differences were also found for the gender composition of the child's peer group. Aggressive girls spent significantly more time in a mixed-sex peer group (66.9%) than either the Contrast or the Withdrawn girls (24.6% and 41.4% respectively), $F(3,30)=10.09$, $p<.001$. The complementary variable, same-sex peer group, obviously also showed group differences, $F(3,30)=10.37$, $p<.001$. Post hoc comparisons of group means showed Contrast girls to be spending more time with same-sex peers (63.8%) than either the

Aggressive-withdrawn (40.5%) or the Aggressive (22.8%) groups.

Examination of the physical contact variables also revealed a number of interesting group differences, all in the direction that would be intuitively expected. For instance, a marginally significant difference between groups was found in the amount of touching that target girls initiated, $F(3,30)=2.88$, $p<.10$. The tendency here was for Aggressive girls to initiate touches more frequently (1.49) than the Withdrawn girls (.91), while the other two groups were intermediate (values are in frequencies per minute). On the variables designated as aggression, there was strong indication that the Aggressive girls not only doled out, but also received significantly more of this type of physical contact (see observational code, Appendix D, for examples). Significant group differences were found in the total amount of aggression initiated ($F(3,30)=3.07$, $p<.05$) as well as retaliated ($F(3,30)=3.88$, $p<.05$) by the target children with the Aggressive girls outdistancing the Withdrawn and Contrast groups on both of these measures. The Aggressive group was also the focus of more peer retaliatory aggression (.24) than either the Withdrawn or Contrast groups (.07 and .06 respectively), $F(3,30)=3.80$, $p<.05$.

Finally, among the level of involvement and motor level variables there were several results worthy of mention. There was a tendency for Withdrawn girls to attempt to elicit peer's attention less (.56) than the other groups (range from .64 to .68), $F(3,30)=2.78$, $p<.10$. It was also noted that the Aggressive girls tended to be more physically active than the others, $F(3,30)=2.70$, $p<.10$. In addition, there were significant group differences in the amount of attention that peers gave to girls in each of the target groups, $F(3,30)=3.68$, $p<.05$. Post hoc

comparisons revealed that the Contrast girls received more peer attention (.43) than the Withdrawn girls (.29).

Boys The analyses on the boys' observational data provided very few significant results in contrast to those previously reported for the girls. For example, none of the play/proximity nor the physical contact variables showed significant group differences. In fact, within these two categories only two variables, both closely related, showed even a tendency toward a significant group main effect. These were the ratios of peer incited to target incited aggression ($F(3,35)=2.79$, $p<.10$) and total peer to total target aggression ($F(3,35)=2.77$, $p<.10$). The trends were identical for each of these variables and indicated that the Aggressive-withdrawn boys received the highest ratio of peer aggression to target aggression whereas the Aggressive boys received the lowest ratio. In light of this result, it is also interesting to note that peers rated the Aggressive-withdrawn boys as less likeable (mean $z=-1.12$ on the PEI likeability scale) than both the Contrast (.48) and the Aggressive (.05) boys, $F(3,35)=5.84$, $p<.01$.

Among the level of involvement and motor level variables only the amount of attention that the target child attempted to elicit showed significant group differences, $F(3,35)=3.50$, $p<.05$. Post hoc comparisons revealed that the Withdrawn boys made significantly less effort to elicit attention (.59) than the Aggressive boys (.70). The Aggressive-withdrawn and Contrast groups were similar to the Aggressive group on this measure (.67 and .69 respectively).

Differences on the Teacher Rating Variables

Although the behaviourally coded variables appeared to discriminate the peer-identified groups for girls and not for the boys, the picture

was somewhat reversed for the variables derived from the teacher reports of the target children. It should be noted that the values reported in this section are the T-scores on each of the eight first-order and two second-order factors of the Teacher Report Form. These scores can range from 55 to 100 for the first-order factors on both the boys' and the girls' profiles. They can range from 42 to 100 for the second-order "internalizing" scale for both boys and girls, while ranging from 39 to 100 and from 43 to 100 for the boys' and girls' "externalizing" scales respectively.

Girls. Of the 10 variables derived from the teacher ratings, only four showed significant group differences for the peer-identified girls. Significant group differences were found on teacher rated unpopularity, $F(3,30)=5.22$, $p<.01$, with post hoc comparisons revealing that the Aggressive (65.7) and Aggressive-withdrawn (65.8) girls were rated more unpopular than girls in the Withdrawn group (57.7). The nervous-overactive factor was also significant, $F(3,30)=3.25$, $p<.05$, and showed the same relationship among groups (W=55.9 versus A=60.9, AW=60.6) as the unpopularity factor. Teacher rated aggression showed significant differences among the groups, $F(3,30)=6.98$, $p<.01$. The Aggressive children were rated more deviant on this factor (64.3) than both the Withdrawn (55.4) and Contrast (56.6) children, while the Aggressive-withdrawn group (62.4) was rated higher only than the Withdrawn group. The final significant variable was the second-order externalizing factor, $F(3,30)=6.80$, $p<.01$. Tukey post hoc comparisons revealed that girls in the Aggressive (60.9) and Aggressive-withdrawn (60.5) groups were rated as being more deviant on this measure than either the Contrast (50.6) or Withdrawn (48.9) girls. By comparison,

the second-order internalizing factor showed no significant group differences, $F(3,30)=0.57$, n.s. In fact, the teacher rated withdrawal variable was the only factor to highlight the Withdrawn children and did so only marginally, $F(3,30)=2.43$, $p<.10$.

Boys In contrast to the results for girls, all 10 factors in the teacher's reports for boys showed significant group differences. Both the teacher rated anxiety factor ($F(3,35)=5.28$, $p<.01$) and the withdrawal factor ($F(3,35)=3.70$, $p<.05$) showed significant differences between the Withdrawn group and the Contrast group (Withdrawn group rated more deviant). Further, the second-order internalizing factor showed both the Withdrawn (63.6) and the Aggressive-withdrawn (62.9) groups as significantly more deviant than the Contrast group (49.6), $F(3,35)=8.64$, $p<.001$. This is in direct contrast to the lack of significant results for girls on the equivalent factors of the female profile.

In addition, several factors differentiated the Aggressive and the Aggressive-withdrawn groups. The teacher rated unpopularity factor revealed a significant difference between the Aggressive-withdrawn group (72.4) and the Withdrawn (59.7) and Contrast (57.1) groups, $F(3,35)=9.99$, $p<.001$. Similarly, the self-destructive ($F(3,35)=3.55$, $p<.05$), obsessive-compulsive ($F(3,35)=3.58$, $p<.05$), and inattentive ($F(3,35)=9.93$, $p<.001$) factors set apart the Aggressive-withdrawn group from various combinations of the other three peer-identified groups. The factor labeled nervous-overactive showed the Aggressive children (66.8) to be significantly more deviant on that dimension than either the Withdrawn (57.0) or Contrast (56.8) children, $F(3,35)=5.44$, $p<.01$. Finally, the teacher rated aggression ($F(3,35)=12.89$, $p<.001$) and

externalizing factors ($F(3,35)=11.07$, $p<.001$) both served to significantly differentiate the children in the Aggressive and Aggressive-withdrawn groups from the other target children.

The previously described analyses of variance have demonstrated several interesting characteristics of the data set. Rather than review these, it is sufficient to state that, hopefully, they have provided a context within which the remainder of the analyses can be evaluated. Several of the trends presented thus far are addressed in a more efficient manner in the subsequent discriminant function and canonical correlation analyses. These analyses provide a vehicle for elaborating upon the degree and type of relationships among the three assessment sources considered here. Since they are both multivariate techniques they permit the consideration of several (or many) factors or variables at the same time allowing for more complex solutions than is possible with a univariate technique such as analysis of variance.

Discriminant function analyses were used to evaluate the ability of both the teacher and observational variables to predict the peer-identified classifications. Canonical correlations served to describe in detail the strongest relationships that exist between assessment sources taken two at a time. Due to the large number of variables generated by the teacher rating and observational procedures, it was necessary to establish some criteria according to which variables could be selected for inclusion in the analyses. Many variables within a particular assessment source were highly intercorrelated or were interdependent by virtue of the way they had been mathematically derived. Thus, certain variables could be immediately rejected due to their redundancy with existing ones. Among the remaining variables a

combination of reduction criteria were used. These included:

1. the Pearson correlation between variables in the two sets being examined,

2. the ability of a variable to significantly discriminate between the peer-identified groups as well as visual inspection of the means for each group (used for the teacher-peer and the observational-peer comparisons),

3. the use of multiple regression of one set of variables onto each variable in a second set to determine their predictive potential.

These procedures typically led to the inclusion of more variables than was statistically desirable. Therefore, further reduction criteria were used after having run discriminant and canonical analyses on the larger sets of variables. For example, within the stepwise discriminant function only those predictor variables that contributed to a significant change in Rao's V were retained for the final analysis. For the canonical analyses, however, the criteria were less objective and included an inspection of 1) the standardized coefficients of the canonical variates for each set of original variables, and 2) the correlation of the original variables with the canonical variables.

The presentation of this section will be organized according to the three relationships that have been investigated. Within the presentation of each relationship, analyses have been broken down by sex in order to contrast, what appear to be, two very distinct data sets.

Relationship Between Observational Data and Peer Ratings

Discriminant function - Girls A discriminant function analysis initially included 14 observational variables in predicting the four

peer-identified groups of children. It was found that no significant improvement in the differentiation among groups (as measured by a significant change in Rao's V) occurred after the fourth step of the analysis (Table 13). Classification results were therefore examined using only the first four variables as predictors. In descending order of their predictive power, the four variables used were, 1) total time spent with opposite sex peers (including a mixed sex group), 2) total peer and target initiated touch, 3) amount of attention target attempts to elicit from peers, and 4) total time spent in group same-sex play. Group means for these variables appear in Table 14.

These variables yielded only one significant discriminant function (the maximum possible is three in this case), accounting for 82% of the explained variance ($p<.001$). This function served to differentiate the Aggressive from the Contrast girls, leaving the Aggressive-withdrawn and Withdrawn girls in an intermediate position. The second discriminant function, by comparison, only accounted for 15% of the explained variance and, due to its nonsignificance, does not merit interpretation. The discriminant function coefficients and group centroids for the first two functions are presented in Tables 15 and 16.

Using the four variables as predictors, the function was able to place 70.6% of the target girls into their correct peer-identified group (Table 17), a rate that far exceeds chance levels. When this correct classification percentage was broken down by PEI group it revealed a variable correct prediction rate across categories. For example, the analysis was able to correctly classify 85.7% of Aggressive and 90% of Contrast girls. By comparison, only 42.9% of Withdrawn and 60% of Aggressive-withdrawn girls were placed correctly. In each case, the

incorrect classifications were distributed across the remaining groups rather than falling predominantly into one particular category. Further, analyses indicated that the discriminant function was unable to significantly differentiate between the Aggressive-withdrawn and the Withdrawn groups nor the Aggressive-withdrawn and the Aggressive groups. However, significant differentiation existed for all pairings that included the Contrast group.

Discriminant function - Boys The equivalent analysis for the boys' data initially included 15 variables that were thought to be potentially good predictors of the peer-identified categories. Similar to the girls' data, no significant improvement in the differentiation among groups occurred after only the third step of the analysis (Table 18). In descending order of their predictive power, the variables that were retained in the analysis were, 1) the amount of attention that the target attempts to elicit from peers, 2) the total amount of target aggression in retaliation, and 3) the ratio of peer incited aggression to target incited aggression. The group means for each of these variables appear in Table 19.

These variables yielded one significant ($p \leq .01$) and one marginally significant ($p < .10$) discriminant function accounting for 71.2% and 26.7% of the explained variance respectively. The first of these functions served to differentiate the Withdrawn group from all other groups. Examination of the discriminant function coefficients (Table 20) indicates that the "elicits attention" variable loaded most highly on this function, while the group means on that variable clearly show the Withdrawn group as standing apart (lower) from the others. The second function, accounting for far less variance, tends to differentiate the

Aggressive-withdrawn boys from all other groups. The group centroids for the first two functions are presented in Table 21.

Using the three variables as predictors, the analysis was able to place 53.8% of the target boys into their correct peer-identified groups (Table 22). The analysis was able to correctly classify 80% of the Aggressive boys, a rate comparable to that for the girls (85.7%); and 66.7% of Withdrawn boys (girls' rate was 42.9%). The two remaining peer-identified categories showed poor correct placement rates of 40% for the Aggressive-withdrawn group and 30% for the Contrast group (girls' rates were 60% and 90% respectively). These latter rates are hardly better than chance and are possibly explained by the weaker criteria for selection to these groups as well as the lack of variability in the boys' playground behaviour (suggested by the scarcity of significant group differences in the observational data). Both of these points are discussed later.

Although misclassifications of the Contrast boys were spread across all other groups, there was a tendency for Aggressive-withdrawn boys to be misclassified as Aggressive, essentially missing the withdrawn dimension. A total of 40% of the Aggressive-withdrawn group were misclassified in this direction.

In summary, the analyses for the boys' and girls' data indicate that only a small number of observational variables are necessary to predict peer-identified categories at rates well above chance. Although the girls' playground behaviour predicted peer ratings more accurately than did the boys' behaviour, it is the group by group comparisons that are most interesting and merit further attention later. Both of these relationships are now further elaborated upon within canonical

correlation analyses of the two data sets.

Canonical correlation - Girls. A canonical correlation analysis was performed between the three PEI z scores (aggression, withdrawal, likeability) and a subset of the observational variables that were selected according to previously described criteria. Although the initial analysis included 13 observational variables, this number was reduced to provide a more parsimonious and interpretable solution. The observational variables that were included in the final canonical correlation were, 1) group same-sex play, 2) time spent alone, 3) total peer and target initiated touch, 4) total aggression by target, 5) amount of attention that target attempts to elicit from peers, 6) amount of attention peers give to target, 7) total time spent with opposite sex peers (including a mixed group), and 8) the ratio of target retaliated to peer incited aggression. It should be noted that assumptions regarding within-set multicollinearity were met.

As a reference, the correlations among the variables are presented in Table 23 with significance at the .01 and .05 levels indicated. Table 24 includes the latent roots, the corresponding canonical correlations, and their associated tests of significance. Bartlett's test (making use of the chi-square statistic) was used to determine the number of canonical variables necessary to express the relationship between the two sets. A significant solution was indicated with all three canonical correlations included ($p<.001$) as well as with the first canonical correlation removed ($p<.05$). Subsequent tests were not significant, therefore the first two canonical correlations account for the significant relationships between the two sets of variables. The first significant canonical correlation was .79 (62% of variance) and

the second was .73 (53% of variance). These relatively high canonical correlations suggest that the canonical variates accurately describe the relationship between the two sets of variables (Darlington, Weinberg, & Walberg, 1973).

Analyses of the two pairs of canonical variates that accompany the first two canonical correlations appear in Table 25. Shown in the table are correlations between the variables and the canonical variates as well as the standardized canonical variate coefficients.

With a cut-off correlation of .30 for interpretation, the variables relevant to the first canonical variate in the peer rating set were, in order of magnitude, 1) likeability, and 2) withdrawal. Among the observational variables, 1) target and peer initiated touch, 2) attention target attempts to elicit, and 3) attention that peers give to target, were relevant to the canonical variate. Taken as a pair, the first canonical variates indicate that those girls rated as likeable by their peers (.76) and rated low on withdrawal (-.6[illegible]) tend to be involved in more non-aggressive touching on the playground, and tend to elicit (.46) and receive (.40) more attention from their peers.

The second canonical variate in the peer rating set was composed of the aggression measure alone, while the corresponding variate from the observational set included 1) time spent with opposite sex peers (including mixed-sex group), 2) group same-sex play, 3) ratio of target retaliated to peer incited aggression, 4) total aggression by target, and 5) attention target attempts to elicit. Taken as a pair these variates suggest that girls rated as aggressive by their peers (.99) tend to spend more time in a mixed-sex group (.74) and play less frequently with a group of same-sex peers (-.57). They also have a high

rate of retaliation to peer incited aggression (.55) and aggression in general (.52), and tend to attempt to elicit more attention from peers.

Canonical correlation - Boys The initial canonical correlation for the boys included the three PEI z scores and 13 observational variables. The number of observational variables in the canonical analysis was reduced to the eight that are reported here. The observational variables that were included in the final analysis were, 1) play with a single same-sex peer, 2) time spent alone, 3) total peer and target initiated touch, 4) total aggression by target, 5) attention target attempts to elicit from peers, 6) attention peers give to target, 7) target activity level, and 8) ratio of peer incited to target incited aggression.

Correlations among variables are presented in Table 26. Table 27 includes the latent roots, the corresponding canonical correlations, and the associated tests of significance. Only the first canonical correlation of .81 was significant ($p<.01$) accounting for 67 % of the variance between the two sets. Once again, the relatively high correlation suggests that the canonical variates accurately represent the relationship between the two sets.

The analysis of the pair of canonical variates that accompany the first canonical correlation appears in Table 28. Again using a cut-off correlation of .30 for interpretation it is observed that all the peer rating measures and all but one of the observational variables (play with a same-sex peer) merit inclusion. One variable, "total aggression by target", was marginal but is included in the interpretation. It should be noted that this pair of variates is somewhat more difficult to describe due to the fact that both peer-rated aggression and withdrawal

show strong correlations with the canonical variate (positive and negative respectively). Taken together these variates indicate that boys rated by peers as high on aggression (.67) and low on withdrawal (-.70) tend to elicit (.69) and receive (.53) more attention from peers and are generally highly active (.49). This pattern also appears to be associated with more non-aggressive (.51) and aggressive (.28) physical contact and a low ratio of peer to target incited aggression (-.47). They also have a tendency to spend less time alone (-.43) and are generally considered likeable by peers (.39).

In summary, it is noted that both the aggression and withdrawal z scores play a significant role in the canonical relationships between PEI and observational variables for both boys and girls. Although the associated patterns of behaviour may vary across sexes, there appears to be certain observable social behaviours associated with each of these broad patterns of peer-identified deviance.

Relationship Between Teacher Ratings and Peer Ratings

As previously mentioned, the Teacher Report Form (TRF) of the Child Behaviour Checklist (Edelbrock & Achenbach, 1984) was used to investigate the relationship between teacher ratings and peer ratings of the four groups of target children. The TRF generates eight first-order and two second-order factors. Only the first-order factors have been used to investigate this particular relationship. Since the second-order factors are essentially only a summation of several first-order factors it was decided that they would be redundant in the present set of analyses.

Discriminant function - Girls A discriminant function analysis initially included all eight first-order factors in evaluating the

ability of the TRF to predict the four peer-identified groups of children. These variables were labeled 1) anxiety, 2) withdrawal, 3) unpopularity, 4) depression, 5) self-destructive, 6) inattentive, 7) nervous-overactive, and 8) aggression. It was found that no significant improvement in the differentiation among groups occurred after only the second step of the analysis (Table 29). Classification results were therefore examined using only the first two variables as predictors. In order of their predictive power, the two variables used were the factors labeled 1) aggression, and 2) withdrawal. Group means for these variables appear in Table 30.

These variables yielded two significant discriminant functions, the first ($p<.001$) accounting for 77.9% of the explained variance, and the second ($p<.05$) accounting for 21.1%. The first of these functions served to differentiate the Aggressive girls from the Withdrawn and Contrast girls, leaving the Aggressive-withdrawn group in an intermediate position. The second function served to differentiate the Aggressive-withdrawn group from the Contrast and Aggressive groups, leaving the Withdrawn group as intermediate. The discriminant function coefficients and group centroids are presented in Tables 31 and 32. The centroids indicate the relative close proximity of the Withdrawn and Contrast groups relative to the other groups.

Using the two variables as predictors, the classification results indicate that the function was able to place 61.8% of the target girls into their correct peer-identified group (Table 33). When broken down by group, the correct classification rate was 85.7% for the Aggressive group and 70% for the Contrast group. By comparison, only 57.1% of Withdrawn and 40% of Aggressive-withdrawn girls were placed correctly.

Especially interesting is the distribution of incorrect classifications into the other groups. For the Withdrawn group all misclassified girls were predicted to the Contrast group. Within the peer-identified Aggressive-withdrawn group there was a tendency toward misclassification as Aggressive or as Contrast. In fact, in only one case (of six) was an Aggressive-withdrawn girl misclassified as Withdrawn.

Discriminant function - Boys The equivalent analysis for the boys data again included only the first-order factors in an initial discriminant function. First-order factors on the boys' profile are identical to those for the girls' except that "obsessive-compulsive" is substituted for the "depression" factor. It was found that no significant improvement in the differentiation among groups occurred after the fourth step of the analysis (Table 34). Classification results were therefore examined using only these first four variables as predictors, in contrast to the two significant predictors for the girls' data. In descending order of their predictive power, the four variables used were the factors labeled 1) aggression, 2) inattentive, 3) withdrawal, and 4) obsessive-compulsive. The group means for these variables appear in Table 35.

All three discriminant functions yielded by these variables were significant although the third accounted for only a small percentage of the variance. The first function ($p<.001$) accounted for 59.9% of the explained variance while the second ($p<.001$) and third ($p<.05$) functions accounted for 32.1% and 8% of the variance respectively. The first function served to differentiate the Withdrawn group from the Aggressive and Aggressive-withdrawn groups, leaving the Contrast group in an intermediate position. The second function served to differentiate the

Aggressive-withdrawn from the Aggressive and Contrast groups with the Withdrawn group occupying a central position. The third function was not interpreted due to the small amount of variance that it accounts for. The discriminant function coefficients and group centroids are presented in Tables 36 and 37. In contrast to the equivalent analysis for the girls, the centroids indicate considerable differentiation of the Contrast and Withdrawn groups for the boys.

Using the four teacher variables as predictors, the function was able to place 71.8% (girls' rate was 61.8%) of the target boys into their correct peer-identified groups (Table 38). This rate was 70 % for the Aggressive group (girls' rate - 85.7%), 60% for the Aggressive-withdrawn group (girls' rate - 40%), and 80% for the Contrast group (girls' rate - 70%). Most noteworthy was the high rate of correct prediction, 77.8%, for the Withdrawn boys relative to the previously reported rate of 57.1% for Withdrawn girls.

In summary, although a higher percentage of boys were correctly classified into their peer-identified group than girls, once again the most interesting results lay in the group by group comparisons (e.g. prediction rate for Withdrawn girls vs Withdrawn boys). Canonical correlation analyses of the two sets of variables were performed in order to further elaborate on these observations.

In order to elucidate the nature of the peer-teacher relationship, two separate canonical analyses between the two data sets were performed for both the boys and the girls. The first analysis examined the relationship of a subset of the TRF first-order factors to the PEI $\underline{z}$ scores. Because the TRF has an unequal number of factors indicative of aggressive and withdrawn patterns of behaviour it was decided to run a

second analysis involving only the TRF second-order factors (internalizing and externalizing). Apart from being more easily interpreted, it was felt that the pairing of these broad band factors with the peer ratings might provide a less biased picture of the peer-teacher relationship.

Canonical correlation - Girls The first analysis was performed between the three PEI z scores and a subset of the TRF factors that were selected according to previously described criteria. The TRF factors that were included in this first analysis were , 1) anxiety, 2) withdrawal, 3) depression, 4) unpopularity, 5) inattentive, 6) nervous-overactive, and 7) aggression.

Correlations among the variables are presented in Table 39. Table 40 includes the latent roots, the corresponding canonical correlations, and the associated significance tests. Only the first canonical correlation of .76 was significant ($p<.02$) and accounted for 58% of the variance between the two sets.

The analysis of the pair of canonical variates that accompany the first canonical correlation appears in Table 41. Using a cut-off of .30 for interpretation it was found that all measures except for the teacher-rated withdrawal factor merit inclusion. Taken together these variates indicate that girls rated by their peers as high on aggression (.93), low on withdrawal (-.34), and less likeable (-.39) also tend to be rated by teachers as very unpopular (.74), nervous and overactive (.75), aggressive (.88), and depressed (.50). Teachers also rate such girls as somewhat inattentive (.32) and less anxious than peers (-.30), although these latter correlations are of a lesser magnitude. It should also be noted that peer-rated withdrawal in this canonical analysis

carries considerably less weight and correlates lower than peer-rated aggression, thus its importance in the solution is questionable.

The second analysis for the girls was performed between the PEI z scores and the second-order teacher-rated internalizing and externalizing scales. Correlations among the variables are presented in Table 42. Table 43 includes the latent roots, the corresponding canonical correlations, and the tests of significance. Again only the first canonical correlation of .85 was significant ($p<.001$) and accounted for 73% of the variance between the two sets of variables.

Analysis of the pair of canonical variates that accompany the significant canonical correlation appear in Table 44. Shown in the table are correlations between the variables and the canonical variates as well as the standardized canonical variate coefficients. The variables relevant to the first canonical variate in the peer rating set were, in order of magnitude, 1) aggression, and 2) likeability. Peer-rated withdrawal did not merit inclusion due to a low correlation and relatively low coefficient. Among the second-order teacher factors, only the externalizing factor was relevant to the canonical variate. Taken as a pair, the canonical variates indicate that girls who are rated by peers as high on aggression (.88) and low on likeability (-.71) also tend to be rated by teachers as high on the externalizing factor (.94). It should be noted that the second canonical correlation, highlighting the PEI withdrawal scale and the TRF internalizing factor, was not significant (canonical correlation of .30, 9% of variance).

Canonical correlation - Boys A similar pair of canonical analyses were run for the boys. Within the first analysis, in addition to the three PEI z scores, the TRF factors that were included were, 1)

withdrawal, 2) aggression, 3) obsessive-compulsive, 4) unpopularity, and 5) inattentive.

Correlations among the variables are presented in Table 45. Table 46 includes the latent roots, the corresponding canonical correlations, and tests of significance. The first ($p<.001$) and the second ($p<.02$) canonical correlations were significant. The first was .84 and the second was .59 accounting for 71% and 35% of the variance between their respective sets of variables.

Analyses of the two pairs of canonical variates that accompany the two significant canonical correlations appear in Table 47. Taken as a pair, the first pair of canonical variates indicate that boys who are rated by peers as high on aggression (.95) and low on withdrawal (-.49) also tend to be rated by teachers as aggressive (.84), unpopular (.50), and somewhat inattentive (.47) as well as obsessive-compulsive (.41). This peer-rated pattern is also associated, to a lesser degree, with lower levels of teacher rated withdrawal (-.29).

The second significant pair of variates suggest that boys rated by peers as highly withdrawn (.87), rather aggressive (.31), and who are generally considered less likeable (-.54) also tend to be rated by teachers as more withdrawn (.73) and inattentive (.66) as well as less popular than the other children (.81). This pattern is also associated with moderate levels of teacher-rated aggression (.42) and obsessive-compulsive behaviours (.37) although these correlations are weak in comparison to the others.

A shift in focus to the TRF second-order factors again indicated the need for two canonical correlations to account for the relationship between the two sets of variables. The first of these canonical

correlation was .77 ($p<.001$) and the second was .61 ($p<.001$) accounting for 59% and 37 % of the variance respectively (Table 48). The correlations between variables are presented in Table 49.

Analyses of the two pairs of variates that accompany the significant canonical correlations appear in Table 50. The first pair of variates indicate that boys who are rated by peers as high on aggression (.94), but low on withdrawal (-.43) and less likeable (-.41) also tend to be rated by teachers as high on the externalizing factor (.87).

The second pair of variates suggest that boys who are rated by peers as withdrawn (.90) and as less likeable (-.68) tend to be rated by teachers as high on the internalizing factor (.99) as well as moderately high on the externalizing factor (.49). However, the canonical variate coefficients indicate that the withdrawal and internalizing factors are easily the primary variables within this set of variates.

The most interesting finding here is that the canonical relationship for the girls relied primarily on the peer-rated aggression and teacher-rated externalizing factors to the neglect of the withdrawal and internalizing dimensions. By comparison, the equivalent analyses for the boys were able to incorporate both major dimensions within each set of variables. This appears to be consistent with the associated discriminant function analyses where the peer-identified Withdrawn boys were more effectively differentiated from the other groups than the peer-identified Withdrawn girls.

Relationship Between Observational Data and Teacher Ratings

The final set of analyses focuses on the relationship between teacher ratings and behavioural observations of the peer-identified

target children. It might be argued that this analysis has been confounded by the fact that extreme scores on an independent measure (peer ratings) were used to select the target subjects. That is, the use of extreme groups could only serve to spuriously inflate the degree of relationship found between the two assessment sources. However, due to the scarcity of such research in the literature and the descriptive nature of this study, it was decided to proceed with the analyses just the same.

Only canonical correlations have been reported here since discriminant function analyses require the existence of classification groups. Further, an attempt was made to use only the second-order TRF factors, rather than the eight first-order factors, in order to limit the number of variables in the solution. Preliminary analyses indicated that this relationship was less meaningful when the first-order TRF factors were included.

Canonical Correlation - Girls A canonical correlation analysis was performed between the two TRF second-order factors (internalizing, externalizing) and a subset of the most predictive observational variables. The observational variables that were included in this analysis were 1) time spent alone, 2) the ratio of opposite-sex to same-sex play, 3) time spent proximal to a single peer, 4) total peer and target-initiated touch, 5) total target aggression, and 6) amount of attention target attempts to elicit from peers.

Correlations among the variables are presented in Table 51. Table 52 includes the latent roots, the corresponding canonical correlations, and the associated significance tests. The first canonical correlation of .69 was significant ($p<.01$) accounting for 48% of the variance

between the two sets. The second canonical correlation of .55 was only marginally significant ($p<.10$), however it was interpreted for descriptive purposes.

The analysis of the pair of canonical variates that accompany the first two significant canonical correlations appear in Table 53. Using a cut-off of .30 for interpretation, it was found that all observational measures and teacher factors merited inclusion in the interpretation of the first pair of variates. Taken together these variates indicate that girls rated by teachers as high on the TRF externalizing factor (.68) and low on the internalizing factor (-.43) also tend to try to elicit more attention from peers (.76), spend very little time alone (-.64) or with a single peer (-.41), and frequently play with the opposite sex (.64). This pattern also appears to be associated with high levels of both aggressive (.59) and non-aggressive (.34) physical contact.

Once again using a .30 cut-off it was found that both of the teacher factors and three observational measures merited inclusion in the interpretation of the second pair of variates. These variates suggest that girls rated high by teachers on both the internalizing (.91) and externalizing (.73) factors tend to play frequently with the opposite sex (.46) and spend time with only a single peer (.50). In addition, this teacher-identified pattern (possibly analogous to the peer-identified Aggressive-withdrawn group) is also associated with high levels of target aggression (.57).

Canonical correlation - Boys The equivalent analysis for the boys was performed on the two TRF second-order factors and a subset of observational variables including 1) time spent alone, 2) frequency of slaps initiated by the target, 3) total target aggression, 4) amount of

attention target gives to peers, 5) amount of attention peers give to target, and 6) the targets' activity level. In contrast to the results for the girls, this combination of variables failed to generate a single significant, or marginally significant, canonical correlation.

In response to this failure, it was decided to choose several representatives of the internalizing and externalizing factors from among the first-order factors. The combination that proved most effective in describing a meaningful relationship between the two data sets included the factors labeled 1) anxiety, and 2) aggression. Correlations between these two variables and the observational subset are presented in Table 54. Table 55 includes the latent roots, the corresponding canonical correlations, and the associated tests of significance. The first canonical correlation of .59 was significant ($p<.05$) accounting for 35% of the variance between the two sets. The second canonical correlation of .53, as in the analysis for the girls, was only marginally significant ($p<.10$) accounting for only 28% of the variance between the sets of variables. Both pairs of variates will be interpreted.

The analyses of the two pairs of canonical variates that accompany the first two canonical correlations appear in Table 56. Using a .30 cut-off, it was found that only the teacher rated aggression factor and the observational variable measuring frequency of incited slaps merited inclusion in the interpretation of the first pair of variates. Together they suggest that those boys rated high on the TRF aggression factor tend to frequently use slapping as a form of aggression. Taking into account the very low frequency of slapping on the playground, this is not a very meaningful finding.

The interpretation of the second marginally significant canonical correlation, although accounting for less variance, incorporates four of six observational variables as well as both of the teacher factors. This pair of variates suggests that boys who are rated by teachers as high on anxiety (.99) and low on aggression (-.30) tend to give less attention to peers (-.61) and receive less in return (-.63). They also show a tendency to spend time alone (.32) and exhibit a low level of activity on the playground (-.41).

In summary, canonical correlations investigating the relationship between teacher ratings and observations of playground behaviour tend to account for less between-sets variance than the two previously reported relationships. This may be due to the milieu that is relevant to each of these assessment techniques or perhaps systematic biases inherent in the methods themselves.

Sex differences in the relationship between the teacher factors and observational variables are somewhat consistent with those reported for the teacher-peer rating relationship. For example, the first canonical correlation for the females relied primarily on the teacher-rated externalizing factor, while the second highlighted both the externalizing and internalizing factors in describing what appears to be the teacher-rated equivalent of the peer-identified Aggressive-withdrawn group. Thus, this analysis failed to singularly highlight the internalizing or withdrawn dimensions.

The first canonical correlation for the boys also focused on teacher-rated aggression although it relied on only a single, rare, observational variable. However, in contrast to the analysis for the girls, the second canonical correlation focused almost exclusively on

the teacher-rated anxiety factor which loads onto the second-order internalizing factor.

Discussion

A combination of analyses of variance, and both discriminant function and canonical correlation analyses were successfully used to investigate a number of hypotheses related to the nature of the relationship among three assessment sources. Although in many cases the results of the analyses suggest confirmation of the study's predictions, the reader is warned to proceed with caution when generalizing from these results. Not only are they based on a small sample (at a single school), but are also the product of statistical analyses that have been employed descriptively, rather than to empirically test experimental hypotheses. As mentioned earlier, the aim of this study was to evaluate the general trends that have been previously reported in the literature in terms of their consistency with the present data set. The importance of this undertaking is evident in light of the scarcity of studies contrasting all three assessment sources with respect to an elementary-school sample.

Prior to analyses investigating the relationship between assessment sources, analyses of variance were employed to provide a picture of where PEI-group differences lay with respect to the teacher ratings and behavioural observations.

Among the observational variables there were a greater number of measures significantly discriminating the girls' peer-identified groups than the boys' groups. Inspection of group means suggested that there

rs more variability (in terms of the observationally coded variables) in the playground behaviour of girls in contrast to the generally higher level of activity and physical contact seen for the boys (Lyons, 1984).

This trend was somewhat reversed with respect to teacher ratings on the Teacher Report Form. All 10 teacher factors significantly discriminated the boys' peer-identified groups, while only four teacher factors showed significant group differences for the girls. Further, both the internalizing and externalizing dimensions (and related first-order factors were highlighted among the measures showing a PEI-group main effect for the boys. By comparison, only the externalizing dimension, and several related factors, served to differentiate the girls' groups. These interesting characteristics of the two data sets, when supported by further analyses, hold important implications for clinical work and research involving screening instruments. Further elaboration of these, and other, relationships were investigated through discriminant function and canonical correlation analyses of variables from each assessment source.

A first major focus of this study was to evaluate the ability of teacher ratings and observations of playground behaviour to correctly predict peer-identified groups. Since peers are generally considered to be the best predictors of later maladjustment, it is important to determine the adequacy of teacher reports and behavioural observations as alternatives to assessments by peers. That is, will teacher reports and behavioural observations identify the same children as being at-risk as do peer ratings? Although not empirically assessed, there was no clear cut superiority observed in either the teacher or behavioural variables' ability to predict prior PEI-groups. Correct classification

rates ranged from 53% to 71% which are at least 100% better than what would have been expected by chance alone. The failure to find superiority in one instrument over another stems from the fact that, for the males, predictability was higher within the peer-teacher relationship than the peer-observational pairing, while just the opposite was true for the girls. This is not surprising in light of the results of the previous analyses of variance. Essentially, data sets showing higher variability among PEI groups also showed better prediction to those groups.

In order to investigate the factors contributing to this informal sex by instrument interaction in predictability, it was decided to examine the ability of each assessment source to predict each of the PEI groups separately.

Within the analyses investigating the peer-observational relationship, the peer-identified Aggressive group was the most accurately predicted by the observational variables for both boys and girls (80% and 85.7% respectively). The peer-identified Withdrawn girls, by comparison, were not nearly as well predicted (42.9%) and even the Withdrawn boys showed some decline in correct classification rate (66.7%). This difference in ability to predict is probably best explained by Kenrick and Stringfield's (1980) finding of greater agreement for behaviours that are highly observable, rather than by a systematic bias in the relationship between the two assessment sources. That is, the differences in prediction for aggression and withdrawal are probably due to an overall emphasis on aggression/activity (thus less emphasis on withdrawal) in the behavioural code and perhaps even the PEI. Further, the fact that misclassifications of Withdrawn children

were distributed across all other groups, rather than predominantly one group, would argue against the systematic bias explanation. These relationships are further supported in the canonical correlation analyses for boys and girls. Canonical correlations for each sex separately highlighted both major behavioural dimensions (i.e. aggression and withdrawal) in explaining the relationship between the two data sets, although withdrawal was always negatively weighted. Variables included in the interpretations were all in the direction that would be intuitively expected. They included a relationship between peer-rated aggression and withdrawal and levels of time spent alone, non-aggressive touching, and the amount of attention that the target elicits and receives from peers on the playground.

The last finding that was of interest within this relationship concerned the ability of the observational variables to predict the peer-identified Contrast group. The Contrast girls were correctly predicted at a 90% rate in comparison to 30% correct placement for the boys. Once again, inspection of the group means suggests that lesser variability among PEI groups in the playground behaviour of boys contributed to this inability to distinguish the Contrast boys from the other groups.

Of special interest was the relationship between teacher ratings and peer ratings. Due to the extensive reliance on teacher referrals, it is important to know the degree to which they are in accordance with peer ratings of children exhibiting problems (LaGreca, 1981).

Group by group comparisons of the predictive ability of teacher ratings again indicated a high level of correct placement for the peer-identified Aggressive boys and girls (70% and 85.7% respectively) which

is consistent with Ledingham et al.'s (1982) finding of greater agreement between assessment sources for aggression over withdrawal. It seems that teachers have no problem correctly identifying the children that peers have identified as aggressive. However, the more interesting finding is related to the ability of the teacher ratings to correctly predict the peer-identified Withdrawn children. This rate was 77.8% for the boys which represents even greater predictability than was observed for the observational data. By comparison, teacher ratings could only correctly predict 57.1% of the Withdrawn girls. Although still well above chance levels, the weakness in this relationship is reflected by the fact that all misclassifications of Withdrawn girls were into the Contrast group, suggesting a systematic bias on the part of the teacher ratings. That is, teacher ratings of peer-identified Withdrawn girls tended not to reflect the peer-rated deviant aspect of their behaviour.

Further support for this possible sex difference in the way teachers perceive withdrawal is provided by the canonical correlation analyses. For the girls, neither the inclusion of the eight first-order nor the second-order teacher factors was able to generate a canonical correlation highlighting the withdrawn/internalizing dimension. Aggression and externalizing factors, on the other hand, were clearly featured in both analyses. By comparison, the equivalent analyses for the boys produced two significant canonical correlations for each set of teacher variables used. In each case they featured both major dimensions (aggression-externalizing and withdrawal-internalizing) and neatly described the relationship between the two data sets in terms of both. Rather than immediately discuss the implications of these results, the discussion will now turn to the final relationship that was

investigated.

Studies investigating the relationship between teacher ratings and behavioural observation of playground behavior are rare in the literature (Hymel & Rubin, in press). Further, those that have been reported are typically dealing with a preschool population (eg. Factor & Frankie, 1980). Results of those studies probably should not be generalized to an elementary school population for several reasons. First, the playground behaviour of preschool children is closely supervised and therefore certain behaviours that might occur during elementary school free-play are inhibited in a preschool group. Second, due to this constant out-of-class supervision, the degree of relationship between preschool teacher ratings and playground behaviour would likely be somewhat inflated over that which would be expected in an elementary school. Thus, for many of the same reasons that the teacher-peer relationship is important, the behavioural correlates of teacher reports is an important research focus.

Canonical correlations were performed between the observational and teacher variables for boys and girls separately. The results suggest that this relationship is weaker (i.e. the canonical correlations were lower) than the two previously discussed relationships, namely, the teacher-peer and observational-peer pairings. Intuitively this was predicted due to the different milieus serving as a primary reference for each of these assessment sources. Empirically, it follows from Hartup's (1979) report that a child's behaviour can change dramatically depending on whether an adult is present and whether they are in the classroom or on the playground.

Turning to the composition of the canonical variates for each sex,

the relationships between data sets were found to be consistent with the previous analyses involving these assessment sources. The canonical correlations for the girls featured primarily an aggressive-externalizing dimension and alternately an externalizing-internalizing dimension. That is, consistent with previous analyses, canonical correlations involving the teacher ratings of girls failed to produce an exclusively internalizing or withdrawn dimension. By comparison, the equivalent analysis for the boys featured both an externalizing dimension and an internalizing dimension in separate correlations. In fact, surprisingly, the canonical correlation featuring the teacher internalizing factor incorporated more observational variables in its interpretation than that which featured the teacher externalizing factor.

The results that have been summarized tend to be consistent with a number of the study's hypotheses. However, in several cases hypotheses were clearly not supported by the data. What sort of explanation, then, can be provided for the differential rates of predictability and association that were seen across instrument, sex, and behavioural dimension?

Initially it was difficult to predict which of the measures (teacher or observational) would most accurately predict the peer-identified classifications. There appeared to be arguments favoring both alternatives to peer ratings including Hymel and Rubin's (in press) conceptualization of behavioural observation as the "acid test" and Moskowitz and Schwarz's (1982) support of the "knowledgeable informant". However results failed to show a clear cut superiority of either instrument, due to what might be called a sex by instrument interaction

in ability to predict. In fact, there appeared to be a direct relationship between the degree to which variables from an assessment source significantly discriminated the PEI groups (based on the analyses of variance) and prediction on the discriminant function. This is by no means a revelation, however, since it is precisely upon this factor that a discriminant function analysis depends. That is, the more variability that is found between groups, the easier it will be to significantly discriminate (predict) those groups with a discriminant function. In terms of the present study, variability on the peer rating measure was not a problem due to the manner in which these scores were calculated and the target groups selected. But what is it that contributes to variability on the dimensions within the other assessment sources?

Looking first at the analysis evaluating the observational-peer relationship, it was observed that there were more significant group differences in the observational variables for girls than there were for boys. It can probably be said that variability in playground behaviour relies least on intervening factors. That is, playground behaviour can be taken as face valid, and, thus, it appears that girls exhibit a wider range of behaviours during free-play than boys. Whereas the girls' data showed group differences on play/proximity, physical contact, and level of involvement measures, the high activity level in the boys seemed to blurr group distinctions on all of these. Mainly contributing to this difference in play styles was the type of games that each sex engaged in. Boys played dodge ball almost exclusively while girls tended to divide their time between dodge ball and an elastic jumping game. Further, due to the impersonal nature of a dodge ball game it is likely that even the most withdrawn boy could become involved without putting

too much strain on his social skills, and perhaps even become involved in a little "jostling". Thus, although it is believed that data from behavioural observations can be taken as face valid, it is not sufficient to do so. Several factors affect the type of behaviours that can be observed on a playground and these should be taken into account when evaluating results.

Another prediction that was made within this relationship was that the association between data sets would be greater for the aggression dimension than for the withdrawal dimension. This was supported in the results and is consistent with Kenrick and Stringfield's (1980) finding that agreement between sources is typically greater for highly observable behaviours. However, this may simply be a product of a greater sensitivity of both the observational code and the PEI for aggression over withdrawal. For instance, of the 35 PEI items almost twice as many load onto the aggression factor as load onto the withdrawal factor. In terms of the behavioural code, there are fewer variables that are positively weighted for withdrawal (i.e. high levels indicative of withdrawal) than for aggression. Taken together, the greater number of variables indicative of the aggressive dimension on both instruments would suggest that agreement would be superior for that dimension (e.g. the effects of one or two deviant variables would be less deleterious to the strength of the relationship).

A final prediction that was made anticipated a weaker relationship on the aggression dimension for boys than for girls. It was thought that peers might normalize aggression for boys thus leading to poor variability on that dimension in the peer ratings. In other words, the boys would all look very much the same on the PEI aggression scale. In

fact it was the behavioural variables that showed this. Aggressive and non-aggressive physical contact levels were very high for most PEI groups, suggesting poor variability on the aggression/activity dimension of the observational measures. By comparison, variability was maintained within the peer-rating set due to the statistical procedures used to derive these scores (i.e. conversion to z scores). As a result, the aggression dimension was adequately represented for both girls and boys.

The study's second, perhaps most interesting, focus investigated the degree of relationship between teacher and peer ratings of the target sample. The results indicated that, whereas the two data sets show a strong relationship for the aggression or externalizing dimension for both sexes, as well as the withdrawal dimension for boys, it is less than adequate for the withdrawal or internalizing dimension for girls. Once again assuming adequate variability and representation of both major dimensions within the peer ratings, the onus for the explanation of the observed pattern of results falls on the teacher ratings. In contrast to the observational variables, there are several factors affecting the degree to which teachers reliably report these dimensions.

A first major factor, in explanation of the stronger relationship for aggression, is related to the type of behaviour that is considered appropriate within the classroom. Winett and Winkler (1972) have reported that today's schools appear to be preoccupied with order and tranquility in the classroom. This fact suggests that teachers would be much more likely to single out the aggressive or disruptive child in the class before the withdrawn child since aggression runs counter to the preferred mode of behaviour.

A second issue concerns the type of behaviours that teachers consider appropriate for each sex, and serves to explain the sex difference in the strength of relationship for withdrawal. Although not generalized to all teachers or adults, there is considerable evidence suggesting that the majority of adults view aggression, independence, competence, and dominance as characteristic of males, and affection, nurturance, and passivity as characteristics of females (Hetherington, 1974). Further, research has shown that a particular behaviour is most salient when it deviates considerably from the stereotype. Together, these facts would suggest that the deviant behaviours most reliably noted by teachers would be the aggressive patterns in girls and the withdrawn patterns in boys since these behavioural styles run contrary to the stereotype. The fact that the discriminant function analysis incorrectly classified more than 40% of the peer-identified Withdrawn girls as Contrast suggests that there is a tendency to miss withdrawal in girls due to its consistency with the stereotype. Withdrawn boys, by comparison, were correctly classified on the basis of teacher reports in 77% of instances, a rate which exceeds even the correct classification rate for the Aggressive group.

The final comparison made was the teacher-observational relationship which generated results that were consistent with the two previous relationships. Aggression was, again, the dimension of primary importance in this relationship. That is, children who tend to be among the more active and aggressive on the playground also tend to be those identified as aggressive or externalizing by teachers. Withdrawal on the other hand, as in the other analyses involving the teacher ratings, showed a stronger relationship between data sets for boys than for

girls. Boys who have a tendency toward passivity on the playground are adequately identified by teachers. However, girls who demonstrate a withdrawn behavioural style out of class are not as reliably rated as such by the teacher. These results are efficiently explained by the previously described principles and therefore are not elaborated upon here.

In summary, the relationship between assessment sources, for a given behavioural dimension, relies extensively on each source's ability to reliably report that dimension. The ability to reliably report a dimension, in turn, appears to be dictated by at least three major factors.

A first factor involves the degree to which the behaviour deviates from the actual norm within the milieu. For example, since "passivity and quiet" are considered to be the classroom norm, the chances of a withdrawn child appearing deviant in that milieu are less than they would be for an aggressive or disruptive child. Put another way, the withdrawn child's deviant behaviour is part of a behavioural dimension that has little chance of appearing variable within the classroom due to the situational constraints. In other words, the extremely withdrawn child will not look all that different from the slightly withdrawn child. To generalize, weaknesses in a relationship between assessment sources would occur when either one or the other, or both, are insensitive to a particular behavioural dimension due to invariability of that dimension within the reference milieu.

A second relevant factor, related to the first, involves the degree to which the behaviour deviates from the expected (stereotypic) behaviour for the reference group. This factor suggests that

behaviours, whether deviant or not, that run grossly contrary to the stereotype are more likely to be noticed than those that are consonant. For example, in the present study, teachers more reliably reported peer-rated withdrawal for boys than for girls, possibly due to the "passive" female stereotype.

A final factor is related to the sensitivity of the assessment instrument to the behavioural dimension of interest. For instance, even though an instrument may generate scores on factors X, Y, and Z, it does not necessarily mean that each factor carries equal weight or emphasis, nor equal stability, in the total score. An example of this can be found in each of the assessment instruments used in the present study. The PEI aggression scale is composed of at least twice as many items as either the withdrawal or likeability scales. The TRF obsessive-compulsive factor contains far fewer items than its aggression counterpart. Further, it is felt that even the behavioural code emphasizes aggression and activity over behaviours that are indicative of withdrawal (e.g. solitary play). It is, therefore, important to take this factor into account when evaluating an assessment instrument's ability to reliably report a dimension.

One additional consideration, unrelated to the reliability of reporting a dimension, pertains to the milieu serving as the primary reference for an assessment. It should be intuitively obvious that this factor must be taken into account when evaluating the relationship between two instruments. In the present study, for example, the teacher-observational canonical correlation was substantially lower than those observed in the other relationships. This was probably partly due to the fact that teachers would, presumably, be rating a child on the

behaviour that he or she exhibits in the classroom. The behavioural observations, on the other hand, are a reflection of the child's playground behaviour. Peers, of course, observe in both settings. It is likely that behaviour in these two environments can range from very similar to very different depending on the individual child. And perhaps it is the ability to "modulate" ones behaviour which marks the Contrast child in this study.

The results of the present study have several implications for not only the clinical assessment and screening of at-risk children, but also research into the etiology of childhood psychopathology. Above all, they indicate that ratings by teachers and peers, and behavioural observations are, in many ways, closely related in the assessment of an at-risk population. The fact that there were not any conflicting or counterintuitive results generated in the comparison of these instruments suggests that each is a valid assessment source capable of tapping major dimensions of childhood deviance.

However, the covariation observed among assessment sources implies that there are important differences in their ability to reliably report certain behavioural dimensions for each sex. In some cases the covariation was due to the different milieus serving as a reference to each source, while in others, it was a result of biases inherent in the rater or the rating instrument. Whichever the case, each of the issues that have been raised should be carefully considered when selecting an assessment procedure for a particular population.

For example, implications to clinical assessment would suggest that, as an adjunct to peer assessment, the classroom is the ideal environment for identifying maladjusted boys. Both externalizing and

internalizing patterns of behaviour seem to stand out in that setting. Thus, the classroom teacher might serve as a valuable primary or secondary source of information. Conversely, for girls it would appear that the playground, and thus behavioural observation, would be the best assessment direction to take. That is, assessments of free-play behaviour seem to more effectively differentiate aggressive and withdrawn patterns of behaviour in girls than do teacher ratings. Further, there is research suggesting that boys are more prone to respond to stressful situations (e.g. parental divorce) with less control (e.g. acting out), while girls are most likely to express overcontrolled (e.g. withdrawn) patterns (Emery, 1982, cited in Hetherington, 1984). Taken together with the fact that female withdrawal is best predicted by observational variables, and male aggression by teachers, this would support the previous suggestion of assessing males in the classroom and females on the playground. In fact, studies reporting female "invulnerability" to divorce may be focusing on an inappropriate source. That is, the deleterious effects may be there but are simply not picked up in assessments by teachers.

Implications for research into the etiology of childhood psychopathology are clear. They suggest that the various sources presently used to assess high-risk children are by no means redundant, and in fact quite complementary. All three sources of information are probably essential to a comprehensive understanding of aggressive-externalizing and withdrawn-internalizing patterns of behaviour in childhood. Further, if obliged to choose among assessment procedures, decisions should take into account the differential reliability of instruments across behavioural dimensions and sexes.

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Appendix A

Pupil Evaluation Inventory
(Pekarik et al., 1976)

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

Note - The column at the right that indicates the factor each item belongs to was not included in the version of this form administered to the children.

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

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

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

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

Appendix B

Statistical Tables

Table 1

Average PEI Likability Scores

(and Standard Deviations) for Each Peer-identified Group

Group	Sex			
	Males		Females	
	Z	Percentile	Z	Percentile
A	0.05 (0.74)	52	-0.41 (0.57)	34
W	-0.02 (0.79)	51	-0.24 (0.96)	41
AW	-1.12 (0.46)	13	-0.53 (0.96)	30
C	0.48 (1.33)	68	0.28 (1.09)	61

Table 2

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

Group	Sex			
	Males		Females	
	Z	Percentile	Z	Percentile
Aggression Scale				
A	1.68 (0.27)	95	2.01 (0.45)	98
W	-0.89 (0.30)	19	-0.33 (0.64)	37
AW	1.40 (0.49)	92	1.99 (0.49)	98
C	-0.32 (0.31)	37	-0.23 (0.23)	41
Withdrawal Scale				
A	-0.13 (0.54)	45	-0.41 (0.53)	34
W	2.03 (0.55)	98	1.69 (0.63)	95
AW	1.59 (0.68)	94	1.67 (0.40)	95
C	-0.26 (0.28)	40	-0.06 (0.34)	48

Table 3

Distribution of Target Subjects By Grade, Sex, and Peer Classification

	A	W	AW	C
Boys = 39				
Grade 4	4	4	6	5
Grade 5	6	5	4	5
Girls = 34				
Grade 4	5	3	5	5
Grade 5	2	4	5	5
Total	17	16	20	20

Table 4

Pearson Product-moment Correlation Coefficients Measuring Interobserver Agreement

Play and Proximity Variables:	
Play	.79
Group	.82
Same sex	.63
Opposite sex	.45
Mixed	.68
Dyad	.74
Same sex	.77
Opposite sex	.66
Proximity	.85
Group	.81
Same sex	.79
Opposite sex	.30
Mixed	.16
Dyad	.78
Same sex	.79
Opposite sex	.65
Alone	.83
With same sex (in play or proximity)	.51
With opposite sex (in play or proximity)	.54

Physical Contact Variables	
Touch	.39
Target	.58
Peer	.63
Aggression	
Target total	.79
Incited	.73
Retaliated	.83
Punch	.47
Incited	.50
Retaliated	.82
Slap	.35
Incited	.36
Retaliated	.00
Other	.79
Incited	.79
Retaliated	.79
Peer aggression	.85
Incited	.81
Retaliated	.75

Level of Involvement and Activity Level	
Target gave	.71
Target elicits	.70
Peer gave	.71
Target activity	.75

Table 5

Means (and Standard Deviations) by Peer Group of Social Play and Proximity Variables for Girls

	Group			
	A	W	AW	C
Play	66.8 (10.7)	56.9 (22.1)	56.1 (13.7)	56.4 (11.2)
with same-sex group	8.1 (7.9)	17.1 (14.9)	14.1 (9.6)	32.8 (16.3)
with opposite-sex group	3.2 (3.6)	0.9 (1.1)	1.8 (2.1)	0.3 (0.6)
with mixed-sex group	50.8 (16.0)	35.3 (22.0)	37.0 (15.6)	18.8 (11.7)
with same-sex peer	3.2 (2.7)	3.2 (4.8)	2.4 (2.2)	4.3 (3.6)
with opposite-sex peer	1.5 (2.4)	0.3 (0.4)	0.7 (0.8)	0.2 (0.2)
Proximal (but not playing)	22.9 (11.1)	28.0 (14.2)	31.6 (13.0)	32.0 (10.9)
to same-sex group	5.6 (3.9)	13.4 (8.6)	11.9 (10.2)	11.4 (6.5)
to opposite-sex group	4.2 (4.4)	1.8 (1.5)	2.1 (1.9)	2.2 (3.3)
to mixed-sex group	4.8 (4.8)	1.7 (1.7)	3.4 (2.2)	1.5 (2.0)
to same-sex peer	5.9 (3.2)	9.8 (5.8)	12.09 (6.1)	15.3 (5.1)
to opposite-sex peer	2.4 (2.1)	1.3 (1.3)	2.3 (2.2)	1.6 (1.8)
Alone	8.6 (4.1)	14.9 (12.4)	10.7 (5.8)	10.0 (5.2)

(Table 5, continued)

Total time with a group (across play and proximity)	76.7 (6.7)	70.2 (17.8)	70.3 (12.2)	67.0 (9.5)
Total time with a single peer (across play and proximity)	13.0 (6.3)	14.7 (6.6)	17.4 (7.7)	21.3 (7.1)
Total time with opposite-sex peers (including mixed-sex)	66.9 (14.3)	41.4 (20.0)	47.2 (15.4)	24.6 (13.9)
Total time with same-sex peers	22.8 (12.8)	43.5 (17.6)	40.5 (15.5)	63.8 (14.7)
Total time in play with a peer	4.6 (4.1)	3.6 (4.8)	3.1 (2.3)	4.5 (3.7)
Total time proximal (no play) to a peer	8.3 (4.1)	11.1 (6.0)	14.3 (6.7)	16.9 (5.4)
Total time in play with a group	62.2 (12.2)	53.3 (20.2)	53.0 (13.6)	51.9 (12.5)
Total time proximal (no play) to a group	14.6 (9.4)	16.9 (9.3)	17.3 (10.8)	15.1 (8.4)
Ratio of opposite/ same-sex play	.497 (.518)	.051 (.039)	.181 (.193)	.013 (.013)
Ratio of opposite/ same-sex proximity to peers	.843 (.763)	.183 (.150)	.291 (.282)	.149 (.182)

Note. Means represent percentage of time spent in each activity except for last two which are the ratio of the first variable to the second variable.

Table 6

Means (and Standard Deviations) by Peer Group of Social Play and Proximity Variables for Boys

	Group			
	A	W	AW	C
Play	62.5 (16.9)	54.9 (20.3)	63.8 (15.8)	66.7 (9.2)
with same-sex group	20.0 (13.1)	14.0 (12.1)	19.6 (13.7)	22.7 (12.3)
with opposite-sex group	0.9 (1.4)	2.2 (2.9)	1.6 (2.4)	6.1 (11.5)
with mixed-sex group	38.6 (16.0)	35.2 (23.4)	38.7 (16.3)	33.9 (9.1)
with same-sex peer	2.7 (2.6)	3.3 (2.6)	2.8 (1.9)	3.0 (2.6)
with opposite-sex peer	0.4 (0.5)	0.2 (0.2)	0.9 (1.3)	1.1 (1.9)
Proximal (but not playing)	22.7 (16.3)	23.3 (17.9)	24.6 (16.0)	20.1 (7.4)
to same-sex group	7.5 (5.7)	7.5 (9.9)	8.5 (7.4)	7.7 (4.9)
to opposite-sex group	1.5 (1.6)	2.2 (2.5)	2.2 (2.9)	1.3 (1.1)
to mixed-sex group	3.4 (4.3)	3.4 (4.2)	3.1 (4.1)	1.9 (1.1)
to same-sex peer	9.1 (7.9)	7.5 (3.9)	8.8 (6.9)	7.2 (4.8)
to opposite-sex peer	1.2 (1.8)	2.6 (3.7)	2.0 (2.4)	2.1 (2.7)
Alone	12.2 (4.1)	18.6 (14.4)	10.6 (4.9)	11.3 (4.3)

(Table 6, continued)

Total time with a group (across play and proximity)	71.8 (12.6)	64.6 (16.1)	73.7 (12.5)	73.4 (8.4)
Total time with a single peer (across play and proximity)	13.4 (10.4)	13.5 (6.3)	14.5 (9.6)	13.4 (5.6)
Total time with opposite-sex peers (including mixed-sex)	46.0 (17.0)	45.8 (22.7)	48.5 (17.3)	46.3 (11.6)
Total time with same-sex peers	39.2 (14.7)	32.3 (19.0)	39.8 (14.0)	40.6 (13.5)
Total time in play with a peer	3.0 (2.7)	3.5 (2.6)	3.7 (2.1)	4.1 (2.7)
Total time proximal (no play) to a peer	10.3 (8.2)	10.1 (4.7)	10.8 (8.1)	9.3 (5.6)
Total time in play with a group	59.4 (18.7)	51.3 (21.3)	60.0 (17.1)	62.6 (9.1)
Total time proximal (no play) to a group	12.4 (9.9)	13.2 (14.4)	13.8 (12.0)	10.8 (5.4)
Ratio of opposite/ same-sex play	.083 (.110)	.254 (.285)	.265 (.437)	.673 (1.428)
Ratio of opposite/ same-sex proximity to peers	.174 (.150)	.500 (.823)	.293 (.222)	.279 (.309)

Note. Means represent percentage of time spent in each activity except for last two which are the ratio of the first variable to the second variable.

Table 7

Means (and Standard Deviations) by Peer Group of Physical Contact Variables for Girls

	Group			
	A	W	AW	C
Total nonaggressive touch	2.565 (0.461)	1.808 (0.684)	2.135 (0.610)	2.302 (0.801)
total by target	1.499 (0.285)	0.911 (0.397)	1.192 (0.398)	1.281 (0.409)
total by peer	1.067 (0.232)	0.897 (0.318)	0.944 (0.262)	1.021 (0.427)
Total target aggression	0.852 (0.451)	0.361 (0.269)	0.517 (0.360)	0.343 (0.206)
incited	0.617 (0.286)	0.287 (0.203)	0.403 (0.293)	0.291 (0.162)
retaliated	0.234 (0.182)	0.074 (0.076)	0.114 (0.121)	0.051 (0.051)
Target punches	0.000 (0.000)	0.003 (0.007)	0.002 (0.005)	0.001 (0.004)
incited	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.001 (0.004)
retaliated	0.000 (0.000)	0.003 (0.007)	0.002 (0.005)	0.000 (0.000)
Target slaps	0.049 (0.037)	0.018 (0.025)	0.014 (0.020)	0.018 (0.030)
incited	0.044 (0.039)	0.015 (0.021)	0.012 (0.019)	0.016 (0.029)
retaliated	0.005 (0.009)	0.003 (0.007)	0.002 (0.005)	0.002 (0.005)

(Table 7, cont.)

	Group			
	A	W	AW	C
Target other aggression	0.803 (0.445)	0.341 (0.249)	0.501 (0.350)	0.324 (0.206)
incited	0.574 (0.286)	0.272 (0.184)	0.390 (0.285)	0.274 (0.162)
retaliated	0.229 (0.178)	0.069 (0.076)	0.111 (0.113)	0.050 (0.051)
Total peer agression	0.674 (0.379)	0.340 (0.253)	0.455 (0.357)	0.339 (0.277)
incited	0.433 (0.218)	0.267 (0.202)	0.341 (0.261)	0.279 (0.243)
retaliated	0.241 (0.196)	0.073 (0.059)	0.114 (0.120)	0.059 (0.054)

Note. The above means represent frequencies per minute.

Aggression Ratios

Peer retaliated/ target incited	0.353 (0.190)	0.252 (0.187)	0.351 (0.307)	0.211 (0.131)
Target retaliated/ peer incited	0.522 (0.361)	0.252 (0.234)	0.348 (0.233)	0.190 (0.106)
Peer incited/ target incited	0.811 (0.569)	0.925 (0.319)	1.001 (0.594)	1.004 (0.772)
Peer total/target total aggression	0.851 (0.376)	0.946 (0.310)	0.936 (0.431)	1.014 (0.588)

Note. Mean aggression ratios represent frequency of first variable per minute divided by frequency of second variable per minute.

Table 8

Means (and Standard Deviations) by Peer Group of Physical Contact Variables for Boys

	Group			
	A	W	AW	C
Total nonaggressive touch	3.051 (1.275)	2.180 (0.887)	2.508 (0.750)	2.260 (0.754)
total by target	1.717 (0.739)	1.212 (0.530)	1.314 (0.436)	1.162 (0.413)
total by peer	1.334 (0.634)	0.968 (0.407)	1.193 (0.425)	1.098 (0.454)
Total target aggression	1.090 (0.482)	0.942 (0.633)	0.894 (0.523)	1.140 (0.927)
incited	0.909 (0.400)	0.695 (0.452)	0.715 (0.428)	0.892 (0.716)
retaliated	0.181 (0.101)	0.247 (0.203)	0.179 (0.136)	0.248 (0.240)
Target punches	0.053 (0.053)	0.028 (0.020)	0.012 (0.016)	0.027 (0.072)
incited	0.040 (0.045)	0.020 (0.020)	0.010 (0.015)	0.020 (0.051)
retaliated	0.013 (0.017)	0.000 (0.000)	0.002 (0.005)	0.007 (0.021)
Target slaps	0.048 (0.058)	0.037 (0.016)	0.028 (0.047)	0.032 (0.031)
incited	0.043 (0.052)	0.032 (0.014)	0.027 (0.042)	0.027 (0.024)
retaliated	0.005 (0.012)	0.005 (0.008)	0.002 (0.005)	0.005 (0.011)

(Table 8, cont.)

	Group			
	A	W	AW	C
Target other aggression	0.988 (0.442)	0.877 (0.621)	0.854 (0.485)	1.080 (0.879)
incited	0.826 (0.361)	0.635 (0.437)	0.679 (0.396)	0.845 (0.679)
retaliated	0.162 (0.098)	0.242 (0.206)	0.175 (0.132)	0.236 (0.230)
Total peer agression	0.689 (0.349)	0.861 (0.552)	0.854 (0.296)	0.911 (0.769)
incited	0.477 (0.256)	0.604 (0.346)	0.637 (0.195)	0.633 (0.540)
retaliated	0.212 (0.121)	0.258 (0.262)	0.217 (0.167)	0.278 (0.254)

Note. The above means represent frequencies per minute.

Aggression Ratios

Peer retaliated/ target incited	0.211 (0.094)	0.395 (0.201)	0.319 (0.201)	0.346 (0.268)
Target retaliated/ peer incited	0.366 (0.128)	0.398 (0.145)	0.274 (0.169)	0.386 (0.287)
Peer incited/ target incited	0.579 (0.231)	1.027 (0.407)	1.303 (0.983)	0.819 (0.386)
Peer total/target total aggression	0.659 (0.174)	1.000 (0.308)	1.202 (0.704)	0.880 (0.331)

Note. Mean aggression ratios represent frequency of first variable per minute divided by frequency of second variable per minute.

Table 9

Means (and Standard Deviations) by Peer Group of Level of Involvement Variables and Associated Ratios for Girls

	Group			
	A	W	AW	C
Target gave attention to peers	0.891 (0.050)	0.802 (0.130)	0.860 (0.057)	0.852 (0.066)
Target elicited attention from peers	0.677 (0.060)	0.560 (0.106)	0.640 (0.083)	0.660 (0.080)
Peers gave attention to target	0.341 (0.025)	0.290 (0.080)	0.346 (0.106)	0.429 (0.100)
Target gave attention/peers gave attention	2.620 (0.179)	2.886 (0.539)	2.701 (0.843)	2.061 (0.378)
Target elicited attention/peers gave attention	1.988 (0.160)	1.991 (0.278)	1.962 (0.469)	1.578 (0.217)
Target's physical activity (motor level)	0.497 (0.054)	0.396 (0.084)	0.434 (0.089)	0.411 (0.054)

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

Table 10

Means (and Standard Deviations) by Peer Group of Level of Involvement Variables and Associated Ratios for Boys

	Group			
	A	W	AW	C
Target gave attention to peers	0.898 (0.047)	0.810 (0.127)	0.871 (0.070)	0.893 (0.069)
Target elicited attention from peers	0.701 (0.061)	0.586 (0.116)	0.670 (0.063)	0.687 (0.087)
Peers gave attention to target	0.403 (0.098)	0.280 (0.120)	0.354 (0.114)	0.378 (0.132)
Target gave attention/peers gave attention	2.364 (0.652)	3.562 (1.930)	2.718 (0.957)	2.615 (0.904)
Target elicited attention/peers gave attention	1.812 (0.346)	2.483 (1.187)	2.062 (0.609)	1.963 (0.538)
Target's physical activity (motor level)	0.505 (0.073)	0.468 (0.074)	0.489 (0.086)	0.482 (0.106)

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

Table 11

Means (and Standard Deviations) by Peer Group of Teacher Variables for Girls

Teacher Factor	Group A	Group W	Group AW	Group C
Anxiety	55.0 (0.0)	58.9 (5.4)	58.3 (4.9)	57.1 (3.2)
Withdrawal	55.6 (1.0)	59.0 (3.6)	60.3 (5.1)	57.2 (3.7)
Depression	61.0 (5.8)	57.7 (3.7)	62.8 (7.1)	57.9 (4.7)
Unpopularity	65.7 (6.9)	57.6 (1.5)	65.8 (6.2)	59.9 (4.1)
Self-destructive	60.6 (3.4)	59.1 (3.0)	62.5 (4.2)	60.4 (4.1)
Inattentive	56.9 (3.0)	55.9 (2.3)	59.9 (5.1)	57.5 (4.1)
Nervous-overactive	60.9 (1.6)	55.9 (1.5)	60.6 (5.4)	57.3 (4.2)
Aggression	64.3 (6.3)	55.4 (1.1)	62.4 (5.6)	56.6 (3.4)
Internalizing	52.0 (1.4)	55.3 (9.0)	56.3 (8.7)	53.2 (7.6)
Externalizing	60.9 (4.7)	48.9 (5.0)	60.5 (7.4)	50.6 (8.8)

Note All means are expressed as T scores.

Table 12

Means (and Standard Deviations) by Peer Group of Teacher Variables for Boys

Teacher Factor	Group A	Group W	Group AW	Group C
Anxiety	57.0 (2.3)	63.1 (4.2)	60.4 (4.6)	57.0 (4.3)
Withdrawal	60.4 (4.1)	66.3 (5.2)	66.7 (8.7)	58.5 (7.7)
Unpopularity	65.7 (6.4)	59.7 (6.6)	72.4 (9.2)	57.1 (3.8)
Self-destructive	62.5 (6.3)	59.2 (5.5)	64.0 (5.8)	57.0 (2.8)
Obsessive-compulsive	61.9 (4.1)	56.6 (4.7)	63.9 (8.0)	57.9 (4.6)
Inattentive	62.7 (4.7)	57.0 (4.6)	71.7 (11.0)	57.1 (4.7)
Nervous-overactive	66.8 (9.4)	57.0 (2.6)	65.0 (9.6)	56.8 (2.6)
Aggression	68.1 (8.1)	55.1 (0.3)	66.8 (8.5)	55.9 (1.5)
Internalizing	57.1 (6.6)	63.7 (2.9)	62.9 (6.2)	49.6 (9.8)
Externalizing	65.9 (8.5)	50.4 (5.7)	67.7 (11.3)	50.5 (8.8)

Note All means are expressed as T scores.

Table 13

Discriminant Function Analysis of Observational Variables Predicting Peer Classifications for Girls

Step Entered	Wilks Lambda	Rao's V	Significance of Change in V
1 Time with opposite or mixed-sex group	0.498	30.27	.000
2 Total peer and target touch	0.364	45.90	.001
3 Target attempts to elicit attention	0.305	54.09	.042
4 Group play with same sex peers	0.266	62.19	.044

Table 14

Group Means for Predictor Variables - Observational Variables Predicting Peer Classifications for Girls

Observational variable	Peer classification group				
	A	W	AW	C	Total
Time with opposite or mixed-sex peers	0.67	0.41	0.47	0.25	0.43
Total peer and target touch	2.57	1.81	2.13	2.30	2.21
Target attempts to elicit attention	0.68	0.56	0.64	0.66	0.64
Group play with same-sex peers	0.08	0.17	0.14	0.33	0.19

Table 15

Standardized Canonical Discriminant Function Coefficients - Observational Variables Predicting Peer Classifications for Girls

	Function	
	1	2
Group play with same-sex peers	0.54	0.29
Time with opposite or mixed-sex group	-0.96	0.18
Total peer and target touch	1.00	0.41
Target attempts to elicit attention	-0.57	0.66

Table 16

Discriminant Functions Evaluated at the Group Centroids - Observational Variables Predicting Peer Classifications for Girls

Function	Peer classification group			
	A	W	AW	C
1	-1.62	-0.03	-0.56	1.72
2	0.57	-0.92	-0.09	0.33

Table 17

Discriminant Function Classification Results - Observational Variables Predicting Peer Classifications for Girls

Actual group	n	Predicted group membership A	W	AW	C
A	7	n=6 85.7%	n=1 14.3%	n=0 0.0%	n=0 0.0%
W	7	n=1 14.3%	n=3 42.9%	n=2 28.6%	n=1 14.3%
AW	10	n=2 20.0%	n=1 10.0%	n=6 60.0%	n=1 10.0%
C	10	n=0 0.0%	n=1 10.0%	n=0 0.0%	n=9 90.0%

Percentage of grouped cases correctly classified - 70.59%

Table 18

Discriminant Function Analysis - Observational Variables Predicting Peer Classifications for Boys

Step Entered	Wilks Lambda	Rao's V	Significance of Change in V
1 Target attempts to elicit attention	0.769	10.51	.015
2 Target aggression in retaliation	0.609	22.03	.009
3 Peer incited/Target incited aggression	0.491	30.62	.035

Table 19

Group Means for Predictor Variables - Observational Variables Predicting Peer Classifications for Boys

Observational variable	Peer classification group				
	A	W	AW	C	Total
Target attempts to elicit attention	0.70	0.59	0.67	0.69	0.66
Target aggression in retaliation	0.18	0.25	0.18	0.25	0.21
Peer incited/Target incited aggression	0.58	1.03	1.30	0.82	0.93

Table 20

Standardized Canonical Discriminant Function Coefficients - Observational Variables Predicting Peer Classifications for Boys

	Function	
	1	2
Peer incited/Target incited aggression	0.22	1.07
Target attempts to elicit attention	1.30	0.23
Target aggression in retaliation	-0.91	-0.04

Table 21

Discriminant Functions Evaluated at the Group Centroids - Observational Variables Predicting Peer Classifications for Boys

Function	Peer classification group			
	A	W	AW	C
1	0.62	-1.33	0.43	0.15
2	-0.53	-0.04	0.71	-0.15

Table 22

Discriminant Function Classification Results -

Observational Variables Predicting Peer Classifications

for Boys

Actual group	n	Predicted group membership			
		A	W	AW	C
A	10	n=8 80.0%	n=0 0.0%	n=0 0.0%	n=2 20.0%
W	9	n=1 11.1%	n=6 66.7%	n=1 11.1%	n=1 11.1%
AW	10	n=4 40.0%	n=0 0.0%	n=4 40.0%	n=2 20.0%
C	10	n=3 30.0%	n=2 20.0%	n=2 20.0%	n=3 30.0%

Percentage of grouped cases correctly classified - 53.85%

Table 23

Between Set Correlation Matrix for PEI Variables and Observational Variables Included in a Canonical Analysis for Girls

Observational variables	Peer rated variables (z scores)		
	Aggression	Withdrawal	Likeability
Group play with same-sex peers	-0.41 *	-0.11	0.05
Time spent alone	-0.20	0.36 *	0.12
Total peer and target touch	0.15	-0.50 **	0.32
Total target aggression	0.38 *	-0.22	-0.16
Target attempts to elicit attention	0.31	-0.37 *	0.06
Peer attention to target	-0.03	-0.29	0.19
Time with opposite or mixed-sex peers	0.54 **	-0.07	-0.07
Target retaliated/peer incited aggression	0.41 *	-0.08	-0.32

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

Table 24

Chi-Square Tests of Successive Latent Roots for Canonical Analysis of PEI variables and Observational Variables for Girls

Number of roots removed	Canonical correlation	Bartlet's test for remaining eigenvalues: Chi-square	df	Tail probability
0	.79	52.47	24	.001
1	.73	26.29	14	.024
2	.44	5.71	6	.457

Table 25

Standardized Canonical Coefficients and Correlation of Canonical Variables with Original Variables -

Canonical Analysis of PEI and Observational Variables for Girls

	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
PEI variables				
Aggression	-0.03	0.30	1.00	1.02
Withdrawal	-0.65	-0.58	0.03	0.00
Likeability	0.76	0.82	-0.35	0.04
Observational Variables				
Group play with same-sex peers	-0.02	0.82	-0.57	-0.48
Time spent alone	-0.22	0.77	-0.27	0.10
Total peer and target touch	0.76	1.27	0.22	-0.60
Total target aggression	0.15	-0.24	0.52	-0.18
Target attempts to elicit attention	0.46	-0.52	0.43	0.84
Peer attention to target	0.40	0.83	-0.03	0.10
Time with opposite or mixed-sex peers	0.18	0.94	0.74	0.62
Target retaliated/ peer incited aggr.	-0.12	0.11	0.55	0.31

Table 26

Between Set Correlation Matrix for PEI Variables and Observational Variables Included in a Canonical Analysis for Boys

Observational variables	Peer rated variables (z scores)		
	Aggression	Withdrawal	Likeability
Peer play with same-sex peers	-0.14	0.11	0.07
Time spent alone	-0.23	0.29	-0.11
Total peer and target touch	0.27	-0.32 *	0.16
Total target aggression	-0.03	-0.23	0.31
Target attempts to elicit attention	0.34 *	-0.41 **	0.27
Peer attention to target	0.21	-0.35 *	0.26
Target activity level	0.20	-0.20	0.31
Peer incited/target incited aggression	-0.09	0.41 **	-0.32 *

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

Table 27

Chi-Square Tests of Successive Latent Roots for Canonical Analysis of PEI variables and Observational Variables for Boys

Number of roots removed	Canonical correlation	Bartlet's test for remaining eigenvalues: Chi-square	df	Tail probability
0	.81	43.68	24	.008
1	.42	9.52	14	.800
2	.31	3.15	6	.790

Table 28

Standardized Canonical Coefficients and Correlation of Canonical Variables with Original Variables -

Canonical Analysis of PEI and Observational Variables for Boys

	First Canonical Variate	
	Correlation	Coefficient
PEI variables		
Aggression	0.68	0.82
Withdrawal	-0.70	-0.32
Likeability	0.39	0.56
Observational Variables		
Peer play with same-sex peers	-0.14	-0.62
Time spent alone	-0.43	0.30
Total peer and target touch	0.51	0.11
Total target aggression	0.28	-0.66
Target attempts to elicit attention	0.69	0.54
Peer attention to target	0.53	0.86
Target activity level	0.49	0.50
Peer incited/target incited aggression	-0.47	-0.20

Table 29

Discriminant Function Analysis - Teacher Variables Predicting Peer Classifications for Girls

Step Entered	Wilks Lambda	Rao's V	Significance of Change in V
1 Teacher aggression	0.589	20.94	.000
2 Teacher withdrawal	0.455	30.54	.022

Table 30

Group Means for Predictor Variables - Teacher Variables Predicting Peer Classifications for Girls

Teacher variable	Peer classification group				
	A	W	AW	C	Total
Teacher aggression	64.29	55.43	62.40	56.60	59.65
Teacher withdrawal	55.57	59.00	60.30	57.20	58.15

Table 31

Standardized Canonical Discriminant Function Coefficients - Teacher Variables Predicting Peer Classifications for Girls

	Function	
	1	2
Teacher withdrawal	-0.42	0.94
Teacher aggression	1.01	0.18

Table 32

Discriminant Functions Evaluated at the Group Centroids - Teacher Variables Predicting Peer Classifications for Girls

Function	Peer classification group			
	A	W	AW	C
1	1.30	-1.02	0.37	-0.57
2	-0.45	0.04	0.64	-0.35

Table 33

Discriminant Function Classification Results -

Teacher Variables Predicting Peer Classifications

for Girls

Actual group	n	Predicted group membership			
		A	W	AW	C
A	7	n=6 85.7%	n=0 0.0%	n=1 14.3%	n=0 0.0%
W	7	n=0 0.0%	n=4 57.1%	n=0 0.0%	n=3 42.9%
AW	10	n=3 30.0%	n=1 10.0%	n=4 40.0%	n=2 20.0%
C	10	n=1 10.0%	n=1 10.0%	n=1 10.0%	n=7 70.0%

Percentage of grouped cases correctly classified - 61.76%

Table 34

Discriminant Function Analysis -

Teacher Variables Predicting Peer Classifications

for Boys

Step	Entered	Wilks Lambda	Rao's V	Significance of Change in V
1	Teacher aggression	0.475	38.67	.000
2	Teacher inattentive	0.334	55.41	.001
3	Teacher withdrawal	0.243	72.51	.01
4	Teacher obsessive-compulsive	0.173	92.44	.000

Table 35

Group Means for Predictor Variables - Teacher Variables Predicting Peer Classifications for Boys

Teacher variable	Peer classification group				
	A	W	AW	C	Total
Teacher aggression	68.10	55.11	66.80	55.90	61.64
Teacher inattentive	62.70	57.00	71.70	57.10	62.26
Teacher withdrawal	60.40	66.33	66.70	58.50	62.90
Teacher obsessive-compulsive	61.90	56.56	63.90	57.90	60.15

Table 36

Standardized Canonical Discriminant Function Coefficients - Teacher Variables Predicting Peer Classifications for Boys

	Function	
	1	2
Teacher aggression	0.69	-0.17
Teacher inattentive	0.30	1.37
Teacher withdrawal	-0.82	0.75
Teacher obsessive-compulsive*	0.57	-1.36

Table 37

Discriminant Functions Evaluated at the Group Centroids - Teacher Variables Predicting Peer Classifications for Boys

Function	Peer classification group			
	A	W	AW	C
1	1.25	-1.76	0.92	-0.58
2	-0.80	0.39	1.24	-0.80

Table 38

Discriminant Function Classification Results -

Teacher Varisbles Predicting Peer Classifications

for Boys

Actual group	n	Predicted group membership			
		A	W	AW	C
A	10	n=7 70.0%	n=0 0.0%	n=1 10.0%	n=2 20.0%
W	9	n=0 0.0%	n=7 77.8%	n=0 0.0%	n=2 22.2%
AW	10	n=1 10.0%	n=1 10.0%	n=6 60.0%	n=2 20.0%
C	10	n=0 0.0%	n=2 20.0%	n=0 0.0%	n=8 80.0%

Percentage of grouped cases correctly classified - 71.80%

Table 39

Between Set Correlation Matrix for PEI Variables and Teacher Variables Included in a Canonical Analysis for Girls

Observational variables	Peer rated variables (z scores)		
	Aggression	Withdrawal	Likeability
Teacher anxiety	-0.17	0.24	-0.17
Teacher withdrawal	-0.03	0.34 *	-0.35 *
Teacher depression	0.42 *	0.05	-0.31
Teacher unpopularity	0.57 **	0.03	-0.41 *
Teacher inattentive	0.24	0.02	-0.47 **
Teacher nervous-overactive	0.54 **	-0.16	-0.27
Teacher aggression	0.66 **	-0.12	-0.40 *

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

Table 40

Chi-Square Tests of Successive Latent Roots for Canonical Analysis of PEI variables and Teacher Variables for Girls

Number of roots removed	Canonical correlation	Bartlet's test for remaining eigenvalues: Chi-square	df	Tail probability
0	.76	37.75	21	.014
1	.56	13.80	12	.314
2	.35	3.62	5	.605

Table 41

Standardized Canonical Coefficients and Correlation of Canonical Variables with Original Variables -

Canonical Analysis of PEI and Teacher Variables for Girls

	First Canonical Variate	
	Correlation	Coefficient
PEI variables		
Aggression	0.93	0.91
Withdrawal	-0.34	-0.37
Likeability	-0.39	-0.07
Teacher Variables		
Teacher anxiety	-0.30	-0.39
Teacher withdrawal	-0.17	-0.22
Teacher depression	0.50	0.15
Teacher unpopularity	0.74	0.25
Teacher inattentive	0.32	0.16
Teacher nervous-overactive	0.75	0.38
Teacher aggression	0.88	0.29

Table 42

Between Set Correlation Matrix for PEI Variables and Teacher Variables Included in a Canonical Analysis for Girls

Teacher variables	Peer rated variables (z scores)		
	Aggression	Withdrawal	Likeability
Teacher internalizing	-0.04	0.17	-0.23
Teacher externalizing	0.69 **	-0.08	-0.64 **

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

Table 43

Chi-Square Tests of Successive Latent Roots for Canonical Analysis of PEI variables and Teacher Variables for Girls

Number of roots removed	Canonical correlation	Bartlet's test for remaining eigenvalues: Chi-square	df	Tail probability
0	.85	42.07	6	.000
1	.30	2.85	2	.241

Table 44

Standardized Canonical Coefficients and Correlation of Canonical Variables with Original Variables -

Canonical Analysis of PEI and Teacher Variables for Girls

	First Canonical Variate	
	Correlation	Coefficient
PEI variables		
Aggression	0.88	0.71
Withdrawal	-0.18	-0.24
Likeability	-0.71	-0.46
Teacher Variables		
Teacher internalizing	0.04	-0.36
Teacher externalizing	0.94	1.08

Table 45

Between Set Correlation Matrix for PEI Variables and Teacher Variables Included in a Canonical Analysis for Boys

Teacher variables	Peer rated variables (z scores)		
	Aggression	Withdrawal	Likeability
Teacher withdrawal	-0.09	0.50 **	-0.26
Teacher aggression	0.75 **	-0.13	-0.20
Teacher obsessive-compulsive	0.40 *	0.03	-0.36 *
Teacher unpopularity	0.55 **	0.21	-0.39 *
Teacher inattentive	0.51 **	0.15	-0.44 **

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

Table 46

Chi-Square Tests of Successive Latent Roots for Canonical Analysis of PEI variables and Teacher Variables for Boys

Number of roots removed	Canonical correlation	Bartlet's test for remaining eigenvalues: Chi-square	df	Tail probability
0	.84	60.42	15	.000
1	.59	18.89	8	.015
2	.35	4.51	3	.211

Table 47

Standardized Canonical Coefficients and Correlation of Canonical Variables with Original Variables - Canonical Analysis of PEI and Teacher Variables for Boys

	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
PEI variables				
Aggression	0.95	0.90	0.31	0.52
Withdrawal	-0.49	-0.30	0.87	0.99
Likeability	-0.18	0.03	-0.54	0.04
Teacher variables				
Teacher withdrawal	-0.29	-0.70	0.73	0.59
Teacher aggression	0.84	0.71	0.42	-0.10
Teacher obsessive-compulsive	0.41	0.37	0.37	-0.82
Teacher unpopularity	0.50	-0.07	0.81	0.92
Teacher inattentive	0.47	0.19	0.66	0.27

Table 48

Chi-Square Tests of Successive Latent Roots for Canonical Analysis of PEI Variables and Teacher Variables for Boys

Number of roots removed	Canonical correlation	Bartlet's test for remaining eigenvalues: Chi-square	df	Tail probability
0	.77	48.29	6	.000
1	.61	16.54	2	.000

Table 49

Between Set Correlation Matrix for PEI Variables and Teacher Variables Included in a Canonical Analysis for Boys

Teacher variables	Peer rated variables (z scores)		
	Aggression	Withdrawal	Likeability
Teacher internalizing	0.06	0.59 **	-0.38 *
Teacher externalizing	0.70 **	-0.03	-0.48 **

**p<.01
* p<.05

Table 50

Standardized Canonical Coefficients and Correlation of Canonical Variables with Original Variables -

Canonical Analysis of PEI and Teacher Variables for Boys

	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
PEI variables				
Aggression	0.94	0.75	0.22	0.31
Withdrawal	-0.43	-0.41	0.90	0.87
Likeability	-0.41	-0.30	-0.68	-0.22
Teacher variables				
Teacher internalizing	-0.11	-0.53	0.99	0.95
Teacher externalizing	0.87	1.08	0.49	0.12

Table 51

Between Set Correlation Matrix for Teacher Variables and Observational Variables Included in a Canonical Analysis for Girls

Observational variables	Teacher rated variables	
	Internalizing	Externalizing
Time spent alone	0.24	-0.26
Opposite/same-sex play	0.04	0.48 **
Total peer proximity	0.37 *	0.01
Total peer and target touch	-0.20	0.08
Total target aggression	0.11	0.51 **
Target attempts to elicit attention	-0.31	0.29

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

Table 52

Chi-Square Tests of Successive Latent Roots for Canonical Analysis of Teacher Variables and Observational Variables for Girls

Number of roots removed	Canonical correlation	Bartlet's test for remaining eigenvalues: Chi-square	df	Tail probability
0	.69	29.05	12	.004
1	.55	10.32	5	.067

Table 53

Standardized Canonical Coefficients and Correlation of Canonical Variables with Original Variables -

Canonical Analysis of Teacher and Observational Variables for Girls

	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
Teacher variables				
Teacher internalizing	-0.43	-0.79	0.91	0.73
Teacher externalizing	0.68	0.98	0.73	0.46
Observational Variables				
Time spent alone	-0.64	-0.27	0.11	-0.33
Opposite/same-sex play	0.64	0.47	0.46	0.31
Total peer proximity	-0.41	-0.26	0.50	0.71
Total peer and target touch	0.34	-0.29	-0.20	-0.40
Total target aggression	0.59	0.02	0.57	0.65
Target attempts to elicit attention	0.76	0.68	-0.18	-0.49

Table 54

Between Set Correlation Matrix for Teacher Variables and Observational Variables Included in a Canonical Analysis for Boys

Observational variables	Teacher rated variables	
	Anxiety	Aggression
Time spent alone	0.15	-0.13
Target slap incited	0.12	0.43 **
Target total aggression	-0.11	0.05
Target gives attention	-0.32 *	0.11
Target activity level	-0.19	0.20
Peer attention to target	-0.31	0.20

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

Table 55

Chi-Square Tests of Successive Latent Roots for Canonical Analysis of Teacher Variables and Observational Variables for Boys

Number of roots removed	Canonical correlation	Bartlet's test for remaining eigenvalues: Chi-square	df	Tail probability
0	.59	25.16	12	.014
1	.53	10.94	5	.052

Table 56

Standardized Canonical Coefficients and Correlation of Canonical Variables with Original Variables -

Canonical Analysis of Teacher and Observational Variables for Boys

	First Canonical Variate		Second Canonical Variate	
	Correlation	Coefficient	Correlation	Coefficient
Teacher variables				
Teacher anxiety	0.14	0.31	0.99	0.97
Teacher aggression	0.95	1.00	-0.30	-0.14
Observational Variables				
Time spent alone	-0.14	-0.45	0.32	-0.47
Target slap incited	0.79	0.97	0.10	0.31
Target total aggression	0.04	-0.76	-0.21	0.82
Target gives attention	0.02	-0.66	-0.61	-0.67
Target activity level	0.25	0.52	-0.41	0.56
Peer attention to target	0.18	0.49	-0.63	-1.04

Appendix C

Documentation
High Risk Observational Study

DOCUMENTATION
HIGH RISK OBSERVATIONAL STUDY

Photo Session & Children Identification System

1. Lists of students from the peer nomination test administration were used. On each list, children's names were divided in two groups: males and females. Each male group ranked from 01 to n (n = total number of boys in one class) and each female group ranked from n+1 to N (N = total number of students for that same class). Children's numbers were assigned in an alphabetical order.

2. photo Session: Olympus OM.10, 35 mm camera, 6 x 36 exposure film and flash.
After consulting with school authorities, an appropriate time was determined to do the photo session. The experimenter introduced herself asking the children if they would agree to have their picture taken in small groups to complete our study on the peer nomination test they had so successfully filled out.

*no children refused to participate

*many children asked if they could see the pictures when they would be available - experimenter suggested that at the end of the school term, the pictures may be on display and that this would be discussed with school authorities and professors in charge of the project.

The children were called following peer nomination ranking order forming small groups of 2, 3 or 4; boys and girls separately and their pictures were taken in that order.

The children were then asked to get their outdoors winter clothes and photographs were taken in the same order as above.

3. Classification system

Each film was numbered and its contents identified on a separate sheet: ex. Film I class 3A, 3B, 3C (Boys only)
Film II class 3C (Boys in winter clothes and girls all), and 4A, 4B.
Pictures were then inserted in 8 1/2 x 11 transparent sheets.

A list of all children selected for the observational study was developed and those children were identified on the photographs with a brown self-adhesive dot label containing each child's number from the Peer Nomination Test.

*the teacher of each class was asked to verify accuracy of the identification.

A random selection of observation list was produced and the first

six children selected for observation were identified with a yellow self-adhesive dot label placed below their brown label. The yellow labels were marked 1 to 6 following the order of observation proposed by the observation list.

Scheduling

Filmers' schedule was determined by the school calendar recess times and weather forecast. In school 1, morning recesses were favored for their longer duration (15 minutes). In the second school filming was carried out during both morning and afternoon 15-minute recesses providing the weather was favorable.

Equipment and Filming Procedure

Prior to filming, the filming crews studied the target children's photographs and visited the school on several occasions to assess which location would offer the best perspective on the playground.

Filmers collected information from school teachers and the school principal concerning the favorite play area for each grade level. A diagram of the playground was developed including dodge ball squares and hopscotch markings. The preferred area of play was noted for each grade level and class. Filmers also obtained a calendar of activities and holidays from the school to establish a filming schedule.

Filming

Equipment:
Two SLO 340 Beta pack portable videotape recorders from Sony
Two HVC 2200 colour video cameras from Sony
L500 Sony videotapes
Two 7 x 50 Bell & Howell Binoculars
Two Multiple event stopwatches
Pictures of the target children

Procedure: The filming crew arrived at the school a few minutes before recess to set up their equipment in a room situated on the second storey of the school and overlooking the entire playground. A random list of target children to observe for the day was developed and filmers studied these children's outdoors clothing as well as finding their favorite area of play in the schoolyard.

Each filming crew consisted of a spotter and a filmer - the spotter's responsibility was to find a target child on the playground with the help of binoculars, describe that child to the filmer, and time the filming segment for 2 minutes and 15 seconds once the filming started. As soon as filming started, the spotter would try to locate another target child for the filmer before the end of the first segment.

The filmer's responsibility consisted of filming the target child and reporting the disappearance of that child or the

introduction of another target child in the field of vision if it occurred.

Filming was interrupted at the ring of bell indicating the end of recess.

The filming crew then returned to the center to log their filming and prepare a list of target children to film for the next observation session.

Appendix D

Observational Code Description

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 E

Observational Coding Procedure

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

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

PRELIMINARY PREPARATION

A) Turning on the MORE unit

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

B) Beginning a Session

The following procedure must be followed precisely.

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

C) Session Identification

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

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

D) Trial Identification

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

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

E) Context

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

F) Synchronization Process

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

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

2) Begin the video-tape.

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

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

THE CODING SESSION

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

A) First Pass

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

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

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

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

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

If the child is in play:

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

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

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

If child is alone and not in play:

1- not proximal to anyone

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

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

B) Second Pass

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

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

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

TOUCH

01- target touch
02- peer touch

PEER AGGRESSION

41- peer incites aggression
42- peer retaliates aggression

TARGET AGGRESSION

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

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

C) Third Pass

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

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

Level of Involvement

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

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

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

Motor Level of Target

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

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

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

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

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

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

Errors during a coding session

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

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

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

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

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

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

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

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

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

MORE Dump to Cassette Instructions

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

Dump to Cassette

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

Verifying the Dump

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

Appendix F

Teacher Report Form
(Edelbrock & Achenbach, 1984)

Inventaire du Comportement de l'élève

Age de l'élève | Sexe de l'élève M___ F___ | Race | Nom de l'enfant

Niveau scolaire | Ce formulaire a été rempli par: Professeur ___ Autre (précisez)_____ | Ecole:

Date

Genre de travail des parents (précisez: ex: mécanicien automobile, professeur, ménagère, vendeur de souliers etc.)

Genre de travail du père:_____

Genre de travail de la mère_____

I. Depuis combien de temps connaissez-vous cet élève? _____

II. Connaissez-vous bien cet élève?

___Très bien ___Modérément bien ___Pas très bien

III. Combien de temps l'élève passe-t-il (ou elle) dans votre classe par semaine?

IV. De quel genre de classe s'agit-il? (précisez s'il s'agit d'un cours particulier, ex. mathématique 5e année ou titulaire 4e année, etc.)

V. Est-ce que l'enfant a déjà été référé pour placement dans une classe spéciale, ou pour des services sociaux, ou pour tutorat?

___Non ___Je ne sais pas ___Oui Quel genre et quand?

VI. L'élève a-t-il (ou elle) déjà doublé une année scolaire?

___Non ___Je ne sais pas ___Oui Précisez le niveau scolaire et la raison.

VII. Rendement scolaire actuel - Inscrire les matières et cocher la colonne appropriée par rapport à la moyenne.

Sujet académique	très inférieur	en dessous	moyen	en dessus	très supérieur
1.					
2.					
3.					
4.					
5.					
6.					

VIII: Comparé à d'autres élèves du même âge: (utilisez l'échelle ci-dessous)

1. Beaucoup moins 2. Passablement moins 3. Un peu moins
4. Dans la moyenne 5. Un peu plus 6. Passablement plus
7. Beaucoup plus

1. Travaille-t-il (ou elle) fort? ___
2. Son comportement est-il (ou elle) approprié? ___
3. Combien ~~apprend~~-il (ou elle)? ___
4. Est-il (ou elle) heureux? ___

Utilisez cet espace, si vous le jugez nécessaire, pour ajouter d'autres commentaires sur le travail, les aptitudes, ou le comportement de l'élève.

LISTE DES ITEMS

Voici une liste d'items qui peuvent décrire les élèves. Considérez chaque item comme décrivant l'élève maintenant ou ces deux dernier mois. Inscrivez vos cotes dans la case appropriée sur les feuilles de réponses. L'élève recoit la cote 2 si un item est très vrai ou souvent vrai pour lui ou elle. La cote 1 indique que l'item est quelque peu ou parfois vrai de l'élève. La cote 0 indique que l'item n'est pas vrai de l'élève ou que vous n'avez pas d'informations pour juger de cet item pour l'élève.

1. Se comporte d'une façon trop jeune pour son âge.
2. Fredonne ou fait d'autres bruits étranges en classe.
3. Se dispute beaucoup.
4. Ne termine pas les choses qu'il (elle) commence.
5. Se comporte comme l'autre sexe.
6. Défie au répond aux personnel enseignant.
7. Se vante.
8. Ne peut pas concentrer son attention pour longtemps.
9. Ne peut pas cesser de penser à certaines choses, a des obsessions (expliquez).
10. Ne peut pas rester assis(e): est agité(e), ou hyperactif(ve).
11. S'accroche aux adultes ou est trop dépendant.
12. Se plaint de se sentir seul(e).
13. Confus ou semble être dans le brouillard.
14. Pleure beaucoup.
15. A la bougeotte.

16. Cruel(le), brutal ou méchant envers les autres.

17. Perdu dans ses rêveries ou ses pensées.

18. Se fait mal exprès ou essaie de se suicider.

19. Exige beaucoup d'attention.

20. Détruit ses propres choses.

21. Détruit des objets qui appartiennent à d'autres.

22. A de la difficulté à suivre les directives.

23. Désobéissant à l'école.

24. Dérange les autres élèves.

25. Ne s'entend pas avec d'autres enfants.

26. Ne semble pas se sentir coupable après s'être mal comporté(e).

27. Facilement jaloux(se).

28. Mange ou boit autre chose que de la nourriture.

29. A peur de certains animaux, de certaines situations ou d'endroits autre que l'école.

30. A peur d'aller à l'école.

31. A peur d'avoir des mauvaises pensées ou de faire quelque chose de mal.

32. Pense qu'il (ou elle) doit être parfait(e).

33. Pense ou se plaint que personne ne l'aime.

34. Pense qu'on le persécute.

35. Se croit bon à rien ou inférieur(e).

36. Se fait souvent mal, est prédisposé(e) aux accidents.

37. Se bagarre souvent.

38. Se fait taquiner beaucoup.

39. Fréquente des enfants qui s'attirent des ennuis.

40. Croit entendre des sons qui n'existent pas (expliquez).

41. Impulsif(ve) ou agit sans réfléchir.

42. Aime la solitude.

43. Ment ou triche.

44. Ronge ses ongles.

45. Nerveux(se), stressé(e), tendu(e).

46. Mouvements nerveux ou contractions involontaires répétées (expliquez).

47. A une attitude trop conformiste face aux règlements.

48. Pas aimé(e) par les autres élèves.

49. A des difficultés d'apprentissage.

50. Trop peureux(se) ou anxieux(se).

51. A des étourdissements.

52. Se sent trop coupable.

53. N'attend pas son tour pour parler.

54. Trop fatigué(e).

55. Pèse plus que le moyenne.

56. Problèmes physiques sans cause médicale connue:

    a. des douleurs ou des malaises
    b. maux de tête
    c. nausée, se sent mal
    d. problèmes avec les yeux (expliquez)
    e. éruptions ou autres problèmes de la peau.
    f. maux d'estomac ou crampes.
    g. vomissements
    h. autre (expliquez)

57. Attaque les gens physiquement.

58. Joue dans son nez, se gratte la peau ou autres parties du corps (expliquez).

59. Dort en classe.

60. Apathique et manque de motivation.

61. Travaille mal à l'école.

62. Mal coordonné(e) ou malsdroit(e).

63. Préfère jouer avec des enfants plus âgés.

64. Préfère jouer avec des enfants plus jeunes.

65. Refuse de parler.

66. Répète sans cesse certains actes; est compulsif (expliquez).

67. Dérange la classe.

68. Hurle beaucoup.

69. Renfermé(e), garde les choses pour soi.

70. Voit des choses qui ne sont pas là (expliquez).

71. Est timide ou facilement embarassé(e).

72. Son travail n'est pas ordonné.

73. Se comporte de façon irresponsable (expliquez).

74. Fait le fin ou le bouffon.

75. Est gêné(e) ou timide.

76. Son comportement est explosif et imprévisible.

77. Les demandes doivent être acquiescées immédiatement et est facilement frustré.

78. N'est pas attentif et est facilement distrait.

79. Problèmes d'élocution (expliquez).

80. A le regard vague.

81. Se sent blessé(e) lorsqu'il (ou elle) est critiqué(e).

82. Vole.

83. Amasse ce dont il (ou elle) n'a pas besoin (expliquez).

84. Comportement étrange (expliquez).

85. Idées étranges (expliquez).

86. Entêté(e), maussade, ou irritable.

87. Soudains sauts d'humeur ou de sentiments.

88. Boude beaucoup.

89. Méfiant(e).

90. Sacre ou se sert de mots obscènes.

91. Parle de se tuer.

92. Ne fournit pas son rendement maximum.

93. Parle trop.

94. Taquine beaucoup.

95. Accès de colère, des crises, ou s'emporte facilement (expliquez).

96. Semble préoccupé par le sexe.

97. Menace les gens.

98. Est en retard à l'école ou en classe.

99. Trop préoccupé(e) par l'ordre ou la propreté.

100. Ne fait pas ses travaux.

101. Fait l'école buissonnière, manque l'école.

102. Trop peu actif(ve), mouvements lents ou manque d'énergie.

103. Malheureux(se), triste ou déprimé.

104. Exceptionellement bruyant.

105. Se sert d'alcool ou de drogues (expliquez).

106. Est très anxieux de plaire.

107. N'aime pas l'école.

108. A peur de commettre des erreurs.

109. Pleurniche.

110. Manque de propreté dans son apparence personnelle.

111. Retiré(e), ne se mêle pas aux autres.

112. Se fait des soucis.

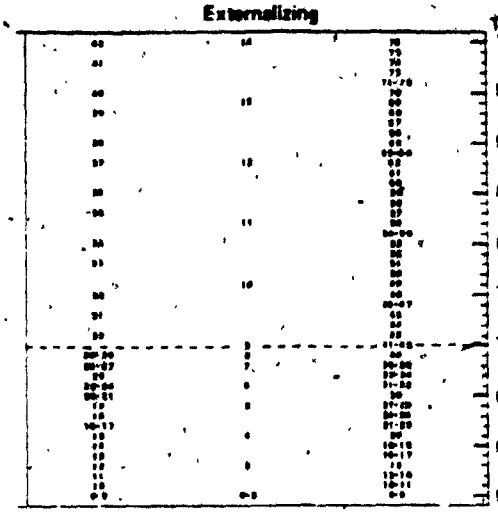
113. Veuillez indiquer sur le feuille de réponse tout problème que l'élève peut avoir et qui n'est pas indiqué ci haut.

Veuillez vous assurer d'avoir repondu a chaque item.

Appendix G

Scoring Profile for Teacher Report Forms
Boys 6-11 Years

– Boys Aged 6-11



Name _____

Sex _____

Sum Int _____

Int T _____

Sum Ext _____

Ext T _____

Age _____

No. of Items _____

Sum T _____

VI INATTENTIVE

__ 1. Acts too young
__ 2 Hums makes odd noises
__ 4 Fails to finish things
__ 8. Can't concentrate
__ 13 Confused
__ 15 Fidgets
__ 17. Daydreams
__ 22 Can't follow directions
__ 24. Disturbs others
__ 46 Difficulty learning
__ 54 Overtired
__ 60 Apathetic
__ 61 Poor schoolwork
__ 62 Clumsy
__ 72 Messy work
__ 73 Irresponsible
__ 78. Inattentive
__ 80 Stares blankly
__ 92 Underachieving
__ 100 Doesn't carry out tasks
__ 102. Underactive

____ TOTAL

VII NERVOUS-OVERACTIVE

__ 10 Hyperactive
__ 15 Fidgets
__ 44. Restless
__ 46 Nervous
__ 48 Nervous movements, twitches
__ 72 Messy work
__ 83 Hoarding

____ TOTAL

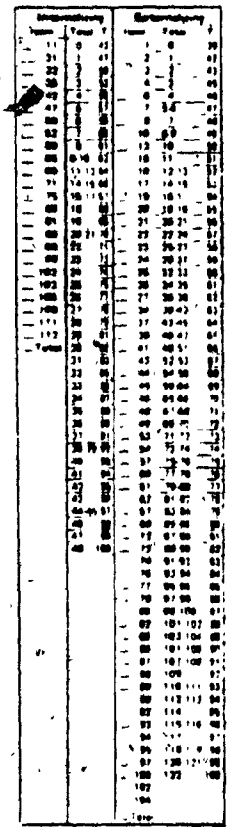
VIII AGGRESSIVE

__ 3 Argues
__ 6. Defiant
__ 7 Bragging
__ 15 Fidgets
__ 16. Cruelty
__ 19 Demands attention
__ 20 Destroys own things
__ 21 Destroys other's things
__ 23 Disobedient at school
__ 24 Disturbs others
__ 25 Poor peer relations
__ 26. Lacks guilt
__ 27 Jealous
__ 34 Feels persecuted
__ 37 Fights
__ 38 Bad friends
__ 41 Impulsive
__ 43 Lying, cheating
__ 46 Not liked
__ 53 Talks out of turn
__ 57 Attacks people
__ 67 Disrupts class
__ 68 Screams
__ 73. Acts irresponsibly
__ 74 Shows off
__ 76. Explosive
__ 77 Easily frustrated
__ 82 Steals
__ 86 Stubborn
__ 87 Moody
__ 88 Sulks
__ 89 Suspicious
__ 90 Swearing
__ 93 Talks too much
__ 94 Teases
__ 95 Temper tantrums
__ 97 Threatens
__ 104 Loud

____ TOTAL

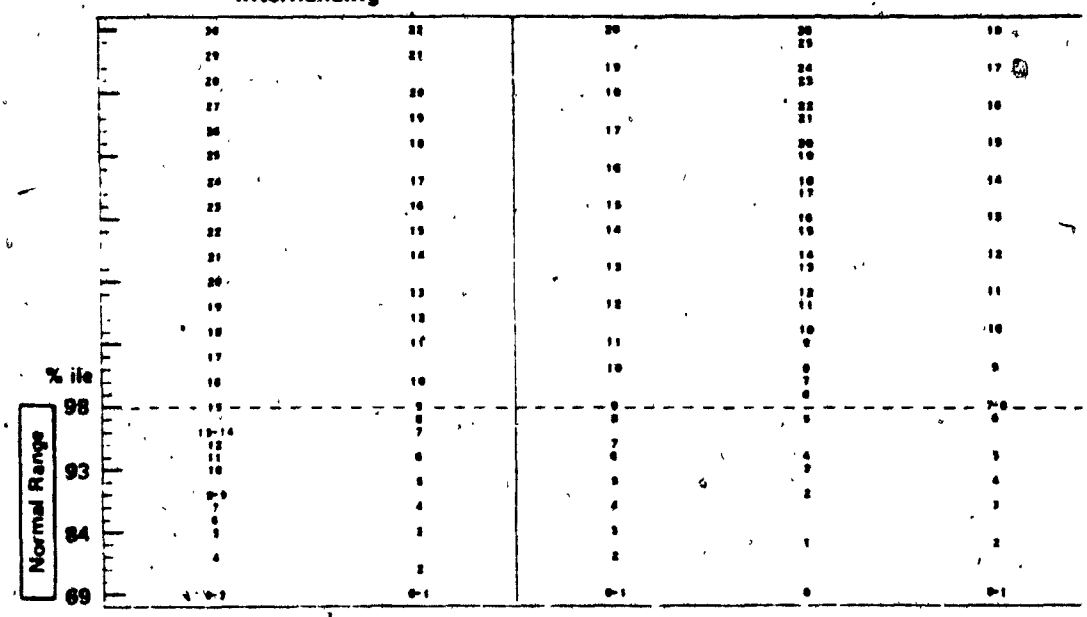
OTHER PROBLEMS

__ 5 Acts like opposite sex
__ 14 Cries
__ 30 Fears school
__ 40 Hears things that aren't there
__ 51 Dizziness
__ 56 Overweight
__ 56a Pains
__ 56b Headaches
__ 56c Nausea
__ 56d Eye problems
__ 56e Rashes
__ 56f Stomach problems
__ 56g Vomits
__ 56h Other physical problems
__ 59 Sleeps in class
__ 63 Prefers older kids
__ 70 Sees things that aren't there
__ 79 Speech problems
__ 85 Sex pre occupation
__ 98 Tardiness
__ 101 Truancy
__ 105 Alcohol or drugs
__ 107 Dislikes school
__ 109 Whining
__ 113 Other problems



Teacher Reported Behavior Problems

Internalizing



I ANXIOUS	II SOCIAL WITHDRAWAL	III UNPOPULAR	IV SELF DESTRUCTIVE	V OBSESSIVE-COMPULSIVE
___ 11 Clings to adults	___ 42 Likes to be alone	___ 1. Acts too young	___ 18 Harms self	___ 2. Hums, makes odd noises
___ 31. Fears own impulses	___ 60 Apathetic	___ 11. Clings to adults	___ 20. Destroys own things	___ 9 Obsessions
___ 32. Needs to be perfect	___ 65. Won't talk	___ 12. Lonely	___ 21. Destroys others' things	___ 13. Confused
___ 35 Feels worthless	___ 69 Secretive	___ 25. Poor peer relations	___ 28. Eats nonfood	___ 28. Eats nonfood
___ 47. Overconforms	___ 75 Shy, timid	___ 33. Feels unloved	___ 29. Fears	___ 46. Nervous movements, twitches
___ 50 Anxious	___ 80. Stares blankly	___ 34 Feels persecuted	___ 36. Accident prone	___ 66 Compulsions
___ 52. Feels guilty	___ 86. Stubborn	___ 35 Feels worthless	___ 44 Nailbiting	___ 80. Stares blankly
___ 69. Secretive	___ 88. Sulks	___ 38. Is teased	___ 52. Feels guilty	___ 84. Strange behavior
___ 71 Self-conscious	___ 102. Slow, underactive	___ 48 Unliked	___ 58 Picking	___ 85. Strange ideas
___ 75 Shy, timid	___ 103 Sad	___ 64 Prefers young kids	___ 62. Clumsy	___ TOTAL
___ 81. Feels hurt when criticized	___ 111. Withdrawn	___ TOTAL	___ 84. Strange behavior	
___ 99 Too neat	___ TOTAL		___ 91 Suicidal talk	
___ 106. Anxious to please			___ 110. Unclean	
___ 108 Fears mistakes			___ TOTAL	
___ 112. Worrying				
___ TOTAL				

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