

UNIVERSITY OF CALGARY

LEARNING DISABILITY SUBTYPES: SOCIAL DEFICITS  
AND VALIDITY FOR SOCIAL SKILL TRAINING

BY

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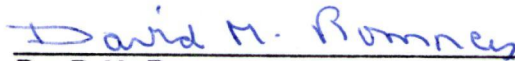
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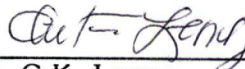
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## ABSTRACT

The development of social skill training programs for the learning disabled (LD) rests upon two implicit assumptions: 1) the LD are unique in their maladaptive social behaviour, and 2) social skill training for the LD must be tailored to the needs of the individual child. The present study sought to test these assumptions by: a) comparing the behaviour problems and social deficit profiles of 36, 9- to 12-year-old LD boys on the Bristol Social Adjustment Guides, the Social Behaviour Assessment, and the Self-Control Rating Scale with those of 12 slow learners (SLs) and 12 behaviourally disordered, normal achievers (BD) of the same age; b) testing to see if the three LD subtypes ( $n = 12$ ) comprising the LD sample display subtype-specific social deficits; and c) testing the validity of grouping LD subjects into these LD subtypes for social skill training by assessing differences in their responsivity to verbal and nonverbal cues.

The results revealed: a) that SLs are more socially skilled than the LD who, in turn, are more socially skilled than the BD, b) SLs have a flat profile of deficits across the skill, performance, and self-control social domains, c) the LD have an increasing profile of deficits across these domains, and d) the deficit profile of BD students reaches a plateau at the performance domain.

The deficit ratings of LD subjects showed: a) that verbally impaired (subtype I) children have more social deficits than distractible (subtype III) subjects who, in turn, have more social deficits than nonverbally impaired (subtype II) subjects, and b) that subtypes I and III have more self-control deficits in particular than subtype II children.



With the exception of subtype II children under nonverbal training, verbal and nonverbal cues were equally effective in enhancing the accuracy of the LD subtypes in identifying a number of affective states which were modelled by a videotaped actress. A post hoc analysis of the training results for all subject groups employed revealed that only those groups characterized by an impulsive, poorly self-controlled orientation (i.e., the BD and subtypes I and III) showed improved attentiveness irrespective of the nature of the training provided. This suggested that subtypes I and III may have been responding to an element in both training programs which served to provide a form of self-control training.

It was concluded: a) that the problematic social behaviour of the LD differs quantitatively and qualitatively from that of SLs and the BD, and from this, that the LD are unlikely to be well served by social skill training programs developed for these groups, b) that there may be two social-behaviour groups in the LD population whose social behaviour reflects cognitive differences between these groups in their capacity for self-control, and c) that these social-behaviour groups may represent useful LD subject groupings for social skill training.

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## CHAPTER ONE

### INTRODUCTION

#### Statement of the Problem

That many learning disabled (LD) children exhibit problematic social behaviour has long been recognized. Nevertheless, interest in their social functioning remained well eclipsed by concern for their academic problems since poor achievement was considered their most serious limitation. In the last decade, however, the social functioning of the LD has emerged as a major area of study in the LD literature which appears to have been prompted by the Cowen, Pederson, Babigian, Izzo & Trost (1973) study showing that social problems in childhood are often associated with serious adjustment difficulties in adolescence and adulthood. Unfortunately, though, it appears that this emerging field is built largely upon the assumption that the LD are unique in terms of their problematic social behaviour since: a) the bulk of the research to date has employed only contrasts between the LD and their nonhandicapped peers (Harris, 1982), and b) the development of social skill training programs for the LD (e.g., Schumaker & Hazel, 1984b) has proceeded with little or no regard for findings from research involving other groups of exceptional students, such as slow learners and the behaviourally disordered, who also present problematic social behaviour.

Clearly, if the LD do present unique social skill difficulties and training needs, then it may be essential to develop new training methods and procedures for them. However, if their skill deficits and training needs are highly similar to those characterizing other, more extensively researched groups of exceptional children, it seems most inefficient to

ignore methods and strategies developed for these groups which could, nevertheless, be quite appropriate for use with the LD. With this, it is clear that the implicit assumption of the uniqueness of the maladaptive behaviour of the LD warrants careful consideration since it bears heavily upon the efficiency and economy with which social skill training programs for the LD may be defined and prescribed.

A second point of considerable concern regarding this emerging field is the often reported empirical finding that the samples of LD children studied are heterogeneous with regard to their assessed social skills (e.g., Schumaker, Hazel, Sheldon & Sherman, 1982). If this population is, in fact, heterogeneous in terms of the social skill deficits its members display, then it seems inescapable that each treatment program offered must be tailored to the individual child's particular needs. Unfortunately, such an approach is not only very expensive, it also comes with few prospects of being delivered in a more economical manner. Under the current economic climate, and given the legions of children who apparently require such treatment (e.g., Schumaker et al., 1982), one must seriously question if such an approach is economically viable. Given this, it would seem that research seeking to identify groups of LD children with similar social skill training needs is urgently needed so the costs of social skill training programs can be reduced and treatment made available to greater numbers of these students.

#### Purpose of the Present Study

In general, the present study is concerned with the relationship between social skill deficits and learning disabilities. It has three major

goals. The first is to test the implicit assumption that the LD are unique in their maladaptive social behaviour. The second is to see if subgroups which have been shown to exist within the LD population do display characteristic patterns of social skill deficiencies. The third is to test the validity of the use of these subgroups for the purpose of social skill training. More specifically, this study will:

- a) test whether the LD do exhibit important differences in their social skill profiles and behavioural tendencies from slow learners and the behaviourally disordered;
- b) evaluate the extent to which three LD subtypes (i.e., distinct subgroups which have been identified in the LD population on the basis of the results they obtain on cognitive measures) exhibit subtype-specific deficits on several measures of social behaviour; and
- c) test the validity of these subtype groupings for the purpose of social skill training, and simultaneously probe into the nature of the training programs that may be suitable for each, by assessing their responses to brief social perception training programs which target their identified areas of cognitive strength and impairment.

## CHAPTER TWO

### REVIEW OF THE LITERATURE

The review of the relevant literature will be organized as follows. First, the manner in which social skills have been conceptualized and defined will be summarized with an emphasis upon the approach to social skill assessment employed in the present study. Next, research examining the social behaviour of the LD will be examined in some detail to: a) identify the more consistent sources of difficulty for these children in social exchange, b) identify those features of this body of research which could serve as sources for the heterogeneity of social deficits observed in the samples of LD children studied, and c) serve as a basis for comparisons between the LD and the other groups of exceptional students employed in the present study. In the following section, a number of explanations which have been advanced to account for the maladaptive social behaviour of the LD will be discussed. Next, the LD subtype classification literature will be reviewed and the LD subtypes selected for use in the present study identified. Social skill profiles will then be developed for each of the selected subtypes from their characteristic profiles of cognitive skills. These LD subtypes will then be discussed in terms of their 'fit' with the various explanations advanced for the maladaptive social behaviour of the LD, and also with reference to the heterogeneity of social skill deficits commonly found in LD samples. In the following sections, slow learners (SLs) and the behaviourally disordered (BD) will both be discussed regarding their suitability as comparison subjects, and social skill profiles will also be developed for



each from their profile of cognitive skills. Finally, the exploratory and experimental hypotheses of the present study will be detailed.

### Definition and Conceptualization of Social Skills

Considerable variability exists in the manner in which social skills have been conceptualized and defined (Gresham, 1981b). Some researchers (e.g., Foster & Ritchey, 1979; Libet & Lewinsohn, 1973) judge the skillfulness of a particular behaviour by the rather immediate consequences of its use in social exchange. Others (e.g., Asher, Oden & Gottman, 1977; Asher, Singleton, Tinsley & Hymel, 1979) have adopted a more global notion of social skill which assumes that the degree of a child's acceptance, as indicated by peer ratings on a sociometric survey, reflects the child's social skill level. Another group of researchers (e.g., Carlson, Lakey & Neeper, 1984; Gottman, Gonso & Rasmussen, 1975; Oden & Asher, 1977) focus primarily on a number of discrete categories of behaviour (i.e., communication, participation, co-operation and validation support) which are closely associated with peer acceptance.

This variability reveals that there is no universally accepted or over-arching definition of social skill (Gresham, 1981b). Nevertheless, there is an apparent consensus that social competence refers to a broad array of skills that facilitates interpersonal functioning (Deshler & Schumaker, 1983). Moreover, Schumaker and Hazel (1984a) have noted that this composite may include any cognitive function or overt behaviour in which an individual engages while interacting with another.

Gresham (1981a) advanced a conceptualization of social skills which is of particular interest to the present study in that it is directly related

to training. In this scheme, social skill deficits are conceptualized along three dimensions or 'domains'. The first, the skill domain, refers to a repertoire of basic cognitive and/or overt behaviours which are necessary for success in social interaction. Specific deficiencies along this domain are called 'skill deficits'. The second, the performance domain, refers to the execution of specific behaviours which have been shown to exist in the child's repertoire of skills. Deficiencies along this domain are called 'performance deficits'. The third, the self-control domain, refers essentially to the individual's ability to regulate his/her own behaviour. Deficiencies along this domain are called 'self-control deficits' and are characterized by the emission of high rates of socially adverse behaviours. Deficits of self-control are thought to frequently appear in individuals who display otherwise adequate social development (Gresham, 1981a).

A major advantage of Gresham's approach is that it not only forces the skill trainer to consider a behaviour of interest from several points of reference, but it also suggests that lower level social skills must be intact or established before work on higher level skills will be productive; and that different training techniques will be effective with different types of social skill problems. In particular, the approach suggests that deficits of the skill domain should be remediated through the use of techniques such as direct instruction, observational learning or modelling. In support of this, Stephens (1978) has shown that live modelling is especially useful for teaching new social behaviour in the classroom situation. Performance deficits, on the other hand, would be much more appropriately addressed through contingent reinforcement, since the goal of treating a

performance deficit is simply to alter the frequency of a behaviour which currently resides within the child's existing repertoire of skills. The work of Stephens (1978) also supports this suggestion in that reinforcement based techniques proved most effective in increasing and maintaining social skill levels once these skills had been established through modelling. Finally, Gresham's conceptualization suggests that training designed to enhance self-regulation would be a logical choice in the case of treating self-control deficits. In this regard, Meichenbaum (1977) and his associates (e.g., Meichenbaum & Goodman, 1971) have shown that a variety of techniques drawn from the cognitive behaviour modification literature, such as self-instruction and self-reinforcement, are of considerable use in remediating self-control deficits.

### The Social Behaviour of the LD

#### Interactions with Teachers

The LD child's relationship and interactions with his/her teacher warrant close attention for several reasons. First, by virtue of the time spent with their students, teachers are important agents of socialization in contemporary society. Second, teacher ratings have been shown to be both reliable and valid measures of childhood exceptionality (e.g., Bardon & Bennett, 1972; McCarthy & Paraskevopoulos, 1969; Swift & Spivak, 1969). Finally, the referral and placement of an LD child is often predicated on teacher concerns regarding the child's social behaviour (Ysseldyke, Algozzine & Epps, 1982).

With a few notable exceptions (e.g. Chapman, Larsen & Parker, 1979; Forness & Estveldt, 1975; McKinney, McClure & Feagans, 1982),

studies have shown that interactions between the LD student and teacher are comparable in frequency to those occurring between the normally achieving student and teacher (e.g., Bryan & Wheeler, 1972; Skrtic, 1980). However, there is some data to suggest that even in the face of comparable overall frequencies, the exchanges teachers have with these student groups may be qualitatively different. For example, Bryan (1974a) found that half of the time the teacher spent in interaction with the LD child was devoted to helping the child with academic work, whereas only one quarter of the time spent in interaction with the normally achieving child was in providing direct academic assistance. In Bryan's study, teacher involvement with the LD child was most likely to be in the form of assistance with arithmetic, while interaction with the normal child was likely to involve the child's running an errand. Chapman, Larsen & Parker (1979) report that both teacher- and student-initiated interactions were more likely to result in either praise or criticism for LD students than for their classmates. Bryan (1974a), on the other hand, found that positive evaluative remarks were evenly distributed between the LD and normal achievers, but that the LD child received more negative evaluative remarks from teachers.

#### Teacher Perceptions of the LD Child

Teacher perceptions of, and their attitudes towards LD students have been the subject of a fairly large body of research. In the main, this research indicates that teachers view LD students in a decidedly negative light (e.g., Bryan & McGrady, 1972; Keogh, Tchir & Windeguth - Behn, 1974). Often their unfavourable impressions of a child are established

during the first grade (Seamen, 1973). Empirical support for this general statement comes from research showing that the "LD" label, itself, carries negative connotations for teachers (Jacobs, 1978), and also the finding that teachers rate LD students as less preferred than nonlearning disabled (NLD) students in a Q sort procedure (Garrett & Crump, 1980).

More specifically, teachers see LD children as being less intelligent (Feagans & McKinney, 1981; McKinney & Foreman, 1982; Perlmutter, Crocker, Cordray & Garstick, 1983), less attentive, less able to organize themselves, less accepting of responsibility (Garrett & Crump, 1980), poorly self-disciplined (Keogh et al., 1974), less co-operative (Boersma & Chapman, 1978; Garrett & Crump, 1980; Myklebust, Boshes, Olson & Cole, 1969), less able to deal with new circumstances, less accepted socially, less tactful (Boersma & Chapman, 1978; Myklebust et al., 1969), less able to comprehend material, and poorer performers in general, than NLD children (Perlmutter et al., 1983). In addition, teachers have also been found to view LD students as more aggressive (Keogh et al., 1974; Perlmutter et al., 1983), more hyperactive (Garrett & Crump, 1980), more disruptive, more withdrawn, and more anxious than NLD students (Perlmutter et al., 1983).

Attentiveness may, in itself, be a factor contributing negatively in teacher evaluations of LD children, since inattention is easily interpreted as indicating disrespect. The findings concerning the attentiveness of the LD differ somewhat with the age of the children studied. During the elementary school years, the LD appear to be much less attentive than normally achieving students (Bryan, 1974a). By junior high school, LD students are reported to be as attentive as low achieving NLD students

(Deshler & Schumaker, 1983). However, Deshler, Wildgen & Sherman (1982) report that junior high school LD students are as attentive as normals only during preliminary instructions, but then tend to be significantly less attentive later, when the teacher provides additional content related information.

Consistent with the finding of improved attentiveness on the part of the older LD students, much more favourable teacher evaluations have been reported in the case of older LD students. For example, Deshler & Schumaker (1983) found that regular classroom teachers perceived junior high school LD students more favourably than low achieving NLD students in terms of: speaking courteously to the teacher; attending during lectures and discussions; asking for help when appropriate; getting along with authority figures; trying to improve when criticized; and also in their being appreciative of praise. Similarly, Skrtic (1980) found that senior high school teachers rated LD and normally achieving students comparably on measures of hyperactivity, defiance and dependency. From this, it appears that teacher impressions of the LD do, in fact, show a gradual improvement across the child's school years which coincides with an apparent improvement in the LD child's attentiveness.

Finally, the Skrtic (1980) study also sheds some light on the LD student's perception of his/her interactions and relationships with teachers. It demonstrated that, overall, the interactions between teacher and student were biased moderately in favour of LD students. Yet, the LD students perceived their teachers as directing significantly less approval and somewhat more disapproval towards them than their normally achieving classmates. This suggests that even as late as high

school, LD students are not only inaccurate in assessing their own relationships with others, but that they are also inaccurate in their evaluations of relationships between others.

To summarize, although there is some question regarding differences in the absolute frequency of teacher interactions with LD and normally achieving students, it does appear that the interactions between the LD student and teacher differ qualitatively from those occurring between the NLD student and teacher. Teacher exchanges with the LD are much more likely to be centered on academic content and punctuated by evaluative comments by the teacher; with the majority of these comments possibly being critical in nature. Thus, the LD child is much more likely to have his/her academic difficulties underscored through interaction with the teacher. At the same time, the LD child is much less likely to receive some form of preferential treatment, such as errand running, as a result of his/her exchanges with the teacher. In addition to this, there is likely to be some degree of inattention on the LD student's part either prior to and/or during these exchanges which may convey an attitude of disrespect for the teacher.

Adolescence appears to provide some improvements in the relationships between teachers and their LD students. However, the results presented indicate that LD adolescents remain less than accurate in their perception of their own relationships with their teachers, and also in their perception of the nature of relationships between others.

Teacher perceptions of, and their attitudes towards LD students, and particularly those in the elementary grades, are generally of a negative nature. This is of considerable concern given a) that the

teacher's expression of a negative attitude towards a child may adversely influence the child's social status (Lapp, 1957), and b) that significant positive relationships have been shown to exist between teacher preference and the LD child's social status (Garrett & Crump, 1980). In the main, then, it appears that the LD child's interaction with the teacher is likely to be unrewarding for both teacher and student. Moreover, there is reason for concern that the nature of their interaction may exert an adverse impact upon the child's personal and social adjustment.

### Interactions with Peers

A consensus in the literature is that the LD do not differ from normally achieving children in the frequency of their interactions with peers (e.g., Bryan, 1974a, Bryan & Wheeler, 1972, McKinney et al., 1982; Schumaker et al., 1982; Schumaker, Sheldon-Wildgen & Sherman, 1980). However, numerous studies have been reported which have found that exchanges involving LD children with their peers differ qualitatively from those occurring among normally achieving students.

Observational Studies. Despite the present day concerns regarding the social functioning of the LD, very few observational studies have been conducted to examine differences in the naturally occurring social behaviour of LD and normally achieving students. Two notable exceptions are studies conducted by Bryan and her associates which employed elementary school students. In the earlier study (Bryan, Wheeler, Felcan & Henek, 1976), it was found that LD children emitted significantly more competitive statements, but made significantly fewer statements and gestures of consideration, such as complimenting another, or signalling a



welcome for the peer to proceed first. In the second study (Bryan & Bryan, 1978), it was found that the LD tended to make more 'rejection' statements and 'very nasty' statements to others; and were more likely to be the recipients of 'very nasty' statements. LD children were also more likely to fail to respond to the initiations of others. In addition to this, these researchers also reported that the sex of the LD child influenced the communications received from others. In particular, LD males were the most likely to have peers fail to respond to their initiations, while the initiations of LD females were quite unlikely to be ignored. LD females were also distinguished by receiving the greatest number of 'mildly nasty' statements from others.

Schumaker, Sheldon-Wildgen & Sherman (1980) observed the social behaviour of LD adolescents in regular class settings and found no differences between LD students and normally achieving peers in the frequency with which they: a) initiated interactions with peers; b) were the targets of peer initiations; c) responded to peer initiations; or d) engaged in conversations with peers. These researchers also found that there were no significant differences between the LD and normally achieving groups regarding the number of different peers with whom each student interacted, and that peers did not tend to ignore the initiations of LD students.

From these observational studies, it does appear that the social interactions of LD students with their nonhandicapped peers are rather turbulent during the elementary grades, but that appreciable improvement may be apparent by junior high school. However, whether this improvement is due to selective attrition of LD students with time,

change in LD students over time, or increased tolerance on the part of nonhandicapped students with time, remains in question.

Studies Employing Contrived Situations. The majority of studies which have examined differences in the social behaviour of LD and NLD children have employed contrived situations. For example, Cosden, Bryan & Pearl (1982) used a study skills training session to compare the interactions of male and female dyads of normal children to dyads which were matched for sex, but included one normal and one LD child. In the first study, half of the dyad types were given instruction and incentives to study individually. The remaining dyads were instructed and encouraged to study co-operatively. Although all dyads engaged in more interactive behaviour under incentives for co-operation, dyads including an LD male engaged in co-operative efforts less than was true for dyads comprised of two NLD boys. In contrast to these findings with boys, the NLD partners of LD girls spent more time in interactive behaviour than was true for either partner in a NLD female dyad.

In the second study Cosden et al., (1982) report, half of the dyads who were given instruction and incentives to work co-operatively were also shown a video tape demonstrating co-operative study behaviour. The results revealed that the video taped presentation produced further enhancement of co-operative behaviour. This was particularly true in the case of female dyads with an LD member. However, male dyads containing an LD student were more likely to resist the partner's initiations.

A number of additional sex differences were also apparent in these studies. In the first study, LD girls tended to rate their partners' abilities higher than their own regardless of the prevailing treatment conditions. In addition to this, given co-operative study conditions, female subjects were much more likely to acknowledge their partner's efforts; and also much more likely to want to work with their partner again under similar circumstances than was true of girls who had been working under the individual study conditions. On the other hand, male subjects who had been working under the co-operative conditions of the first study, tended to rate their own abilities higher than those of their partner. In the second study, NLD boys rated their own ability higher than their partner's. Girls, on the other hand, were again more likely to acknowledge their partner's efforts after working under the co-operative study conditions. However, a participant's status as an LD or NLD subject did not appear to directly affect their partner's willingness to work with them under similar circumstances in the future.

Given the academic nature of the tasks employed in the Cosden et al. (1982) research and the disadvantage of LD students in this regard, their results suggest that LD girls may be somewhat more accurate than LD boys in assessing their actual capabilities with respect to NLD peers. They also suggest that LD girls may be much more perceptive of, and responsive to, the co-operative efforts of their peers. However, these particular differences appear to have little bearing on the willingness of a same-sex NLD peer to work with an LD child.

A study by Martino & Johnson (1971) examined the effects of co-operative learning conditions in a situation where the LD were not at a

distinct disadvantage due to their achievement difficulties. In this study, second and third grade boys attending a swimming class were assigned to a co-operative or an individual learning condition. Each LD child assigned to the co-operative condition was paired with a NLD subject. These paired children were then instructed to assist each other during the lesson and told that they would be evaluated as a pair following training. In contrast, children in the individual learning condition were not assigned partners. Rather, they were encouraged to interact with the instructor and were told that they would be evaluated on an individual basis. During a 15 minute free activity period following the lesson, more friendly interactions occurred between LD and NLD boys who had been assigned to the co-operative learning condition. Although this outcome suggests that co-operative learning conditions may have a positive impact upon interactions between LD and NLD boys, particularly in situations where the LD are not at a distinct disadvantage due to their academic difficulties, it is unclear whether the benefits observed were due to the co-operative learning conditions employed, or simply due to the pairing of subjects in the study.

Bryan & Pflaum (1978) had fourth and fifth grade LD and NLD students teach a game to a classmate and also to a kindergarten-age child. These researchers found that LD students provided classmates and kindergarten children with a similar degree of instruction on playing the game. NLD students, on the other hand, devoted a much higher proportion of their communications to instructions on playing the game when they were teaching the game to the younger children. These researchers also found that LD students tended to make more statements

which were misleading, or failed to provide clarification, than was true of NLD students. This was most pronounced in the case of white LD males in interaction with classmates, and white LD females when they were working with kindergarten children.

Bryan, Donahue & Pearl (1981) employed triads of third through eighth grade students, which were comprised of two NLD and one LD student, or three NLD students to study the communications of LD children during a small group problem solving task. In this study, each participant was given a list of potential presents for their class and then asked to independently rate the desirability of each present listed. Triads were then asked to arrive at a consensus on a particular gift from the list. The results revealed that the LD participated as actively as NLD subjects in the discussions which ensued. However, their contributions differed in several ways. In particular, LD subjects tended to respond more to requests for clarification and opinion than their NLD counterparts, but were less likely to disagree with the choices of the other members of their triad. In addition, they were less likely to maintain the speaker role or to try to keep the group focused upon the task at hand. Thus, although LD subjects participated actively, they did so in a deferential, unassertive manner. Not surprisingly, their preferred gift choices were less likely to achieve group consensus than those selected by NLD subjects.

As a follow-up to the preceding study, Bryan, Donahue, Pearl & Sturm (1981) had LD and NLD children serve as a "talk-show host" to see if LD children would be more assertive and active in maintaining a conversation if placed in a socially dominant role. The host child conducted a three minute interview with a NLD child on the topic of

television shows and movies. Several differences were found with LD and NLD hosts. First, LD hosts used fewer questions during their interviews. Second, a smaller proportion of their questions were of an open ended variety. Consequently, LD hosts were less successful in eliciting extended responses from interviewees. Third, the nonverbal behaviour of interviewees suggested that they were rather uncomfortable in being interviewed by LD hosts. This was particularly true in the case of female LD hosts and second grade LD hosts of either sex. Finally, interviewees were much more likely to take over the role of host when their host was an LD subject. From this, it was concluded that the LD are less skillful than NLD children in maintaining a conversation even when assigned responsibility for maintaining the conversation and placed in a socially dominant role.

In a subsequent study, Donahue & Bryan (1982) employed second through eighth grade boys and a similar talk-show format. However, before serving as a talk-show host, half of their subjects first listened to an audiotaped interview in which a number of interviewing techniques were employed. The remaining (control) children heard only an audiotaped monologue of the interviewee speaking the same topic. Thus, experimental and control subjects were equally familiar with the content of the recorded interview, but control subjects were not exposed to the conversational techniques modelled by the interviewer. During the "talk-show" interviews which followed, NLD children in the control condition spontaneously used more of the modelled techniques than their LD counterparts. However, LD subjects who were exposed to the interviewing techniques were as likely as their NLD counterparts to use

these techniques while playing the role of the talk show host. At the same time, though, the LD child's use of these techniques was associated with an increase in interviewee requests for clarification, and also a reduction in the elaborated responses offered by interviewees. With this, it was concluded: a) that the audiotaped interview likely served to cue LD subjects to use conversational techniques which were within their conversational repertoire, and b) that difficulties with content or phrasing, rather than the availability of suitable conversational techniques, may make effective communication difficult for the LD child to achieve.

Smiley & Bryan (1983b) videotaped groups of 10 LD and 10 NLD junior high school boys at a summer camp as each of these groups attempted to get all of its members standing upon a single tree stump. The analysis of the interactions which transpired during the task revealed that the LD group was more off-task, had more negative interactions and engaged in more nonproductive behaviour than the NLD group. Members of the NLD group spent more time than members of the LD group in talking simultaneously during the tasks. However, the NLD group also spent more time than the LD group in listening when a strategy was suggested; working through suggested strategies; and also in evaluating the strategies suggested.

Smiley & Bryan (1983a) videotaped groups consisting of two LD and two NLD junior high school boys during the construction of a raft from logs and twine. Their results revealed that NLD boys tended to work independently upon the raft while LD boys spent more time in working with others on the task. Nevertheless, NLD were much more supportive

and friendly in their conversations during their work than LD boys. In particular, they made more sociable statements which were unrelated to the task at hand, and offered more encouragement than LD subjects. LD subjects, on the other hand, tended to make negative comments both about group members and the assigned task.

Another study which employed a contrived situation to examine differences between the interactive behaviours of LD and normals was based upon the notion that peer popularity and rejection may be products of a child's use of social reinforcements, particularly praise and punishment (Bryan, 1974a). In this study, LD and NLD children served as tutors for younger children on a bowling game. The results revealed no significant differences between LD and comparison children in their use of social reinforcements. Surprisingly, though, when videotapes of these children in interaction were examined by naive judges; and each child was rated for: physical appearance, speech, language competence, academic achievement and attractiveness to other children; only ratings on physical appearance failed to differentiate the LD from the NLD children. From these results, it appears that many of the important differences between the social behaviour of LD and NLD children may be of a very subtle nature.

#### Sociometric Status of the LD

Studies which have examined the sociometric status of LD children in the elementary grades (e.g., Bruininks, 1978, Bryan, 1974, 1976; Garrett & Crump, 1980; Horowitz, 1981; Serafica & Harway, 1979; Scranton & Ryckman, 1979; Sipperstein, Bopp & Bak, 1978) are alike in finding LD



students less popular than their nonhandicapped peers. The unpopularity of LD students has been shown to persist over time (Bryan, 1976; Scranton & Ryckman, 1979) and across classrooms (Bryan, 1976). Poor sociometric status has been shown to be especially true for white LD females in that they are consistently rated much less favourably than white LD males or nonwhite LD children of either sex (Bryan, 1974, 1976; Scranton & Ryckman, 1979). Generally speaking, LD children not only receive fewer positive nominations in sociometric surveys, they also receive significantly more nominations of rejection than their NLD peers (Bryan, 1974; Scranton & Ryckman, 1979). Nonhandicapped children who receive positive sociometric nominations from LD students do not reciprocate positive nominations with the LD child (Hutton & Palo, 1976). Taken together, these results suggest that the LD are not seen as being socially desirable.

A rather complicated picture emerges from the research which probes into the views that NLD students have of their LD classmates. Bryan (1974) found that elementary school NLD students do not view their LD classmates as hyperactive, but tend to see them as being: worried and frightened, sad, untidy and unclean, rather unattractive, as individuals to whom no one pays much attention, and also as individuals who never have a good time. In contrast, research with adolescents shows that not all LD students are seen by their peers in such an unattractive light. For example, Perlmutter, et al., (1983) found that approximately 25% of their adolescent LD sample were, in fact, very well liked, and that many of the remaining LD subjects were neither actively liked or disliked by their NLD peers. Liked LD students in this study were much better able than

disliked students to predict how their peers in the mainstream would view them and were very well aware of their popularity. Disliked students, on the other hand, were quite oblivious to the very strong opinions others held of them.

In summary, the research focusing upon exchanges between the LD child and his/her NLD peers indicates that social relations are quite problematic for many LD individuals. Clearly, their exchanges in the elementary grades appear to be the most turbulent, but many of their social difficulties do appear to persist into junior high school and beyond. By and large, the LD are poorly accepted by their NLD peers who see them as troubled and unattractive. Despite this, though, the LD do not appear to be shy or socially reticent, since they engage in interaction with peers as frequently as is true of nonhandicapped students. However, the studies reviewed also reveal that the behaviours the LD employ in social exchange differ qualitatively from those used by their NLD peers. In group settings, the LD are less friendly, less encouraging and often less co-operative. As members of a group they are less influential, and the results of their group efforts are likely to be less productive. On an individual-to-individual basis, they seem unable to adapt their behaviour to meet the needs of the partner in social exchange. They also fail to appreciate the impact that their behaviour has upon another. In addition to this, they appear to be deficient in a number of skills which are important for effective communication; and often use language in a hostile and aggressive manner. Finally, they are less successful than their NLD peers in their use of techniques which facilitate social dialogue; and they seem largely unable to maintain an assigned socially dominant role.

Overall, the research reviewed suggests that the social world of the LD child is quite different from that of his/her NLD peers. Neither teachers nor peers appear to hold these children in a fond regard, and the LD child's social exchanges with members of these groups are rather unlikely to be satisfying for either party involved. While there is strong suggestion that the LD child's social relations may become more favourable with time, there is also evidence to suggest that social difficulties are likely to remain as significant problems for many of these individuals over time. In addition to this, there is also some reason for concern that the LD child's interactions with teachers may contribute adversely to the LD child's social adjustment.

#### Sources of Heterogeneity

The research reviewed regarding the social behaviour of the LD displays a number of features which could contribute to the heterogeneity of social skill deficits reported for these children. The first is the frequent failure to analyze results for sex differences. Studies which have separately analyzed results for males and females have shown that LD girls:

- a) are more insightful regarding their abilities relative to their peers (Cosden, Bryan & Pearl, 1983);
- b) more sensitive to the co-operative efforts of others (Cosen et al., 1983);
- c) provoke less extreme negative responses from others (Bryan & Bryan, 1978);
- d) are less ignored by others (Bryan & Bryan, 1978); and

- e) less able to adapt their communication to the attributes of the partner in social exchange (Bryan & Pflaum, 1978).

These findings underscore the importance of sex-differences and also hint that LD males and females may exhibit very different forms of social disability. In this regard, it is tempting to speculate that LD females may be less impaired than LD males in the accuracy of their perceptions of the 'other', but more socially encumbered than LD males by difficulties in using language in a socially competent manner.

Age differences are also likely to contribute to the heterogeneity observed in the social skill deficits of a randomly drawn sample of LD children. From the research reviewed, social relations for the LD students in the elementary grades appear to be quite hostile and aggressive (e.g., Bryan & Bryan, 1978). This suggests that deficits in the self-control domain may be a primary source of difficulty for preadolescent LD students. However, deficits in the skill and/or performance domains may represent more important sources of difficulty for the older LD individual (e.g., Deshler & Schumaker, 1983; Skritic, 1980).

Differences in the prevailing social context may also contribute to the heterogeneity of deficits observed. In particular, in highly structured social situations, the skill and performance deficits of the LD become quite apparent (e.g., Bryan, Donahue, Pearl & Sturm, 1981). The techniques which they employ are often used ineffectively, and other skills which they do possess are not used spontaneously (e.g., Donahue & Bryan, 1982). In less structured settings, such as during games in the gym, their deficiencies in the self-control domain are much more likely to be

observed (e.g. Bryan & Bryan, 1978; Bryan & Smiley, 1983a; 1983b). In addition, the research reviewed also suggests that the LD are likely to display differing social deficits if the prevailing context varies in the demands it makes of these children for competent verbal and nonverbal social behaviour.

From the foregoing, it is suggested that clusters of individuals displaying some degree of similarity in their profiles of social skill deficits might be identified within a large, randomly drawn sample of LD students through a procedure which successively subdivides the sample for each of these noted sources of heterogeneity. The first division in this regard would be between males and females. Next, elementary school aged children would be separated from adolescents and adults. These four subgroups would then be subdivided according to their difficulties in functioning well in structured and unstructured settings, and again, with respect to the difficulty they encounter in meeting demands for competent verbal and nonverbal social behaviour.

Clearly, the resulting 16 clusters could be of considerable interest from the point of view of economy in defining and delivering appropriate social skill training programs. However, what remains as an important question is whether the various explanations advanced to account for the social difficulties the LD encounter are able to link these sources of heterogeneity to learning problems.

### Explanations for the Social Difficulties of the LD

In the past, the maladaptive social behaviour of the LD was generally interpreted as a secondary result of academic failure (e.g., Black, 1974; Koppitz, 1971). However, this notion of a simple reactive disturbance has become increasingly questioned as data from empirical investigations into the social functioning of the LD accumulate, and a number of alternate explanations have emerged. Three of these, the Intrusiveness explanation, the Verbal Deficit explanation, and the Nonverbal Deficit explanation are of particular interest because each has the support of a substantial body of empirical data and together, they provide a reasonably comprehensive account of the data regarding the social behaviour of the LD. Each is discussed below.

#### Intrusiveness

The Intrusiveness explanation states that the LD are poorly accepted as a result of their tendency to initiate social exchange in an imposing or untimely manner (e.g., Bryan & Bryan, 1975; Bryan et al., 1976). One general example of the former is 'butting in' during intimate exchanges between others. An example of the latter is making comments which are grossly inappropriate for a given social situation. Several cognitive deficiencies commonly found in the LD seem most consistent with such a tendency. To elaborate, given the dynamic and reciprocal nature of social exchange (Hops & Greenwood, 1981), some appreciation of, and respect for the flow of events leading to the present moment are prerequisites for timely social initiations. In this regard, it would seem that children who are impaired in their ability to deal with sequentially

ordered information would tend to make social initiations which are unwelcomed because their initiations are unlikely to be in keeping with the preceding sequence of social events. The same should be true of children who are distractible or inattentive because they are less likely than their NLD peers to reliably monitor an on-going sequence of events; and also in the case of impulsive, poorly self-controlled children since they are less likely than their NLD peers to inhibit an impulse to initiate an exchange when the preceding sequence of events indicates that an initiation would not be welcomed. Thus, it seems reasonable to assume that children who tend to exhibit intrusive social behaviour may also be described as distractible, inattentive or impulsive. Furthermore, the social initiations of these children should lead to very similar consequences. In particular, their initiations are likely to be considered annoying and, over time, their initiations should frequently be ignored.

One of the most consistent findings of observational studies of the classroom, which is of particular relevance to the Intrusiveness explanation, is that the LD are more "off-task" or "distractible" than NLD children (Pearl, Bryan & Donahue, 1983). Moreover, Bryan & Bryan (1978) report that follow-up investigations have shown that poor task orientation persists from four to six years following formal identification of such a problem. This is supported by the work of Deshler & Schumaker (1983) and Skrtic (1980) which suggests that inattention becomes less pronounced in junior high and high school, respectively. From this, it does appear that the onset of adolescence is associated with a significant change in the on-task behaviour and attentiveness of many LD students.

Consistent with the foregoing, there is some evidence that the LD in the elementary grades are, in fact, more ignored than their NLD peers. For example, Bryan's (1974) NLD elementary school subjects characterized their LD peers as individuals whom "no one pays attention to", and elementary teachers were found to be much more likely to ignore the verbal initiations of LD than NLD children (Bryan, 1974a). However, sex differences appear to be an important factor in a child's being ignored. In particular, female LD students are quite unlikely to be ignored, but LD males are very likely to be ignored (Bryan & Bryan, 1978). In contrast, adolescent LD subjects do not appear to be more ignored than their NLD peers either in terms of the peer's response to the LD student's initiations, or in the frequency with which peers initiate exchanges with these LD students (Schumaker, Sheldon-Wildgen & Sherman, 1980). Importantly, attitudes towards the LD also follow a very similar progression in both teachers (e.g., Skrtic, 1980) and NLD classmates (e.g., Pearlmutter et al., 1983), with junior high school marking an appreciable improvement in the manner in which both teachers and classmates view the LD. However, some LD adolescents do appear to remain unpopular (Pearlmutter et al., 1983).

From the foregoing, it appears that task orientation is indeed linked to peer popularity and acceptance, and also the likelihood of being ignored. However, with this, it also appears that the Intrusiveness explanation may not apply well in the case of LD students who are beyond the elementary grades. The current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM III) (American Psychiatric Association, 1980) provides an account of this apparent discontinuity.



Attention Deficit Disorder. The DSM III (American Psychiatric Association, 1980) includes a condition called Attention Deficit Disorder (ADD) whose features and course are strikingly consistent with the data presented immediately above. To elaborate, ADD is a disorder which is usually first evident in childhood or adolescence, primarily affects males, and often includes hyperactivity. According to the work of Lufi & Cohen (1985), children diagnosed as ADD typically display a depressed 'Factor III' score on the WISC-R (i.e., the mean of Arithmetic, Digit Span and Coding subtests) (Kaufman, 1979), suggesting that a difficulty in dealing with ordered sequences may be a characteristic cognitive deficiency of these children. Nevertheless, the Manual offers that the primary features of the disorder are developmentally inappropriate inattention and impulsivity. However, only inattention is considered an invariant feature of the disorder (American Psychiatric Association, 1980).

With regard to course, two possibilities are noted for the inattention underlying the disorder. The first is chronic with the impairment of attention persisting into adulthood. In the second, inattention 'lifts' at puberty and takes with it most, if not all of the associated features which include: obstinance, stubbornness, negativity, mood lability, low frustration tolerance, temper outbursts, low self-esteem, lack of response to discipline, and impaired academic and social functioning. Finally, the major complications associated with the disorder are school failure, Conduct Disorder and Antisocial Personality Disorder (American Psychiatric Association, 1980).

Thus, the DSM III narrative concerning ADD provides appreciable support for the Intrusiveness explanation in: a) its use of many of the

terms commonly used to describe the behaviour of the LD, b) providing an account of the sex-linked differences in the social behaviour of the LD, and c) in accommodating the variability in the social functioning of these children under highly and loosely structured settings. In addition to this, it also extends the Intrusiveness explanation through: a) providing an account of the developmental progression of the social behaviour of the LD, b) in suggesting that a substantial number of LD children exhibiting social difficulties due to the intrusive quality of their behaviour may not require social skill training since ADD may remit spontaneously with the onset of adolescence, and c) forecasting that some children exhibiting intrusive social behaviour may be at risk for serious and chronic mental health difficulties which are highly resistant to conventional psychotherapeutic interventions.

### Verbal Deficit

Bryan & Pflaum (1978) hypothesized that the social problems experienced by the LD might be part of a disorder in one or more of the processes involved in understanding or using language which would serve to make interpersonal communication problematic for them. The DSM III (American Psychiatric Association, 1980) distinguishes between receptive and expressive developmental language disorders. In the former, both the comprehension (decoding) and vocal expression (encoding) of language are impaired. In the latter, the child's decoding skills appear relatively intact but language encoding is impaired. From the figures offered in the Manual, expressive disorders are twice as common as receptive disorders and appear in about 0.1% of the childhood population. Learning

impairment is cited as being frequently associated with expressive disorders and "invariably" present with receptive disorders.

Verbal Receptive. The LD are frequently described as poor in understanding orally presented information and directions. However, the empirical studies which have assessed global language comprehension in the LD population do not support this claim. For example, Donahue & Bryan (1983) found no differences between LD and NLD boys on the Clinical Evaluation of Language Functions (CELF) (Semel & Wiig, 1980) in language comprehension. Similarly, Pearl, Donahue & Bryan (1981) found that LD children had no difficulty in interpreting and responding to even indirect requests for clarification during a referential communication task. Another study (Donahue, Pearl & Bryan, 1980) found that LD students, in the main, were as skillful as normal children in recognizing ambiguous messages provided by an adult even though they were less likely to request clarification of such messages. Speckman (1981) reports that, as listeners, LD and normally achieving children followed directions equally well.

Despite these findings of comparability between LD and NLD children regarding their global comprehension of language, several investigators report finding relatively specific deficiencies in the receptive language skills of the LD. For example, Donahue & Bryan (1983), found that LD students were much less accomplished than NLD children in vocabulary development and that this deficiency was much more evident in older LD students. Several others, (e.g., Fry, Johnson & Muehl, 1970; Wiig & Semel, 1978) also report impaired vocabulary development in the LD. Wiig & Semel (1975) found that LD children

displayed significant problems in understanding and interpreting: prepositions, 'wh' questions, sentences with demonstrative pronouns, passive sentences, sentences expressing relationships between direct and indirect objects such as "mother showed the girl the baby", and sentences with negative clauses.

Other studies have shown that the conditions under which messages are presented may provide for greater decrements in the comprehension of LD than NLD children. Sabatino (1969), for example, found that when presented in noise, tasks requiring: the discrimination of words and speech sounds; the recall of digit sequences and sentences; the tapping of auditorily presented patterns; and the comprehension of stories all discriminated well between normals and children who had been diagnosed as having "minimal brain damage". However, under a noise-free presentation, the digit and tapping tests failed to do so. Rosenthal (1970) reported that LD children encounter disproportionate difficulty in processing spoken sentences when the sentences increase in complexity and syntactic compression. Wiig & Semel (1980) similarly found sentence complexity and rapid presentation disproportionately impaired the comprehension of LD students.

Taken together, these results suggest that the receptive language skills of the LD may be of a rather marginal nature. Under optimal presentation conditions, LD children appear to cope reasonably well, even in the face of numerous, rather specific deficiencies. However, under less than optimal conditions, they appear to be at a distinct disadvantage with respect to their nonhandicapped peers in terms of their receptive language skills.

Verbal Expressive. Investigations comparing the expressive language skills of LD and NLD children have shown differences both in the nature of the expressive language (linguistic structure) used by the LD and also in the manner in which the LD employ language in a variety of contexts (pragmatic competence). With regard to the former, Donahue & Bryan (1983) found that LD boys' scores on the language production subtest of the CELF (Semel & Wiig, 1983) were significantly lower than those earned by NLD boys. Denckla & Rudel (1976) found that LD children were inferior to nonhandicapped students in lexical retrieval. Several studies have shown that the LD are less able to accurately and fully communicate information to others (Banikowski, 1981; Noel, 1980; Speckman, 1981) and they have also been shown to be more ambiguous and irrelevant in their statements than NLD children (Speckman, 1981). In addition, the LD have also been shown to ask fewer questions in general (Bryan, Donahue, Pearl & Sturm, 1981) with open-ended, 'process' questions (Bryan et al., 1981), and requests for information (Donahue et al., 1980) reported as specific question types the LD are less likely to advance. In studies where questioning was comparable between groups, the questions of the LD were less productive in gathering relevant and necessary information (e.g., Speckman, 1981).

With regard to pragmatic competence, the LD, in general, appear to be deficient under conditions requiring diplomacy. For example, they have been shown to be inferior to normals in their ability to explain a problem (Mathews, Whang & Fawcett, 1982), in their skills of persuasion (Bryan et al., 1981; Donahue, 1981), in their ability to negotiate (Schumaker et al., 1982), in giving and accepting criticism (Mathews et

al., 1982; Schumaker et al., 1982), and also in resisting peer pressure (Schumaker et al., 1982). They are less tactful (Pearl et al., 1981a), less assertive (Bryan, Donahue & Pearl, 1981), tend to disagree and argue less (Bryan, Donahue & Pearl, 1981) and are less able than normals to maintain control in a conversation, even if assigned the role of an interviewer (Bryan et al., 1981). They tend to make more negative comments and statements, (Smiley & Bryan, 1983a; 1983b), more competitive statements (Bryan et al., 1976), and fewer positive statements (Schumaker, Hazel, Sherman & Sheldon, 1982; Smiley & Bryan, 1983a; 1983b). They may also make more rejection statements (Bryan & Bryan, 1978; Bryan et al., 1976) than nonhandicapped peers. Even in casual or potentially intimate situations, the LD appear to be at a disadvantage to normals in that their overall conversational skills are poorer (Mathews, et al., 1982; Schumaker et al., 1982). Specifically, they make fewer conversational statements (Smiley & Bryan, 1983a); fewer self-disclosing statements (Smiley & Bryan, 1983b); fail to appropriately adapt their conversation to the status and needs of their listener (Bryan & Pflaum, 1978; Donahue, 1981), and appear to have difficulty in playing an active role in a conversation (Bryan et al., 1981; Bryan, Donahue, Pearl & Herzog, 1981). Nevertheless, they do appear to be eager to fulfill conversational responsibilities if the context provides an obvious and linguistically undemanding means for doing so (Bryan et al., 1981; Donahue & Bryan, 1983).

Several studies have investigated the developmental progression of language in learning disabled and NLD children. For example, Wiig, Florence, Kutner, Sherman & Semel (1977) found that the order of difficulty in interpreting a variety of negated sentences was similar for

LD adolescents and normals. Wiig & Semel (1980) report that the order, in which the various rules are learned is similar between LD and nonhandicapped children. These studies are alike in showing that the LD exhibit a delayed onset and a slower rate of language acquisition than normals. A similar trend has also been reported by Lackner (1968 cited in Bloom & Lahey, 1978) and Evans & Hampson (1968 cited in Bloom & Lahey, 1978) who compared normals and mentally retarded children.

Given the foregoing, it has been suggested that the LD child's productive language deficits may be significant enough to interfere with even the informal conversations characteristic of talk among peers and family members (Donahue, Bryan & Pearl, 1982). Thus, there is good reason to suspect that language-based difficulties, both receptive and expressive, may contribute substantially to the difficulties a LD child encounters in the social exchange. In addition, there is also reason to believe that the LD may have a number of language-based difficulties in common with the mentally retarded.

The Verbal Deficit explanations are able to provide some account for most of the sources of heterogeneity noted earlier. First, a difficulty in language use likely represents a more flagrant departure from the social stereotype of females than of males. Accordingly, verbal deficiencies are likely to be more socially encumbering for LD females than LD males. Second, the fact that the LD seem quite willing to engage in conversations when the setting is linguistically undemanding (e.g., Bryan et al., 1981; Donahue & Bryan, 1983), but are disproportionately hampered under demanding conditions (e.g., Bryan, Donahue, Pearl & Strum, 1981; Schumaker et al., 1982), or conditions that are less than

optimal for verbal communication (e.g., Sabatino, 1969; Rosenthal, 1970; Wiig & Semel, 1980) provides an account of the social skill heterogeneity associated with structured and unstructured settings. Finally, children encumbered by receptive and/or expressive language deficits should function much less successfully in social situations requiring competent verbal, as opposed to competent nonverbal behaviour.

### Nonverbal Deficit

Nonverbal communication has been defined to include facial expressions, hand and arm gestures, postures, positions and various movements of the body or legs and feet (Mehrabian, 1972). Unlike verbal behaviour, nonverbal behaviour does not have well defined rules or syntax, nor is it explicitly taught to children in this culture. Furthermore, the developmental sequence in which children come to comprehend and enact nonverbal behaviour remains largely unstudied (Bryan, 1977). Consequently, children having difficulties in communicating nonverbally are likely to be at a substantial and chronic disadvantage in the social realm because corrective feedback is most unlikely to be provided.

Nonverbal Receptive. This deficit category is represented well in the learning disability literature by research addressing the so-called 'social perception deficit' explanation of the maladaptive social behaviour of the LD. This explanation maintains that the social functioning of the LD is problematic largely due to impaired visual-perceptual abilities which result in the LD child's misperceiving or misreading social exchange (e.g., Pearl, Bryan & Donahue, 1983). According to Gresham's



conceptualization, this explanation attributes the maladaptive social behaviour of the LD primarily to deficits in the skill domain.

To study the social perception skills of the LD, Bryan (1977) compared LD and normal achievers on an abbreviated version of the PONS test (Rosenthal et al., 1979) and contrasted their relative accuracies in discriminating various affective states displayed by others. The PONS consists of a 220 item film and synchronized audiotape in which an adult female expresses either positive or negative affects combined with dominant or submissive expressions. Besides varying affects and styles of expressions, the amount of information available to the subject is also varied through three visual channels (face, body, and face and body) and two voice channels (scrambled speech and electronically filtered speech). The subject indicates which of two experimenter-provided statements best describes each scenario. A buzzing sound prior to each scenario summons the subject to attend.

Bryan's results, which were based on a total of 40 test items and two visual (face, body) and both voice channels revealed that, overall, the LD were less proficient than normal achievers in comprehending visually and orally presented nonverbal, affective information. The LD subjects were at their greatest disadvantage in comprehending nonverbal communication transmitted by tone of voice and body postures.

Thomas (1979) essentially replicated Bryan's study in an experiment employing both male and female LD and control subjects. No sex differences were obtained but LD subjects again performed significantly worse than controls. Stone & Greca (1984) also replicated the Bryan (1977) study using incentives to increase attending behaviour. Under

incentives to attend, LD children displayed nonverbal comprehension comparable to normals. Importantly, while nonverbal comprehension scores were found to be related to intelligence and achievement, they were unrelated to other measures of social competence. In this regard, and despite comparable nonverbal comprehension results, LD children were found to be more anxious and withdrawn on a teacher-completed inventory, and judged to be significantly less socially skilled in a role-play task than comparison subjects.

Puckett (1980) also employed a modified version of the PONS in a study which included groups of academically talented students, normals and LD subjects. The obtained results found academically talented subjects superior to normals in their ability to identify emotional cues. The normals, in turn, were superior to the LD subjects.

Axelrod (1982) found that LD adolescents were inferior to normal controls in their visual modality results on the PONS test. However, they performed comparably to normal subjects on the auditory portion of the test. This suggests that attention related factors were not responsible for the inferior LD performance on the visual items. Additionally, Axelrod found that teacher ratings of social perception skill correlated well with the obtained PONS results and also with an additional paper and pencil measure of nonverbal social perception.

Emery (1975) presented LD subjects and controls with a motion picture of two cartoon faces drawn to represent happy, sad, angry and neutral affect. In one half of the films, one of the cartoon faces underwent a transformation of expression during a "social encounter". LD students were found to be inferior to controls in correctly identifying the

emotions depicted. Similarly, when Budreck (1976) presented a series of still photographs containing various emotional displays to groups of LD and normal achievers, LD subjects were found to make significantly fewer correct interpretations than control subjects.

Bachara (1976) administered the Borke Scales of Empathy (Borke, 1976) to 50 male LD subjects and 50 controls matched for age, race, sex and geographic location. These scales consist of 16 stories which are presented either auditorily or with accompanying pictures. Following a presentation of each story, subjects are required to choose, from four alternatives, a face depicting an emotion displayed by the main character. LD subjects made significantly more errors in identifying the appropriate face than controls.

Wiig & Harris (1974) had LD and normal adolescents view a videotape in which a young female displayed nonverbal expressions of: anger, embarrassment, fear, frustration, joy and love. The results showed that LD subjects made more errors than the control subjects in labelling the female's emotions, and that the errors made by LD subjects were of a more blatant nature than errors made by controls. For example, the LD were apt to label positive emotions (as rated by a panel of judges) to be negative in nature. Controls, on the other hand, were more likely to confuse affects which were closely related. These researchers also found that special education teachers rated subjects who scored in the lower half of the distribution on the nonverbal test as poor in adaptive social behaviour in the classroom.

Pearl & Cosden (1982) presented short segments from soap operas to LD subjects and normal controls in which subtle emotional and social

relationships between characters were depicted. After each segment, subjects were questioned, in a multiple choice format, to determine their comprehension of the scenarios. The questions required the children to make inferences: a) about the feelings of the characters in each segment, b) the social context in which the characters were engaged, and c) the intentions behind the characters' behaviour. However, the questions employed could be answered by a nonverbal response. The results of the study showed that the LD were consistently less accurate than the normal group in their understanding of the social interactions presented.

This study is important in that information was simultaneously presented in both the visual and auditory modes and the scenarios represent a reasonable approximation to the richness and complexity of natural social encounters. Nevertheless, differences in attention and the subject's comprehension of the test questions remain as plausible alternative explanations for the obtained results.

In a study designed to examine social perceptual skills, Bruno (1981) compared LD students with normally achieving peers on the Test of Social Inference (TSI) (Edmonson, DeJung & Leland, 1974). This instrument calls for interpretations of visual social cues which are presented in a series of pictures depicting various social situations. The instrument is based upon the assumption that subjects high in social inference ability will be able to infer many dimensions in the situations depicted, fully make sense of the situations, and respond appropriately. Conversely, subjects who are relatively low in this skill might partially perceive or misinterpret the situations and respond inappropriately. Each of the 30 items comprising the test is accompanied by standard questions which are presented

verbally by the examiner and require a verbal response by the subject. Bruno (1981) found that LD children not only showed deficits in interpreting the TSI items, but also in determining the consequences of the pictorially presented situations. However, the fact that the LD children performed comparably to normals in reporting the situational antecedents argues, to some extent, against the obtained differences being attributable to expressive language skills. Nevertheless, Bruno acknowledges that given the nature of the stimuli employed and the nature of the antecedent task, that attention related factors, rather than nonverbal deficits could account for the obtained results.

Gerber & Zinkgraf (1982) compared matched groups of LD and nonhandicapped children of two age levels (7 to 8 years and 10 to 11 years of age) on the TSI. Their results revealed that LD children were inferior to same age controls across both age groups employed, and that the performance levels of older LD subjects were comparable to those of the younger control subjects. This was interpreted as evidence of a developmental lag in the nonverbal social perception of LD students. Unfortunately, no procedures were invoked to assess or control for attention or language differences.

Maitland (1977) presented videotaped sequences of emotional displays to groups of LD, emotionally disturbed (ED) and normals at two age levels, 7 to 10 years, and 12 to 16 years. The sequences were shown under three conditions: a) auditory cues alone, b) visual cues alone and c) auditory plus visual cues. The results revealed that normals were significantly better than LD or ED groups in identifying the emotions depicted when the sequences were presented through isolated perception

channels. However, when the sequences were presented in both channels simultaneously, no significant differences between groups were obtained.

Maheady, Maitland & Sainato (cited in Maheady & Maitland, 1982), asked homeroom teachers of LD, socially/emotionally disturbed, educable mentally retarded, and nondisabled children at two age levels (CA 7-0 to 11-11 and CA 13-0 to 17-11) to complete inventories on these students to rate the frequency of 12 specific behaviours which are commonly associated with social perception deficits. The most striking finding of the study was that the targetted behaviours were displayed relatively infrequently in normals, but with similar elevated frequencies by socially/emotionally disturbed and educable mentally retarded, as well as learning disabled children.

Despite its extensive use of rather artificial stimulus materials and frequent failures to control for attention, language-based differences between the subject groups, and the use of language-based problem solving strategies, this body of research suggests that the LD are deficient in a number of important aspects of nonverbal perception. Some of these difficulties appear to be rather marginal in nature, and only apparent under less than optimal conditions. Others seem to be quite pronounced and place the LD child at a disadvantage of several years with respect to NLD peers. These results also suggest that other groups of exceptional students may be similarly encumbered by nonverbal social perception deficits, and that social perception ability may be related to intelligence.

Nonverbal Expressive. Bryan, Sherman & Fisher (1980) found, that within a dyadic interview, LD boys tended to smile less, spend less time

looking at the interviewer, and use more filled pauses than nondisabled boys. These researchers suggested that nonverbal behaviour of this nature could make the child appear relatively shy, indifferent or uninvolved. They also speculated that these characteristics could prompt negative evaluations by others. Consistent with this, Bryan & Sherman (1980) found that nonverbal behaviours did contribute to an observer's immediate impression of a child (whether LD or normal) and that nonverbal ingratiation attempts of LD boys were viewed as more socially offensive than the ingratiation attempts of normal achievers. Bryan and Perlmutter (1979) also reported that nonverbal behaviour of LD children prompted negative impressions in adult female observers. Importantly, these negative impressions do not appear to be products of the child's physical appearance since naive judges find the LD as physically attractive as NLD children (Hartup, Glazer & Charlesworth, 1967).

Raskin, Drew and Regan (1983) completed a very detailed study of nonverbal signals emitted by LD boys in an attempt to identify specific signals that may elicit negative impressions in others, thereby contributing to the LD child's social rejection. Additionally, these researchers sought to determine if the nonverbal behaviours of LD children displaying significant social/behaviour problems would differ from the nonverbal behaviours of controls or LD boys without such problems. Each child in the study was interviewed individually, with the interview lasting approximately four minutes and structured around a story the child had written for the examiner one week earlier. A prescribed filming sequence was followed throughout the interview. The child remained seated, facing the interviewer. The child's nonverbal

behaviour was later sampled from the film and analyzed for 31 different categories of behaviour. The results showed that only 'forward body-lean' clearly differentiated the normal achievers from the LD and social/behaviour problem LD boys. However, the LD groups did not differ on this measure. The authors acknowledge that the rigid structure, extreme brevity, and the many restrictions placed upon the child's movement by the filming and seating arrangements adopted for the study may have minimized the opportunity for differences between the groups to appear.

Cemark, Coster & Drake (1980) examined the gestural abilities of LD and normally achieving peers. They found LD boys inferior in their performance of gestural representations, and inclined to make more spacial errors while imitating gestures. Similarly, Allen & Atkinson (1978) found that high-achieving students were superior to low-achieving students in their ability to convey nonverbal information even when both groups understood the task demands equally well. This suggests that nonverbal expressive abilities may also be closely related to intelligence.

With the exception of a single study (Ackerman, Elardo & Dykman, 1979), the LD have been shown, across a wide variety of studies (e.g. Bruck & Herbert, 1982; Dickerstein & Warren, 1980; Horowitz, 1981; Wong & Wang, 1980), to be significantly poorer than peers on role-taking tasks. This consistency may indicate that role-taking in the social sphere is analogous to written work in the academic realm--one's deficiencies accumulate in the complexity of the task. However, the extent to which role-taking deficits reflect impaired social functioning remains largely in question since only the Bruck & Herbert (1982) study attempted (but



failed) to relate role-taking performances to parents' and teachers' ratings of social behaviour.

Whereas nonverbal social perception deficits have been shown to be related to a variety of functional measures of the child's social skill and difficulties, nonverbal encoding deficits have only been shown to be related to the rather immediate impressions that the LD child makes upon adults observing the child in interaction with peers, and upon adults engaged in interaction with the LD child. Given this, and despite the fact that first impressions tend to be durable (Gottlieb, Semmel & Veldman, 1978), it seems reasonable to assume that nonverbal receptive deficits may be more socially debilitating than nonverbal expressive deficits. However, it is conceivable that the LD child's nonverbal expressive deficits may set the stage for unfavourable relationships with others.

With regard to the noted sources of heterogeneity, the Nonverbal Deficit explanation does not seem to account for improvements in the social relations of the LD which coincide with the onset of adolescence. Moreover, empirical investigations have not found appreciable male-female differences in the nonverbal deficits of the LD (e.g., Thomas, 1979), despite the fact that sex-related social difficulties are commonly reported in the LD population (e.g., Bryan & Bryan, 1978; Bryan & Pflaum, 1978; Cosden, Bryan & Pearl, 1982). Finally, differences in the social functioning of the LD under highly structured and unstructured settings are also poorly accommodated by this explanation. Nevertheless, the Nonverbal Deficit explanation predicts that children encumbered by nonverbal deficits will function much less successfully in situations requiring competent nonverbal as opposed to competent verbal behaviour;

and that the LD individual's difficulties in this regard are likely to be chronic, since he/she is most unlikely to be provided corrective feedback (Mehrabian, 1972).

To summarize, a number of explanations have recently been advanced to account for the maladaptive social behaviour of the LD. Of these, three are of particular interest to the present study. The first, the Intrusiveness explanation assumes that the maladaptive social behaviour of the LD is due to their impaired ability to inhibit impulse, or reliably monitor on-going events, or efficiently process sequentially ordered events; with the net result that their social behaviour is untimely, imposing or intrusive in nature, and therefore unwelcomed. The Verbal Deficit explanation holds that receptive and/or expressive language-based deficiencies underlie the LD child's maladaptive social behaviour through hampering his/her ability to communicate with others efficiently and effectively. The Nonverbal Deficit explanation maintains that the problematic social behaviour of the LD child arises as a result of his/her difficulties in understanding the nonverbal displays of others, and/or difficulties in expressing himself/herself nonverbally in a manner which is intelligible to, or considered acceptable by others. Together, these explanations provide a reasonably comprehensive account of the most consistent findings of studies which have examined the social behaviour of the LD. Given this complementarity, it is tempting to speculate that these explanations may suggest three different subgroups of socially disabled children in the LD population.

## Learning Disability Subtypes

### The Clinical-Inferential Approach to LD Subtype Classification

The initial efforts to define homogeneous subgroups of LD children employed what has come to be known as a clinical-inferential approach to classification. This method involves assigning children to one of a number of possible categories on the basis of a visual match of their pattern of deficits across a battery of diagnostic tests (Satz & Morris, 1980). The studies employing this methodology tend to converge in their characterization of two LD subtypes and offer strong suggestion of the existence and nature of a third subtype as well.

The first, and the largest of the subtypes identified under the clinical-inferential approach, represents approximately 15% of all reading clinic referrals. It is comprised of children exhibiting reading problems due to marked deficiencies in the skills necessary for phonetic analysis and synthesis of words. Typically, these skill deficiencies were attributed to some form of language-based impairment or language retardation (e.g., Bannatyne, 1966; Denkla, 1972; Kinsbourne & Warrington, 1963; 1966; Mattis, French & Rapin, 1975).

The second LD subtype consistently identified in clinical-inferential studies may represent as few as 5% of all reading clinic referrals. It is comprised of children who were believed to have some impairment of their visual-perceptual abilities since they seemed unable to perceive written words as visual gestalts (e.g., Boder, 1973; Denkla, 1972; Johnson & Myklebust, 1967; Mattis, French & Rapin, 1975).

The third subtype which appears relatively frequently in the clinical-inferential literature exhibits a mixture of the academic skill

deficiencies of the language impaired and visual-perceptual disorder subtypes (e.g., Boder, 1973) and may be intermediate in size to these subtypes. It is comprised of children who are without marked language or visual-perceptual impairment, but who often exhibit motoric difficulties suggestive of neurological abnormality (e.g., Denkla, 1972). They also tend to be disorganized and distractible (Vance, Wallbrown & Blaha, 1978; Wallbrown, Vance & Blaha, 1979) and to possess poor impulse control (e.g., Denkla, 1972). Finally, it is also suggested that children of this 'mixed' subtype often encounter difficulty on most of the WISC-R Factor III subtests (e.g., Vance et al., 1978; Wallbrown et al., 1979).

The clinical-inferential studies provide some suggestion of a number of additional features which may also serve to differentiate these subtypes. First, females appear to be well represented only in the visual-perceptual disorder subtype (Denkla, 1972). Second, language-disorder subtype children tend to have higher Performance than Verbal IQs, while the reverse is true for visual-perceptual disorder children (Denkla, 1972; Ingram, 1970; Kinsbourne & Warrington, 1963; 1966). Third, each of these subtypes appears to exhibit some unique behavioural tendencies and social or emotional adjustment problems (Boder, 1973; Denkla, 1972; Wallbrown et al., 1978; Vance et al., 1979). Finally, the different subtypes appear to encounter characteristic patterns of academic difficulties (e.g., Boder, 1973; Vance et al., 1978; Wallbrown et al., 1979); differing degrees of academic impairment (Boder, 1973; Vance et al., 1978; Wallbrown et al., 1979); and differ in their prognoses for successful academic remediation (Vance et al., 1978; Wallbrown et al., 1979).

### Limitations of the Clinical-Inferential LD Classification Literature

Unfortunately, the clinical inferential studies are subject to a number of important limitations. First, the approach relies upon a priori criteria and the visual matching of children across multiple measures (Satz & Morris, 1980). As a result, the subtypes defined may reflect preconceived notions rather than data based differences; and the number and reliability of the subtypes defined both remain open to question. Second, rare, but relatively pure subtypes are unlikely to be identified, and disproportionately large "mixed" or "unclassified" categories are likely to emerge. Third, the subjects studied were typically reading clinic referrals, and the assessment batteries employed were generally of a very limited scope. This would tend to exert a significant influence upon the number of subtypes identified and would also provide a very narrow view of the subtypes which are identified. Finally, only a few attempts (e.g., Aaron, 1978; Mattis, 1978; Obrzut, 1979; Wiig, LaPoint & Semel, 1977) have been made to validate the subtypes identified under the clinical-inferential approach.

### Empirical LD Subtype Classification Studies

At the present time, the most compelling evidence for a multiplicity of causes of learning disability and the existence of distinct LD subtypes, comes from studies that have used empirical classification techniques to subdivide heterogeneous samples of disabled learners into a number of relatively homogeneous groups based upon their obtained pattern of performance across multivariate sets of data (McKinney, 1984).

While the clinical-inferential literature suggests that the LD

population likely includes three distinct LD subtypes, the empirical classification literature indicates that six and possibly more distinct subtypes can be identified within this population on the basis of their obtained results on a battery of neuropsychological tests (e.g. Fisk & Rourke, 1979; Lyon & Watson, 1981; Petrauskas & Rourke, 1979; Satz & Morris, 1980a; 1980b). Nevertheless, the essential findings of the clinical-inferential studies are well preserved in this literature. To elaborate, the 'language', 'visual-perceptual' and 'mixed' subtypes are all represented in the empirical classification studies (e.g., Lyon & Watson, 1981; Petrauskas & Rourke, 1979; Satz & Morris, 1980a). However, the empirical research strongly suggests that the first of these subgroups may, in fact, comprise two smaller subtypes--one whose members display relatively pervasive language impairment, and a second, which is modestly smaller in size, whose members display much more circumscribed language-based difficulties (e.g., Lyon & Watson, 1981; Petrauskas & Rourke, 1979; Satz & Morris, 1980a). In addition to this, the empirical studies are also consistent with the clinical-inferential literature in terms of the relative frequency with which language-based subtypes and visual-perceptual disorder subtypes appear in the LD population. However, the two bodies of research disagree regarding the frequency of 'mixed' subtype children. Here, it would appear that children placed in the additional categories available under the empirical methods are drawn heavily from those cases which are labelled as 'mixed' or which remain as 'unclassified' under the clinical inferential approach.

The most consistently appearing additional subtype in the empirical research is comprised of children who obtain a normal diagnostic profile

in the face of appreciable deficits on academic measures (e.g., Lyon & Watson, 1981; Satz & Morris, 1980a; 1980b; Petrauskas & Rourke, 1979). This finding raises some question regarding the appropriateness of the LD diagnosis given to such children. However, it may also indicate a) that the assessment batteries used by the empirical classification researchers were also too limited in scope to subtype all of the cases studied, or b) that psychoneurological deficits are not invariably associated with academic learning disabilities, as is implied by the DSM III (American Psychiatric Association, 1980).

Two additional subtypes are suggested by these empirical studies. The first is represented by children who demonstrate impairment on sequencing tasks (e.g., Lyon & Watson, 1981; Petrauskas & Rourke, 1979). Its members customarily display at least moderate levels of academic impairment with respect to the other subtypes identified. The second subtype is characterized by marked impairment on finger-localization tasks (e.g., Fisk & Rourke, 1979; Petrauskas & Rourke, 1979). Its members tend to show sequencing difficulties and also some additional impairment on verbal tasks. While sequencing difficulties have been reported independently of other notable deficits (e.g., Lyon & Watson, 1981), impaired finger-localization performances have only been reported in association with notable verbal and sequencing deficits (e.g., Petrauskas & Rourke, 1979; Fisk & Rourke, 1979). Consequently, the independence of the finger-localization group remains in question, and at present, these children are likely best considered as belonging to a 'mixed' group. Finally, it is of interest to note that there is some suggestion of a developmental progression in at least one subtype showing a sequencing

deficit (Fisk & Rourke, 1979), and that subtypes displaying sequencing deficits tend to be disproportionately male in membership (McKinney, 1984; Petrauskas & Rourke, 1979).

The empirical studies also corroborate, as well as extend a number of the suggestions made by the clinical-inferential studies regarding differences between the LD subtypes. In particular, these studies show that:

- a) subtype membership is not evenly nor proportionately distributed between the sexes; and that some subtypes are comprised almost exclusively of males (e.g., McKinney, 1984; Petrauskas & Rourke, 1979);
- b) identified subtypes do share fairly characteristic patterns of academic difficulty (Doehring & Hoshko, 1977; McKinney, 1984);
- c) a depressed Performance IQ is useful as a measure to identify visual-perceptual disorder subtype children (McKinney, 1984; Satz & Morris, 1980a);
- d) a depressed Verbal IQ is a very useful measure to identify the pervasive, 'global' language impairment subtype children (Fisk & Rourke, 1979; Petrauskas & Rourke, 1979);
- e) members of the most extroverted of LD subtypes tend not to obtain appreciable Verbal-Performance IQ discrepancies (McKinney, 1984);
- f) subtypes whose members display depressed Verbal IQs generally obtain poorer teacher-completed behavioural ratings than is true of subtypes whose members obtain depressed Performance IQs (McKinney, 1984); and finally,
- g) a general depression of the Factor III (Kaufman, 1979) subtests of



the WISC-R (Wechsler, 1974) is probably useful as a measure to identify LD subtype children who encounter appreciable difficulties on sequencing tasks (e.g., Petruskas & Rourke, 1979).

### The Limitations and Advantages of the Empirical Approach

Clearly the scope of the assessment batteries employed in this body of research is of some concern since the subtypes identified are a direct reflection of the behaviours and attributes sampled, and this research itself suggests that its assessment batteries may have, in fact, been too narrow in scope. Secondly, researchers in this area have used 'processing' assessment instruments extensively despite the fact that much criticism has been made of the reliability of the vast majority of these measures (e.g., Arter & Jenkins, 1979; Salvia & Ysseldyke, 1978). In addition to this, and related to its restricted scope of assessment, the empirical classification research can also be criticized for its very limited use of behavioural and adjustment measures.

Another broad area open to criticism involves the samples employed. The first point of concern is that in such research, the samples employed must be large if rare subtypes are to be identified. However, some of these studies (e.g., Doehring & Hoshko, 1977; Doehring, Hoshko & Bryans, 1979; McKinney, 1984) report using fewer than 100 subjects. A second is that the majority of its samples were clinic referrals. As with the clinical-inferential literature, this could serve to confound the obtained results with socioeconomic factors. Sampling in the empirical research can also be criticized for its limited inclusion of additional categories of exceptional students, and also for its limited monitoring of

samples over time. Clearly, the persistence and change of particular subtypes over time may provide insights and clues critical to accurate identification and effective treatment. Finally, while the clinical-inferential literature can be criticized for its absence of statistical rigor, the empirical methods are not strictly based upon probability either, since they do require some use of clinical judgment, despite the fact that decision rules and guidance functions are employed to minimize the bias that such judgments could introduce (McKinney, 1984).

The foregoing notwithstanding, the empirical methods represent a significant advance over clinical-inferential classification. As a body of research, it provides a much clearer, more detailed and more reliable picture of the various subtypes contained within the LD population. Moreover, approximately one half of the empirical studies reported offer validation data. Finally, the empirical methods appear to reduce the number of children who remain 'unclassified' or poorly classified under the clinical-inferential approach, and the different methods of analysis employed in the empirical classification research have been shown to produce very similar subtypes.

#### LD Subtypes Selected for Use in the Present Study

Three different LD subtypes were selected for use in the present study. The first (subtype I), comprises children who are characterized by global verbal impairment. The second (subtype II) is represented by children showing a general impairment of their nonverbal abilities. The third (subtype III) comprises children whose verbal and nonverbal skills are intact, but who are impulsive and distractible, and tend to score poorly on

sequencing tasks, and tasks requiring sustained attention. The rationale for selecting these specific subtypes and the manner in which they were identified rests upon a number of empirical, theoretical and practical considerations.

With regard to empirical considerations, the clinical-inferential and empirical classification literatures concur on the existence of three distinct subtypes within the LD population: a global language impairment subtype, a visual-perceptual disorder subtype, and a 'mixed' or impulsive-inattentive subtype who perform poorly on sequencing tasks. Moreover, these literatures also indicate that these subtypes may be reliably identified by depressed Verbal IQs, Performance IQs, and Factor III scores, respectively, on the WISC-R.

The theoretical foundations for their selection rest with the fact that these subtype divisions parallel the very well researched factor structure of the WISC-R (Kaufman, 1979). This provides an opportunity to explore the extent to which cognitive differences between the subtypes may account for their subtype specific behavioural tendencies. Furthermore, since the statistical parameters of these factors are well documented (Kaufman, 1979), the use of WISC-R results to subtype LD children provides a means to insure that the children selected are accurately identified as to subtype membership, and that the subtypes employed are suitably separated and nonoverlapping. Finally, the use of the WISC-R also provides a means to subtype LD children without restricting the sample under study to a specific form of academic impairment as is the case, for example, when Boder's (1973) classification procedure is used.

Finally, the accessibility of WISC-R results was a major pragmatic consideration. In this country, the WISC-R is almost invariably included as a component of an in-school psychoeducational assessment battery; and schools are required to insure that these results are updated regularly. This, combined with the universal requirement of demonstrated competence in the administration of the WISC-R, virtually ensured that such results on the population of interest would be widely available, relatively current, and gathered in advance by qualified examiners.

#### Expected Social Skill Profiles of the Selected LD Subtypes

From a consideration of their cognitive assets and liabilities, these subtypes seem likely to present striking differences in their profiles of social skills and deficits, and also in their social skill training needs. To elaborate, subtype I children are at their greatest disadvantage with respect to the other subtypes and normals in social learning and social exchange where the verbal medium is emphasized due to a general impairment of their verbal abilities. Accordingly, they are likely to display many deficiencies in their verbal social behaviour which would be logical targets for skill training. Moreover, with such an impairment, logical-deductive reasoning, and particularly that which is self-generated, seems rather unlikely to contribute heavily to the regulation of such a child's social behaviour because logical-deductive reasoning is essentially a language based skill (Paivio, 1971). Thus, the type I child should also be inclined to display impulsive and poorly self-regulated social behaviour. Consequently, they may also require self-control training. Nevertheless, social learning and exchange involving the nonverbal medium (e.g.,

gestures, facial expressions, etc.) should not be problematic for these children given that their nonverbal abilities are intact. In summary, their social behaviour should appear to be verbally deficient and impulsive.

While subtype II children should manage reasonably well in social settings which emphasize the verbal medium, they should find nonverbal settings and demands problematic due to their impaired nonverbal abilities. Also, in contrast to type I children, subtype II children should be predisposed to over-controlled maladaptive behaviour because a) logical reasoning associated with their intact verbal skills should be much more influential in guiding their social behaviour, and b) their intuitive, holistic tendencies, which are associated with nonverbal processes (Paivio, 1971) should be inhibited due to their impaired nonverbal abilities. Thus, subtype II children are likely to require training to remediate their nonverbal social deficits, and may also require a program of contingent reinforcement to enhance their use of skills which are within their behavioural repertoire. In summary, their social behaviour should appear to be nonverbally deficient and over-controlled.

Since subtype III children do not display appreciable impairment in either their verbal or nonverbal abilities, it is reasonable to assume that social settings stressing the verbal medium should be no more problematic for these children than those which stress the nonverbal medium. Nevertheless, children of this subtype should show a strong tendency to under-controlled maladaptive social behaviour with their difficulties in this regard reflecting their generalized impairment of self-regulation. However, there is also some room to speculate that these children may differ modestly from subtype I children in that their intact verbal abilities

could provide greater opportunity for the appearance of over-controlled maladaptive behaviour. In other words, while subtype III children are likely to display a predominance of under-controlled behaviour, they are the most likely of the three subtypes to display a "mixed" disturbance pattern with both under- and over- reacting maladaptive social behaviours being represented. Thus, these children are likely to require self-control training, and may also require a program of contingent management to enhance their use of skills which exist within their behavioural repertoire. In summary, their social behaviour should appear to be predominantly impulsive, and poorly self-controlled, but it may also display some over-controlled or inhibited features.

#### Slow Learners

With very few exceptions, only normal achievers have been employed as comparison subjects in investigations into learning disabilities (Harris, 1982). However, there are at least two good reasons to believe that slow learners (SLs) (i.e., children who obtain a 'flat' profile of abilities under formal assessment, in association with IQ scores in the 80 to 89, 'low average' range, and achievement commensurate with ability) may be more appropriate comparison subjects, particularly in studies examining the social difficulties associated with specific learning disabilities. First, LD students obtain IQ scores which fall disproportionately into the low end of the 'average' range of the WISC-R (Clarizio & Phillips, 1986). Since IQs are normally distributed, most SLs will obtain IQs in the upper end of the 'low average' range. Thus, generally speaking, both of these groups are inferior to normals in their

global level of intellectual ability; and much more comparable in this regard than is commonly recognized. Hence, with SLs serving as a comparison group rather than normals, the LD child's social difficulties arising from specific cognitive deficits are unlikely to be as clouded by the LD child's inferior general level of cognitive ability. Secondly, SLs are much more likely than normals to have encountered educational experiences similar to those of the LD: failure, clinical involvement and special education services. Thus, with SLs as controls, the reactive effects of the LD child's academic history are much more likely to be equated, thereby making the social deficits peculiar to his/her specific learning disability more apparent.

#### The Social Behaviour of Slow Learners

Unfortunately, the few studies which have examined the social behaviour of slow learning or low achieving students have not restricted the samples employed to children who obtain: i) a 'flat' profile of cognitive skills, ii) IQ scores which fall in the 80 to 89 range, and iii) achievement commensurate with their level of ability. Consequently, it is not known if SLs (i.e., children who meet these criteria) exhibit social skill difficulties and training needs which are similar to, or different from those of the LD. In contrast, the social behaviour of the Educable Mentally Retarded (EMR), who obtain IQs in the 50 to 75 range, has been the subject of a great deal of research. Given that the results of these studies with the EMR serve to illustrate social difficulties which are associated with generalized intellectual impairment, rather than specific learning disabilities, this research is summarized below because it may

point to areas of social difficulty which the LD do not encounter but could, nevertheless be associated with the generalized, albeit very modest, intellectual impairment of SLs.

A number of studies have shown that EMR students are less accepted and more rejected than their nonhandicapped peers (e.g., Goodman, Gottlieb & Harrison, 1972; Gottlieb, Semmel & Veldman, 1978). This research also suggests that the acceptance and rejection of these children arise from different sources. In particular, their rejection appears to be prefaced upon their misbehaviour (e.g., talkativeness and restlessness) in general (Gottlieb et al., 1978), and their antisocial behaviour in particular (Johnson, 1950; Baldwin, 1958), rather than simply upon the absence of socially desirable behaviour (Gottlieb et al., 1978). Nonhandicapped males, in general, tend to be more rejecting of EMR students than nonhandicapped females (Goodman et al., 1972). EMR students enrolled in integrated programs are more rejected than those attending segregated programs (Iano, Ayers, Heller, McGettigan & Walker, 1974). Acceptance, on the other hand, appears to vary with the child's level of retardation (Dentler & Mackler, 1962; Diggs, 1963), academic competence (Gottlieb, 1974; Gottlieb et al., 1978), and the parents' socioeconomic status (Monroe & Howe, 1971). Females (Bruninks, Rynders & Gross, 1974), younger students (Goodman et al., 1972; Peterson, Peterson & Scriven, 1977), and urban, as opposed to suburban students (Bruninks et al., 1974) appear to be much more accepting and tolerant (e.g., neither actively accepting nor rejecting) of EMR students (Goodman et al., 1972). Gottlieb & Switsky (cited in Stasinos, 1984) found that the attitudes of nonhandicapped children towards retarded children



improved between the early and later elementary years, but Morrison & Peck (cited in Stasinos, 1984) documented a decrease in the level of social acceptance that mildly handicapped children receive from the early to late elementary school years.

Negative stereotypes are likely to be a factor contributing adversely to the social status of retarded students (Wiley, 1966). For example, Jaffe (1966) showed that behaviour typical of the EMR population was much better accepted when it was not associated with the 'EMR' label. Similarly, Gottlieb (1975) showed that normal students responded more negatively to acting-out behaviour when the child exhibiting that behaviour was identified as being EMR. Principals' ratings on the semantic differential revealed that the EMR were seen less favourably than normals on a number of dimensions reflecting personality and morality (Smith, Flexer & Sigelman, 1980). Teachers tend to be less accepting of these students (Kingsley, 1967), and it has also been demonstrated that teachers show a high degree of agreement with their nonhandicapped students' perceptions of the behaviour and academic abilities of EMR children in their classes--perceptions which appear to accurately predict the EMR child's social status (Ballard, Corman, Gottlieb & Kaufman, 1972). That this may reflect the transmission of negative stereotypes to nonhandicapped students was suggested in a study by Semmel et al (cited in Gottlieb et al., 1978) which found that teacher attitudes exerted a direct influence upon nonhandicapped students' perceptions of EMR children. However, other researchers have suggested that first impressions of EMR children tend to be unfavourable and enduring (Gottlieb, et al., 1978).

Efforts to enhance the social status of EMR children have not proven to be particularly effective or durable. For example, neither the provision of supportive services (Iano et al., 1974), the passage of time (Monroe & Howe, 1971), the duration of exposure to nonhandicapped peers (Gottlieb, et al., 1978), enrollment in regular or flexible, ungraded programs (Ballard et al., 1977; Iano et al., 1974), dispensing with labelling practises, nor reintegration without the EMR label (Goodman, et al., 1972; Gottlieb, 1975) appear to improve the social standing of these children. However, co-operative, in-school activities, particularly those involving popular children, have been shown to produce significant short-term gains in the social acceptance of EMR students (e.g., Ballard, et al., 1972; Chennault, 1967). Unfortunately, though, the social rejection of the EMR students involved remains unchanged despite their improved acceptance (Ballard et al., 1977). Moreover, this heightened acceptance soon disappears after treatment is terminated (Ballard et al., 1977; Rucker & Vincenzo, 1970).

Despite the foregoing, there appears to be a number of EMR children who are quite popular with their same-sex nonhandicapped peers (Bruininks et al., 1974). There is also some evidence suggesting that withdrawing tendencies, at least in the case of very mildly retarded children, may be associated with greater tolerance by their nonhandicapped peers (Lapp, 1957).

A number of parallels between the social difficulties of the EMR and LD are apparent. First, unpopularity appears to be a chronic problem for the majority, but not all children in both of these groups. Second, they are negatively stereotyped and tend to give first impressions which

are unfavourable and persistent. Third, both are subject to unpopularity arising from poor achievement and the apparent limits on their ability to learn. Fourth, the sex of children in both groups appears to play an important role in their acceptance. Fifth, efforts designed to enhance their social status do not appear to produce sustained results. Sixth, improved relations with peers appear to be associated with a withdrawing orientation in children of both of these groups. In addition, neither the LD nor the EMR fit nicely into the academic mainstream since differences in size, age, social functioning, achievement, or level of intellectual ability invariably make them different from the nonhandicapped children with whom they are integrated (Iano, 1972). Finally, comparable results have been reported for these groups on teacher-completed behaviour rating scales (Gajar, 1980). However, differences in teacher ratings are reported more frequently (e.g., Feagans & McKinney, 1981; McKinney & Clifford, 1975; McKinney & Foreman, 1982), with these differences generally being quantitative, rather than qualitative in nature. Thus, the LD and the EMR do appear to have a large number of areas of social difficulty in common, and from this one could speculate that SLs may also exhibit many areas of social difficulty similar to those of the LD.

With regard to the present study, since SLs and the LD are quite comparable in their general level of intellectual functioning, and also in the nature of their likely educational experiences, a systematic comparison of the social deficits of these groups is of considerable interest in examining the relationship between learning disabilities and social difficulties. This is because: a) the social deficits of slow learners

cannot be attributed to specific learning disabilities, and b) the research with EMR students provides a good deal of suggestion that there may be numerous areas where the social difficulties of SLs and the LD overlap. In addition, such a comparison is also of interest concerning the nature of social skill training these groups may require since the EMR research suggests that SL and the LD may exhibit quantitative, rather than qualitative differences in their social deficits.

#### Expected Social Skill Profile of Slow Learners

To the extent that a child's social skill profile reflects the development of his/her cognitive abilities, SLs should function equally well under demands for competent verbal and nonverbal social behaviour since these children are characterized by a relatively even, but depressed profile of results under formal assessment. Moreover, since such a child's logical, deductive processes can therefore be assumed to be in balance with his/her holistic, intuitive abilities, SLs should not be inordinantly predisposed to over-reacting or under-reacting behaviour disturbance patterns. Thus, based upon their measured cognitive skills, SLs should display relatively even, but delayed development across the skill, performance and self-control domains, with their behaviour appearing essentially to be of an immature nature.

#### Behaviourally Disordered

A substantial number of children who are neither mentally retarded nor learning disabled also exhibit maladaptive interpersonal behaviour which is of appreciable concern (Murray & Whittenberger, 1983). The

general terms used to refer to these children are numerous and include: the behaviourally disordered (BD), emotionally disturbed, emotionally handicapped, socially maladjusted, and others. The terms customarily used to refer to the specific disturbance patterns they exhibit are even more varied and include: aggressive, schizoid, delinquent, withdrawing, and many others. These children are of particular interest in the present context because their maladaptive social behaviour occurs without evidence of the appreciable difficulties in learning that characterize the LD and SLs.

Empirical classification methods have been used extensively to study these children and the behaviour they display (e.g., Achenbach, 1982; Achenbach & Edelbrock, 1978; 1982; Quay, 1977; 1979; Quay & Patterson, 1975). This research is a consensus in finding:

- 1) that there are essentially two broad, overarching classes of behaviour disorders,
- 2) that some of the specific, or 'narrow band' disturbance patterns subsumed by these overarching classes are characteristic of particular developmental stages, and
- 3) that there are important differences in the patterns of disordered behaviour displayed by males and females.

The two general, overarching categories have been given a variety of names: Conduct Disorder & Personality Disorder (Quay, 1979); Excesses & Deficits (Ross, 1980); Undercontrolled & Overcontrolled (Achenbach, 1982); Externalizing & Internalizing (Achenbach, 1978; Achenbach & Edelbrock, 1979); Over-reacting & Under-reacting (Stott, 1970). The first category includes a broad range of behaviours that

typically irritate, harm or disrupt others. Fighting, destructiveness, temper tantrums and disobedience are common instances (Achenbach, 1982). The three characteristics these over-reacting behaviours most often appear to reflect are: aggression, antisocial tendencies and hyperactivity. The under-reacting category, on the other hand, involves behaviours suggestive of personal distress. Fearfulness, crying, hypersensitivity and poor self-confidence are common examples (Quay, 1979). The core features of this class of behaviours appear to be withdrawal, depression and anxiety. For the most part, over-reacting disturbances show greater stability across the developmental years than under-reacting disturbances (Achenbach, 1982). In addition, the latter appear to be much more responsive to conventional therapeutic interventions (Achenbach, 1982) and may remit spontaneously, particularly in younger children (Stott, 1970).

#### The Social Behaviour of the Behaviourally Disordered

Barron & Earls (1984) reviewed a host of studies which converge on three major factors which may serve as contributors to the maladaptive behaviour that these children exhibit. The first is disturbed dynamics within the family unit. It includes marital discord, parental mental illness, ineffective problem solving, negative parent-child interactions, and severe parental criticism of the child. The second is stress on the family unit. Some examples are: the onset of physical illness and the need of health services for children, single parent settings, separation from the parents, etc. The third is known as 'temperament' and refers to stable and enduring aspects of the child's behaviour. It is assumed that a

problematic temperament may contribute adversely to interactions within the family, particularly those involving the child; and may also serve as an important general stresser on the family as well (Barron & Earls, 1984).

A number of findings of research into behaviour disorders are reminiscent of the patterns of social behaviour observed in the LD. Several of these are illustrated well in a large scale study conducted by Achenbach & Edelbrock (1978) which employed behavioural data on 6-11 and 12-16 year old males and females. These researchers found that 'delinquent' and 'aggressive' narrow band disturbance patterns of the over-reacting category appear in both sexes during both of these developmental periods. However, an under-reacting, narrow band disturbance pattern, labelled 'schizoid', appeared only in males during both of these developmental periods. Girls, on the other hand, exhibited a 'schizoid-obsessive' narrow band pattern in the 6-11 year age level, while older females displayed an 'anxious-obsessive' narrow band disturbance.

Also similar to the LD, the social interactions of BD with their nonhandicapped peers tend to be of decidedly negative tone (Milich & Dodge, 1984). The BD are both poorly accepted (Gresham, 1981) and strongly rejected by their peers (Milich & Landau, 1984). Importantly, their poor peer relationships have been shown to be significantly associated with later court-reported delinquency (Roff & Sells, 1970).

Despite the sound intellectual ability of BD children in general (Gajar, 1980), a number of researchers have shown that children so diagnosed may be deficient in a variety of skills which are necessary for coping with a wide range of social situations (e.g., Dishion et al., 1984; Freedman, Rosenthal, Donahue, Schlundt & McFall, 1978; Schumaker et

al., 1982). Schumaker et al. (1982), for example, found that non-LD youths performed significantly better than LD and delinquent adolescents on seven out of eight social skills assessed in role playing situations. The deficits identified included: accepting, and giving negative feedback; giving positive feedback; conversation; negotiation; problem solving; and resisting peer pressure. However, the LD group was significantly better than the delinquent youths in resisting peer pressure. Similarly, Dishion et al. (1984) showed that delinquents were inferior to controls in seven areas of functioning which, among others, included interpersonal problem solving and interpersonal competence (e.g., extensiveness of friendships and the quality of peer and family relationships). Milich & Dodge (1984) found that aggressive subjects, hyperactive subjects and especially aggressive/hyperactive psychiatric subject groups all displayed some social information processing deficits in terms of: deficiencies in attending to relevant social cues; a bias towards interpreting social cues as being hostile in nature, and a bias towards responding aggressively to ambiguous provocation. Finally, and perhaps the most persuasive evidence indicating that the maladaptive behaviour of the BD may be due to important social skill deficiencies is Sarason's (1976) finding that youths who received social skill training committed fewer additional criminal offenses than groups of adjudicated youths who did not receive such training.

Despite these similarities, other research has found important differences between the BD and the LD. For example, the BD obtain much higher, and higher scores, respectively, on the over- and under-reacting broad-band behaviour disturbance categories (Gajar, 1980). They



also obtain higher scores on Immaturity/Inadequacy (Gajar, 1980), another broad-band behaviour disorder category often identified in empirical classification studies (Achenbach, 1982). In addition to this, the BD differ from normals on measures of socialization and temperament (Kohn, 1977) while the LD do not (McKinney & Forman, 1982). The BD also obtain poorer ratings than the LD on measures of considerateness and hostility (McKinney & Forman cited in McKinney & Feagans, 1983). Not surprisingly, teachers rate the overall behaviour of the BD less favourably than that of the LD (McKinney & Forman, 1982). However, the LD have been shown to have more trouble making friends than the BD (Meyers & Messer, 1981). Finally, most behaviour problems are only mild or moderate in severity; and many do not persist beyond a few years (Kaufman & Kneedler, 1981). Many LD children, on the other hand, encounter marked difficulties in social relationships (e.g., Schumaker & Hazel, 1984a), and it has been suggested that their difficulties tend to persist into adulthood (e.g., Kroll, 1983).

Taken together, the foregoing points to several general fronts where the problematic behaviour of the BD appears highly similar to that of the LD. In particular, there is evidence of developmental specificity, chronicity and also strong sex-linked differences in the maladaptive behaviour that both groups exhibit. Social status and peer relations are also areas of common difficulty; and both groups display a wide range of specific skill deficiencies. However, a number of important differences are apparent between these groups as well. One is a tendency toward spontaneous remission in some forms of behaviour disorder. Another is the suggestion of greater pathology in the families of BD children. A

third is in the differences observed between these groups and normals on measures of socialization, temperament, considerateness and hostility. A final point of difference is that the BD may be much more responsive to social skill training than the LD (e.g., Gresham, 1981b).

Given the foregoing, it would appear that BD children who display achievement commensurate with their ability, and an age appropriate, but flat profile of cognitive skills would be important comparison subjects in examining the social behaviour of the LD since, a) their social skill deficits cannot be attributed to a learning impairment and b) their problematic social behaviour cannot be attributed to a discrepancy between their expected and observed achievement or c) to cognitive immaturity which would make them unable to meet the demands for social behaviour which is appropriate for their chronological age.

#### Expected Social Skill Profile of the Behaviourally Disordered

To the extent that a child's social skill profile is influenced by the development of his/her cognitive abilities, normally achieving BD students should exhibit reasonably well developed skill domains since they are unimpaired in their ability to learn. Moreover, one would expect that, like SLs and subtype III children, BD students should function equally well under demands for competent verbal and nonverbal social behaviour given their 'flat' profile of cognitive skills. However, since over-reacting disturbances tend to irritate, harm or disrupt others, while under-reacting disturbances do not (Achenbach, 1982), it seems reasonable to speculate a) that over-reacting BD students are likely to be disproportionately represented in clinic referrals, and b) that such students are quite likely

to exhibit self-control domain deficiencies which are products of affective or environmental influences rather than cognitive factors. Finally, under-reacting BD students should show appreciable performance domain deficits since they are unlikely to be deficient in either the skill or self-control domains. In summary, the social behaviour of the BD should appear to be impulsive and poorly controlled, or over-controlled and inhibited.

### Summary of the Literature Review

Workers in the field of learning disabilities have long known that the LD tend strongly to present problematic social behaviour. However, systematic study in this area is relatively new, and was only recently sparked by data linking social problems in childhood with serious mental health and adjustment difficulties later in the individual's life. The major findings of this research are:

- a) that the majority of LD children are poorly accepted and often frankly rejected by their peers;
- b) that the LD are deficient in a wide range of skills which are useful, if not necessary, for effective social problem-solving;
- c) that gender is an important variable with regard to the social difficulties an LD child is likely to present and encounter;
- d) that adolescence is often associated with spontaneous improvement in the social relations of many LD students, however, some difficulties appear to persist even for these spontaneous improvers;
- e) that the degree of structure associated with a particular setting exerts an appreciable impact upon the observed social behaviour of the LD; and

- f) that the social behaviour of the LD deteriorates rapidly as increasing demands are made of their verbal and nonverbal skills.

Unfortunately, researchers seeking to develop social skill training programs for the LD appear to have made the implicit assumptions that the LD are unique in terms of the maladaptive social behaviour they present; and that social skill training for the LD must be tailored to the needs of the individual child. With regard to the uniqueness assumption, there is a good deal of evidence to suggest that the LD do have many social difficulties in common with the behaviourally disordered and also the intellectually handicapped. In particular, the BD and intellectually handicapped are also poorly accepted and often rejected. Their interactions with peers are often of a negative tone and teachers also tend to view them in a decidedly negative light. Both of these groups have also been shown to exhibit a wide range of deficiencies in a number of skills which are likely of value, if not essential for establishing and maintaining satisfying interpersonal relationships. In addition, it has also been reasonably well documented that the gender of children belonging to both of these groups exerts an impact upon the social difficulties they are likely to encounter or present. Finally, there is good reason to believe that social difficulties will be continuing concerns in the lives of many of the children belonging to these groups as well. Thus, there is ample reason to question the assumption that the LD are unique in the problematic social behaviour they present.

With regard to the training assumption, the explanations which have been advanced to account for the problematic social behaviour of the LD, and the LD subtype classification literature converge in suggesting that

there are three distinct subgroups within the LD population which may exhibit subgroup-specific problematic social behaviour. Children of the first subgroup, subtype I, are characterized by depressed Verbal IQs, indicating global language impairment. Presumably, their social difficulties would arise as a result of impairment in the processes subserving language comprehension and use which would make interpersonal communication problematic for them. Children of the second subgroup, subtype II, are characterized by depressed Performance IQs, reflecting selective impairment of such a child's nonverbal problem solving abilities which would hamper these children in their efforts to understand the nonverbal displays of others; and likewise, in their ability to express themselves nonverbally in a manner which others are able to comprehend. Children of the third subgroup, subtype III, are characterized by a depressed Factor III score on the WISC-R, combined with normally developed verbal and nonverbal abilities. These children exhibit a number of the features associated with the DSM III diagnostic category, Attention Deficit Disorder. Presumably, their social difficulties arise as a result of their inattentive, impulsive and distractible orientation which renders their social initiations untimely, and therefore unwelcomed. Thus, there is also reason to believe that there are distinct subgroups within the LD population who may present and encounter subgroup-specific difficulties in the social realm; and some suggestion that the social difficulties of these subgroups may be related to their underlying cognitive deficiencies.

To the extent that a child's social behaviour is importantly influenced by his/her profile of cognitive abilities, the expected social

skill profiles for SLs, the BD and each of the three LD subtypes would differ appreciably. Since the cognitive profile of SLs is flat and modestly depressed, their social behaviour should be characterized by its immaturity. Because the normally achieving BD are without evidence of cognitive impairment, they should show disproportionately few skill domain deficits, and comparable verbal and nonverbal social deficits. Given that subtype I are verbally impaired, and therefore impulsive, they should show many verbal deficits and also self-control deficits. In contrast, subtype II, who are nonverbally impaired, should be better self-controlled, but importantly deficient in their nonverbal, rather than verbal social behaviour. Finally, subtype III should be equally deficient in their verbal and nonverbal social behaviours since their verbal and nonverbal abilities are normally developed. However, they should be importantly self-control deficient, given their distractible, inattentive, and impulsive cognitive orientation.

#### Focus of the Present Study

The literature reviewed provides good reason to believe that the maladaptive social behaviour and social problems of the LD may be quite similar to those of the BD and SLs. However, to the extent that a child's profile of cognitive abilities influences his/her observable social behaviour, there is also reason to believe that the social behaviour of these groups may be importantly different. Since the comparability of the maladaptive social behaviour of these groups holds important implications regarding the nature of social skill training that may be appropriate for the LD, the first goal of the present study is to compare

and contrast the social deficits of these groups, both qualitatively and quantitatively, to see if the maladaptive social behaviour of the LD is unique.

The explanations which have been advanced for the problematic social behaviour of the LD suggest that there may be several different groups within the LD population which are characterized by the nature of their social difficulties. The LD subtype classification literature suggests that the social difficulties of at least three of these groups (e.g., subtypes I, II and III) may be related to their characteristic profiles of cognitive ability. Since the presence of groups such as these within the LD population is of considerable interest regarding the grouping of LD students for social skill training, and also in terms of the nature of training that may be required, the second goal is to compare and contrast the social deficits of these three LD subtypes; first to see if they do display similar or different patterns of social difficulties, and secondly, to see if their social problems do correspond with their respective profiles of cognitive deficits.

The third goal of the present study is to probe into the validity of grouping LD children into LD subtypes for social skill training. In the interests of expedience and experimental control, this will not be assessed by providing a conventional social skill training intervention. Rather, it will be pursued by testing to see if subtypes I and II show differential responsivity to verbal and nonverbal cues; with a differential response taken as a suggestion that these subtypes might respond differently to formal social skill training. More specifically, the validity of these groupings will be addressed by testing to see if subtypes I and II show

differential improvement in their ability to accurately identify a number of different, enacted affective states (which are commonly encountered in social exchange) following their exposure to a filmed program which focuses exclusively upon the verbal or nonverbal cues which uniquely characterize each of these affective states. For the convenience of the following presentation, these programs are called verbal and nonverbal training, respectively. However, it should be kept in mind that the responsivity of these subtypes to the verbal and nonverbal content of these filmed programs is of primary interest in the present context, rather than a change in their observable social behaviour.



### CHAPTER THREE

#### HYPOTHESES

From the literature reviewed, a total of eight hypotheses were developed to provide converging tests of the assumption that the LD are unique in their maladaptive social behaviour. Six additional hypotheses were developed to provide converging tests of the assumption that the LD are heterogeneous with regard to their social skill deficits. Finally, two more hypotheses were developed to test the validity of grouping LD students into LD subtypes for social skill training. These hypotheses appear in three groups below with the first two groups organized to reflect a progression of focus from predictions based upon teacher-completed inventories and rating scales, to response measures gathered prior to training. The final group of hypotheses is concerned only with skill training outcome data.

#### Tests of the Assumption that the Social Behaviour of the LD is Unique

##### Rated Social Behaviour

##### Behaviour Problems

Hypothesis 1. Since the BD have been shown to obtain higher behaviour problem ratings than children displaying appreciable learning problems (e.g., Gajar, 1980), they should obtain higher total scores on the Bristol Social Adjustment Guides (Stott, 1970) than the LD or SLs.

Hypothesis 2. Since the BD obtain much higher over-reacting behaviour problem ratings, but only modestly higher under-reacting behaviour problem ratings than children displaying appreciable learning

problems (e.g., Gajar, 1980), the BD should obtain higher Over-reacting:Under-reacting ratio scores on the Bristol Social Adjustment Guides than the LD or SLs.

Hypothesis 3. Because the cognitive profiles of two of the three LD subtypes (i.e., subtypes I and III) are consistent with over-reacting behaviour disturbance problems, whereas the cognitive profile of SLs is not, the LD should obtain significantly higher Over-reacting:Under-reacting ratio scores on the Bristol Social Adjustment Guides than SLs.

#### Social Deficit Profiles

Hypothesis 4. Slow learners should obtain more teacher-rated skill-domain deficits on the Social Behaviour Assessment (Stephens, 1980) than the LD who, in turn, should obtain more skill deficit ratings on this measure than the BD because a child's skill domain development is likely to reflect his/her general level of intellectual ability.

Hypothesis 5. The BD should obtain more teacher-rated performance-domain deficits on the Social Behaviour Assessment Scale than the LD who, in turn, should obtain more performance-domain deficit ratings than SLs because:

- a) the BD obtain higher under-reacting behaviour problem ratings than children who display appreciable learning problems (e.g., Gajar, 1980);
- b) the behaviour of subtype II is likely to be over-controlled and therefore predominantly performance-domain deficient;
- c) subtype III displays a 'mixed' impulsive/over-controlled cognitive orientation and therefore should also exhibit performance domain

deficits; and

- d) the social deficits of SLs are likely to be distributed evenly across the three social domains rather than concentrated in the performance domain.

Hypothesis 6. Because BD referrals tend strongly to show over-reacting behaviour problems, and subtypes I and III are likely to be impulsive, while SLs are not, the BD should obtain more teacher-rated self-control domain deficits on the Self-Control Rating Scale (Kendall & Wilcox, 1979) than the LD who, in turn, should obtain more self-control deficits on this measure than SLs.

### Pretraining Measures

#### Accuracy

Hypothesis 7. Prior to social perception training, and on the basis of differences in their general levels of intellectual functioning, SLs should be less accurate in identifying affective states as modelled by an actress than the LD who, in turn, should be less accurate on this task than the BD, who should be comparable to normals.

#### Attentiveness

Hypothesis 8. Since the LD are characterized as being inattentive, and with attention measured as the consistency of a subject's correct responses, the LD should be less attentive than all comparison groups during a social perception task which requires them to identify consecutive blocks of the same stimuli arranged in different orders.

## Tests of the Assumption That the LD Are Heterogeneous With

### Regard to Social Skill Deficits

#### Rated Social Behaviour

##### Behaviour Problems

Hypothesis 9. Since subtypes I and III are impulsive while subtype II is likely to exhibit over-controlled behaviour, subtypes I and III should obtain higher Over-reacting:Under-reacting ratio scores on the Bristol Social Adjustment Guides than subtype II children.

##### Social Deficit Profiles

Hypothesis 10. Because subtype II is likely to show a preponderance of over-controlled behaviour while subtypes I and III are not, subtype II should obtain more teacher-rated performance-domain deficits on the Social Behaviour Assessment scale than subtypes I and III.

Hypothesis 11. Because subtypes I and III are impulsive while subtype II is not, they should obtain more teacher-rated self-control-domain deficits on the Self-Control Rating scale than subtype II.

Hypothesis 12. Because the learning impairment of subtype I children selectively involves their verbal cognitive abilities, subtype I should obtain more deficits across the three social domains on items drawn from the Social Behaviour Assessment and the Self-Control Rating Scale which make explicit demands for competent verbal social behaviour than on items drawn from the same scales which make explicit demands for competent nonverbal social behaviour.

Hypothesis 13. In contrast to subtype I, and because their learning impairment selectively involves their nonverbal cognitive abilities, subtype II should obtain more nonverbal than verbal deficits across the

three social domains on Verbal and Nonverbal items drawn from the Social Behaviour Assessment and Self-Control Rating Scale.

### Pretraining Measures

#### Attention

Hypothesis 14. Prior to training, subtype III should be less attentive on a social perception task than subtypes I and II because these children are afflicted by a disorder of attention whereas subtype I and subtype II children are not.

### Tests of the Validity of Subtypes I and II As Importantly-

#### Different Groups for Social Skill Training

#### Training Outcomes

Hypothesis 15. Subtype I should benefit more from social perception training which instructs them in verbal, as opposed to nonverbal social cues, because they are impaired in their verbal problem-solving skills.

Hypothesis 16. Subtype II should benefit more from social perception training which instructs them in nonverbal, as opposed to verbal social cues, because they are impaired in their nonverbal problem-solving skills.

## CHAPTER FOUR

## METHOD

Subjects

A total of 72 male students (67 whites, 5 nonwhites), ranging in age from 9 years 0 months to 12 years 0 months ( $\underline{M}$  = 10 years 2 months,  $\underline{SD}$  = 1 year 1 month) served as subjects in the study. Nineteen of these students were enrolled in full-time, and 17 were enrolled in part-time special education placements. The remaining 36 students were all attending regular classes on a full-time basis in the third to the sixth grades. This sample included 60 clinical and 12 normal subjects. Females were excluded due to the likelihood of sex-related differences and their lower numbers in the clinical populations of interest (e.g., American Psychiatric Association, 1980).

All clinical subjects were drawn from one of three sources. The first source, which provided a total of 8 subjects suitable for the study, was a school for learning disabled children located in a major urban center in the province of Alberta. The second, which also provided 8 suitable subjects, was a composite school (i.e., grades KG to 12) situated in a small community in southern Alberta. Its enrollment included a substantial number of children living within the surrounding rural area. The third source, which provided a total of 44 suitable subjects, was a large school division in the province of Manitoba. Thirteen of this division's 14 participating schools were located in a medium sized urban center. The fourteenth school, which provided three of these 44 subjects, was situated in a small agricultural community. Its enrollment comprised principally children residing in the surrounding rural areas. The 12 normal subjects

employed in the study were drawn from two large elementary schools located in the same urban center as the school for learning disabled children.

All clinical subjects had special education files on record and had been administered the WISC-R within the past two years. These children were secured as subjects by requests for referrals from psychologists and special education co-ordinators working within the child's school. A child's inclusion as a subject was conditional upon: a) his voluntary participation, b) the receipt of a signed parental consent form, c) the voluntary co-operation of the child's homeroom teacher in completing the checklists and inventories necessary to assess the child's social behaviour and adjustment in and about the school, and d) the child's meeting the criteria for one of the groups detailed below.

The LD portion of the clinical sample was represented by a total of 36 children who had Full Scale WISC-R IQ scores on record which fell into the "average" range (e.g., 90 to 109), and, whose profile of WISC-R results allowed them to be unambiguously assigned to one of three ( $n = 12$ ) subgroups of Subtype I, II, or III disabled learners according to the criteria detailed immediately below.

- Subtype I: Verbal IQ 12 or more points below Performance IQ ( $p < .05$ ) in the absence of a significantly depressed ( $p > .05$ ) Factor III triad.
- Subtype II: Performance IQ 12 or more points below Verbal IQ ( $p < .05$ ) in the absence of a significantly depressed ( $p > .05$ ) Factor III triad.

Subtype III: Verbal IQ within 12 points of Performance IQ ( $p > .05$ ) combined with a significantly depressed ( $p < .05$ ) Factor III triad.

In addition to this, each LD child included in the study was required to exhibit at least one academic deficit, with a deficit being defined as an obtained score on either the Reading, Mathematics or Written Language Clusters of the Woodcock-Johnson Psychoeducational Battery (Woodcock & Johnson, 1977) below the 16th percentile for the child's mental age (MA).

The slow learner (SL) group comprised a total of 12 children who a) had a Full Scale WISC-R IQ score in the "low average" (i.e., 80-89) range on record in the absence of a statistically significant Verbal-Performance (V-P) IQ discrepancy or a significantly depressed Factor III triad, and b) obtained achievement scores on the Reading, Mathematics and Written Language clusters of the Woodcock-Johnson which fell between the 28th and 73rd percentiles for their respective MAs, to reflect the typical range of achievement for normal children of the same MA (Woodcock and Johnson, 1977).

The behaviourally disordered (BD) group comprised 12 children who a) had a Full Scale IQ score on the WISC-R which fell into the "average" range in the absence of a statistically significant V-P discrepancy or a significantly depressed Factor III triad, b) obtained current Over-reacting and/or Under-reacting scores on the Bristol Social Adjustment Guides (Stott, 1970) at or above the 84th percentile, and c) earned achievement scores on the Reading, Mathematics and Written Language clusters of the Woodcock-Johnson Psychoeducational Battery which fell between the 28th



and 73rd percentiles for their respective MAs.

The 12 normal (N) subjects included in the study were selected essentially on the basis of their chronological age and availability. Since they were included primarily to index the difficulty of a social perception task developed for the study, no ability, achievement or social assessments were completed for the children of this group. Nevertheless, according to parental reports, none of these children had clinical files on record at school, none had been retained at any time during their academic career, and none was reported as currently experiencing notable academic or social difficulties.

### Instruments

The Wechsler Intelligence Scale for Children - Revised (WISC-R) (Wechsler, 1974). The WISC-R is one of the best known, most widely used and reliable individually administered tests of intelligence. It consists of six verbal and six performance subtests of which ten comprise the test proper and are scored to provide Verbal, Performance and Full Scale IQs. The subtests assess a diverse set of abilities reflecting the author's position that "Intelligence can manifest itself in many forms ... (and) is best regarded ... as a composite or global entity." (Wechsler, 1974, pp. 5-6).

Kaufman (1975) performed a factor analysis on the standardization data and found evidence for three factors underlying the instrument at each age level from 6½ to 16½. These factors were interpreted as representing verbal comprehension, perceptual organization and freedom from distractibility. Kaufman noted that these factors were similar to

those underlying an earlier version of the same instrument.

With the exception of tables of the intercorrelations among a) the subtests and b) the IQ scores, information on the validity of this instrument is rather limited in the manual. Nevertheless, Vernon (1984) reviews a number of studies which report correlations ranging from the mid .80s to the high .90s with other widely used tests of intelligence, and notes that the Verbal IQ provides a particularly good predictor of grades and scholastic achievement.

The Woodcock-Johnson Psychoeducational Battery (WJ) (Woodcock & Johnson, 1977). The WJ is an individually administered multiple-skill battery designed to assess cognitive ability, scholastic aptitude, academic achievement and interests in individuals ranging from 3 to 80 years of age. It contains twenty-seven subtests which are organized into three parts. Only Part 2 of the battery (academic achievement) is of present interest. It contains ten subtests which assess academic achievement in seven content areas. The WJ was used in the present study to assess the Reading, Mathematics and Written Language achievement of all referred clinical students. Only those referrals whose achievement met the criteria adopted for their respective groups were employed as clinical subjects.

The instrument is composed of subtests, but its authors recommend that "cluster scores" (i.e., scores on related groups of subtests) be used as the unit of analysis. The Reading cluster is comprised of the Letter-Word Identification, Word Attack and Passage Comprehension subtests. The Mathematics cluster includes the Calculation and Applied Problems

subtests. Finally, the Written Language cluster includes the Dictation and Proofing subtests. A variety of scores can be derived from a student's results on each cluster. Of these, 'percentile rank for age' was employed to index the Reading, Mathematics and Written Language achievement of all subjects employed in the present study, with the subject's mental age, as calculated from his reported Full Scale IQ, used in place of his chronological age in order to assess each child's achievement relative to his cognitive development.

All three parts of the battery were normed on the same 4,732 subjects with 3,900 of these comprising the school-aged portion of the sample. The normative data were gathered in 18 different American communities with the sample employed stratified by: sex, race, occupational status, geographic region and urban and rural community. A weighting system was also utilized to minimize disparities between the normative sample and the 1970 U.S. census data.

Validity studies of the WJ appear to be restricted to those reported in the battery's technical manual. However, according to the Salvia & Ysseldyke (1981) review of the battery, these 10 studies do provide adequate support for the instrument's validity. All reliability data were derived from the performance of the norm sample. Split-half reliabilities are reported for cluster scores in the appendices to the technical manual. The median reliabilities for all academic clusters exceed  $r=.85$ . No data are reported on test-retest reliability.

The Bristol Social Adjustment Guides (Stott, 1970). The Bristol Social Adjustment Guides (BSAG) is a 116 item teacher-completed behaviour checklist designed for the systematic recording of the in-school behaviour of children aged 5 to 16 for the purpose of detecting and diagnosing social maladjustment (Stott, 1970). The current edition of the BSAG is based upon a normative sample of 2,527 Canadian school children.

Of particular interest to the present study, this instrument provides percentile scores and diagnostic ranges on two main scales (Over-reacting and Under-reacting) which reflect the two overarching modes of maladjustment repeatedly detected in empirical studies of behaviour disorders in children and adolescents (Achenbach, 1982). Also of interest to the present study is the BSAG total score. Although Stott does not advocate its use for diagnostic purposes, he does offer that the BSAG total score would "correspond to an index of the general physical health of a population" (p. 4).

To examine the internal consistency of the BSAG, Stott (1970) compared the distribution of items within the current edition to the distribution of items in an earlier version of the instrument. The results provided support for a number of syndromes delineated in the original version. As further evidence of internal consistency, Stott (1970) reports that Under- and Over-reactivity, the main types of maladjustment measured by the BSAG, were manifest in similar behaviour over the age range of the sample.

External validation was pursued through a number of smaller-scale studies which revealed significant relationships between: the number of

health problems reported in children and Over- and Under-reacting scores; increases in Over-and Under- reacting scores with the severity of motor impairment; and increases in syndrome scores with progressive number of offenses committed by juvenile delinquents (Brantley, 1984).

McDermott (1984) recently completed an extensive series of studies on the BSAG normative data. He concluded that the Under- and Over-reacting scales can be used as primary measures of maladjustment across the age ranges for which the instrument was designed, and that the scales are empirically justified.

In the present study, BSAG data were gathered on all clinical subjects to serve two purposes. First, the total BSAG score was used as a global index of the level of the child's maladjustment. Second, each child's obtained scores on the Over- and Under- reacting scales were used to calculate a ratio of over-reacting to under-reacting (Over-reacting:Under-reacting) maladjustment; with these ratios serving as indices of the nature of the child's expressed maladaptive behaviour. As such, ratios greater than unity were interpreted as reflecting predominantly over-reacting disturbances; those of less than unity were taken to represent disturbances of a predominantly under-reacting nature; and ratios of unity were interpreted as reflecting mixed disturbance patterns.

Social Behaviour Assessment (SBA) (Stephens, 1980). The SBA is a behaviour rating scale which is based upon the 136 skills contained in Social Skills in the Classroom (Stephens, 1978). The skills of the SBA are grouped into four categories: behaviours related to the environment,

interpersonal behaviours, self-related behaviours, and task related behaviours. Each of these categories includes a differing number of sequentially ordered skills which were selected on the basis of classroom observations, a content analysis of existing behaviour rating instruments, empirical studies wherein specific behaviours were shown to be correlated with school success, and teacher surveys.

The instrument is designed for use with kindergarten to grade 6 students in direct observation or recall by informed teachers. Each behaviour listed is rated as: 0 = not applicable; 1 = exhibited at an acceptable level; 2 = exhibited at a lower than acceptable level; or 3 = behaviour never exhibited. Thus, teacher ratings on the SBA serve to specify specific skill and performance deficits in addition to indicating those behaviours which appear at acceptable levels.

La Nunziata and his associates (1981) found that behaviours identified on the SBA responded to instructional procedures offered in Stephen's curriculum. These researchers also reported interobserver agreement figures for the instrument ranging from 85% to 100% with a mean of 97.6% across their study. Stumme and his co-workers (1982) found the SBA highly effective in discriminating emotionally disturbed students from normals. Finally, a factor analysis of teacher ratings of the importance of each of the items for their classes (both regular and special education classes) indicated that the instrument possesses a high degree of internal consistency (Stumme et al., 1983).

In summary, although the SBA is without extensive technical data, the available research indicates that the instrument is useful for identifying and rating deficient social behaviours which teachers agree

are of concern for regular and special education classes alike.

The SBA was used in the present study to assess the overall skill and performance domain social behaviour deficits of all clinical subjects. This was accomplished by summing the number of items rated "3" and "2", respectively, for each child by his teacher. The SBA was also used to provide a measure of each clinical subject's verbal and nonverbal social behaviour deficits on the skill and performance domains. This was achieved by having each item of the instrument judged, before hand, by a panel of three adults, regarding its membership in one of the following categories:

- 1) Verbal - the item makes explicit demands upon the student which are predominantly verbal in nature (e.g., contributes appropriately during class discussions),
- 2) Nonverbal - the item makes explicit demands upon the student which are predominantly nonverbal in nature (e.g., waits in line for turn), or
- 3) Other - the item makes demands which are both verbal and nonverbal in nature, or is ambiguous in the nature of the demands it makes of the student.

On the basis of the panel's consensus, a total of 44 and 27 items were identified which belonged to the Verbal and Nonverbal categories, respectively. Skill and performance deficit scores were subsequently calculated for both Verbal and Nonverbal items as the proportion of each of these item types that were given "3" and "2" ratings, respectively, by the subject's teacher.

The Self-Control Rating Scale (SCRS) (Kendall & Wilcox, 1979). The SCRS is a 30 item teacher-completed rating scale designed to assess self-control in children. The instrument was developed from a cognitive-behavioural conceptualization of self-control. In this regard, deliberation, problem solving, planning and evaluation were adopted as the active cognitive factors. Thus, according to this conceptualization, a self-controlled child is seen as nonimpulsive. Behaviourally, a self-controlled child is seen to have the ability, following such deliberation, to execute a specific behaviour selected, and to inhibit alternate behaviours that are "cognitively disregarded" (Kendall & Wilcox, 1979).

Each of the 30 items of the SCRS is rated on an anchored 7-point continuum where a rating of 4 is given to represent the norm; and scores of 5 and above are used to reflect decreasing self-control. Means and standard deviations, based upon a sample of 59 boys and 61 girls are provided for children in the third and sixth grades.

Technical data on the SCRS were provided through a series of studies by the instrument's authors (Kendall & Wilcox, 1979). The inter-rater agreement for the scale is reported as ranging from 84% to 93% for an overall average of 86%. The internal reliability of the scale, as calculated by Cronbach's alpha, is reported to be .98 revealing a high degree of internal consistency among items. The test-retest reliability coefficient, over a 3-4 week period, was calculated to be .84. Intercorrelations are reported with SCRS results and those of several other measures. In particular, the SCRS is significantly related to latency and errors on the Matching Familiar Figures test, the Porteus mazes Q score, and also to behavioural observation. SCRS scores are negatively



correlated with age and appear to be unrelated to IQ since SCRS scores were shown to remain significantly correlated with other measures of self-control after mental age (MA), chronological age (CA), and both MA and CA were partialled out. Finally, the scale was shown to discriminate well between children who were referred due to problematic behaviour arising from limited self-control and nonreferred children who were matched on age and IQ.

In a factor analytic study reported by the authors, it was revealed that 71.7% of the total variance of the scale was accounted for by a single factor and that the majority of items loaded meaningfully on this factor. A second factor identified accounted for only 6.4% of the remaining variance. The authors interpreted this as indicating essentially a single factor solution which could appropriately be labelled cognitive-behavioural self-control (Kendall & Wilcox, 1979).

According to Kendall & Wilcox, these results, when taken together, provide convergent and discriminant validation of the scale. In addition, they note that the SCRS appears to measure the teacher's perception of both cognitive and behavioural aspects of self-control and to achieve this independently of the child's intelligence.

The SCRS was used in the present study with all clinical subjects to provide a) a global assessment of each child's self-control domain and b) to index the extent of his self-control impairment under explicit demands for socially competent verbal and nonverbal behaviour. With regard to the former, the sum of all SCRS items earning ratings of "5" and above was used as a measure of the child's global difficulty in self-control. With regard to the latter, a procedure identical to that used with the SBA

inventory was employed to identify, those SCRS items suitable for assessing the child's self-control under demands for verbal and nonverbal social competence. Similarly, the proportion of the 5 verbal and 5 nonverbal items so identified earning ratings of "5" or more were subsequently used as measures of the child's self-control impairment in the verbal and nonverbal domains, respectively.

### Procedure

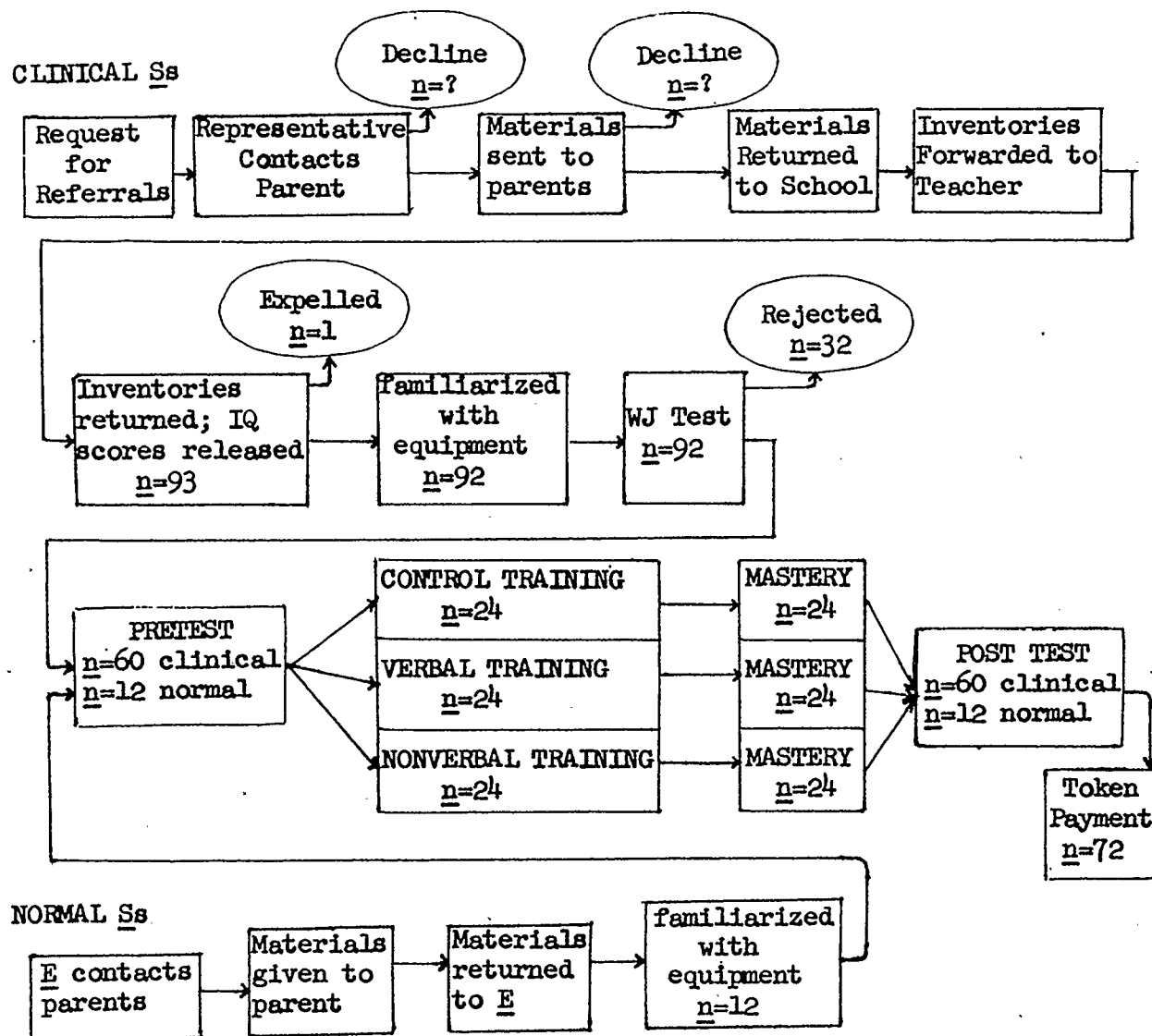
Figure 1 presents a detailed overview of the procedure employed with clinical and normal subjects. It provides an account of the number of subjects participating in each of the various stages of the study and also shows those points where potential subjects may have been lost, were lost, and were rejected.

As Figure 1 shows, parents of potential clinical subjects were first telephoned by a representative of the school to be informed of their son's suitability as a subject for the study. Those expressing an interest in having their child participate were then sent a detailed summary of the study along with consent forms to sign if, after studying the summary, they approved of their son's participation. When appropriately signed consent forms were returned to the school, they were routed to the child's homeroom along with the BSAG, the SBA and the SCRS for his teacher to complete. The completed inventories were then returned to the principal's office where they were picked up by examiner and scored. IQ test scores were generally released by the school at this time as well.

Since none of the involved homeroom teachers declined to complete the necessary inventories, each of these potential clinical subjects was

Figure 1

A Detailed Overview of the Procedure Employed With  
Clinical and Normal Subjects



eventually excused from his class and escorted to an isolated area (usually a small room reserved for testing or medical care) to undergo an individual test session.

At the outset of the session each subject was:

- a) asked if he could recall discussing the study with his parents and informing them of his wish to take part,
- b) familiarized with the test materials and video equipment to be used during the session,
- c) assured that nothing was involved that would frighten or harm him, and
- d) asked frankly if he still wished to participate.

Since no potential subjects refused to continue at this point, each child was then administered the Reading, Mathematics and Written Language achievement clusters of the Woodcock-Johnson. This was followed by a brief intermission when the Woodcock-Johnson was scored in order to determine if the child still qualified as a suitable subject.

A total of 32 children failed to meet the achievement criteria for their respective groups. Accordingly, they were assessed no further but were allowed, nevertheless, to view a 'control training program' (described below).

Each child who met the achievement criteria for his respective group then went on to view one of three preprogrammed video tapes. Each of these tapes included four segments--a pretest, a training program, a mastery test and a post-training test. (See Appendix C, D, E, and F for transcripts). The three tapes were identical with the exception of the training and mastery segments. As such, each tape served to assess

the subject's skill prior to training; provide him one of three forms of training (i.e., Control, Verbal or Nonverbal)); assess his mastery of the training provided; and reassess his skill following his demonstrated mastery of the training provided. The particular tape each child viewed was selected at random, beforehand, with the provision that each of these tapes would be presented to four members of each of the five ( $n = 12$ ) clinical groups.

The video tapes were presented by a portable Sony Beta player combined with a 35 cm Pulsar colour monitor. The subject was seated at a distance of .5 meters directly in front of the monitor and given the liberty of adjusting its sound level to his personal preference. The experimenter sat to the left of the subject with pen and clip board in hand to record the subject's responses and interrupt the running of the tape as conditions dictated.

#### The Pretraining Test (Pretest)

The pretest was a contrived, but artificial social perception task which was constructed to parallel the tasks frequently used in studies examining social perception deficits in the LD. Its primary purpose was to provide a measure of each subject's social perception ability in order to assess differences in the responsivity of the various subject groups to the verbal and nonverbal training programs. During this task, each subject viewed a number of affective states which were modeled by a videotaped actress. For each of these states the subject was required to guess, from a list of possible alternatives, how the actress was feeling. Since both visual and aural cues were simultaneously presented for each of these

affective states, the task was neither exclusively verbal nor nonverbal in nature. Rather, it provided reasonable approximations of social situations, or social demands, that the subject could conceivably encounter in naturally occurring social exchanges.

The pretest began with a brief narrative which a) stated that it is very important to be able to tell how another person is feeling, and b) encouraged a test-taking orientation by inviting the child to see how well he could tell how another person is feeling. The narrator then went on to say that to achieve the latter, very short films of an actress would be presented, and that following each film, the viewer would be asked to say aloud whether he thought the actress was feeling: happy, angry, sad, worried, or startled. The narrator then encouraged the subject to pay close attention because the films of the actress would follow immediately and were very short in duration.

Immediately after the introductory narrative, the video tape proceeded to present two blocks of five identical test items arranged in different random orders in which a teenaged actress modeled each of the five affective states noted above while simultaneously saying: "Sometimes, I just don't know what to do with you". Each of these items was approximately five seconds in duration and was separated by a 20 second inter-item interval. These items had been selected from a large pool of potential items on the basis of the consensus of a panel of three adult judges as portraying unambiguous aural and visual cues to characterize happy, angry, sad, worried, and startled states in the actress.

During each 20 second inter-item interval, the narrator returned to the screen to a) list the five choice alternatives, b) encourage the subject

to report his choice aloud so that it could be recorded, and c) call the subject's attention to the item to follow. This interval was extended as necessary whenever a child was slow to respond or when he made a response other than those given as acceptable alternatives. In the case of unacceptable responses (e.g., glad, mad, etc.) the five acceptable responses were again listed and the child informed that he must pick one of the five alternatives given.

Training Programs. Following completion of the pretest segment, each subject was immediately presented a control training program, a verbal training program, or a nonverbal training program. The primary purpose of the verbal and nonverbal training programs was to provide experimental subjects with a knowledge of selected verbal and nonverbal cues, respectively, sufficient to enable them to reliably identify the five affective states of interest. The purpose of the control training program, on the other hand, was to provide comparison subjects with information irrelevant to this task. The introduction to each of these training programs stated that the content to follow would be of value to the child and indicated that his mastery of the content would be appraised.

A) Control Program. The control training program contained five excerpts from various "Science International" television broadcasts for children. Each excerpt was approximately 2.5 minutes in duration. The topics covered included: detecting environmental polluters, whales, technologically advanced wheelbarrows, an exercise machine for dairy cows, and a security innovation for banks. Following each of these excerpts, the narrator reviewed the content and underscored the two key

points that each excerpt presented.

B) Verbal Training Program. The verbal training program focussed exclusively upon verbal cues associated with each of the five affective states modeled in the pretest phase of the study. To elaborate, very brief scenarios were first described by the narrator to provide a setting for the affective state of interest. The salient auditory cues of this state (i.e., those determined by the panel of adult judges) were then noted and demonstrated repeatedly using only the auditory component of a variety of filmed sequences which employed the same actress as had appeared in the pretest items. For example, one setting described was of a girl working quietly at her desk where a friend sneaks up behind her and shouts: "Boo!" very loudly. The salient cues noted were that this startled girl's voice would sound like a loud whisper and that her rate of speech would be very fast. The demonstration offered was a recording of the actress's voice saying, in a very rapid and breathy manner: "Oh my Goodness, you scared the life out of me!"

Review was an integral part of the training provided with each component of the program being reviewed in detail before the next was presented. In addition to this, the program actively encouraged the subject to reflect and recall the salient cues for each of the five affective states, and also provided him with knowledge of his success in this regard.

C) Nonverbal Training Program. The nonverbal training program closely paralleled the verbal training program. The important differences between them were: a) that salient nonverbal, rather than verbal cues were specified and b) that the demonstration of these cues involved only the visual component of the same demonstration sequences employed in



the verbal training program. Using the "startled" state again as an example, the subject was shown that the actress would jerk suddenly, with her eyes and mouth both opening wide simultaneously with this jerking movement.

Mastery Test. Following completion of the training film, which lasted approximately 15 minutes, each of the video tapes went on to test each subject for mastery of the content of his respective training program. Mastery for the verbal and nonverbal training programs was defined as the child's accurately reciting two salient cues (or reasonable approximations) for each of the five affective states. Subjects who had studied the control program were similarly required to recite two pertinent facts regarding each of the five "Science International" excerpts presented. All children failing to demonstrate mastery reviewed relevant portions of the training film until mastery was achieved.

Post Training Test (Post Test). Following mastery testing, all three of the video tapes presented the same post-training retest sequence. The retest sequence was identical in all respects to the pretest segment with the exception that the items within each of the five-item blocks appeared in a new random order. Responses were recorded exactly as they had been during the pretest segment and the inter-item intervals were similarly extended when necessary.

At the completion of each session, the child involved was given a colourful sticker as a token payment for his time, thanked for volunteering and escorted back to his classroom. In the vast majority of

cases, the sessions were completed easily within a two hour period of a single day. In no cases were the sessions extended beyond regular school hours and none of the children involved were required to forfeit their recess or special class activities in order to participate.

#### Procedural Differences With Normal Subjects

The 12 normal subjects employed in the study were children living in the experimenter's neighbourhood whose parents were acquainted with the experimenter. Contrary to the procedure employed with parents of clinical subjects, these parents were approached in person regarding their child's serving as a subject. Nevertheless, they were also provided with a written summary of the study to consider and were also required to sign consent forms. However, these parents were informed in advance that their children would serve as normal-control subjects for one portion of the study with their child's participation restricted to a) viewing one of the three video tapes described above, and b) being tested on the contents of the video tape presented. Accordingly, no social skill inventories, academic tests or adjustment measures were completed for these children.

These subjects were all tested in the examiner's home with the sessions held during the child's usual school hours, but on weekends rather than during school days. As with clinical subjects, these children were also randomly assigned to the control, verbal or nonverbal tapes with the restriction that equal numbers of these children view each of the video tapes. In all other respects, identical conditions prevailed for clinical and normal-control subjects during the pretest, mastery, and retest phases of

the sessions. These children were also rewarded with a sticker for their time and thanked for volunteering before being returned to the care of their parents.

### Schematic Summary

	Subtype I	$VIQ < PIQ$
	Subtype II	$VIQ > PIQ$
	Subtype III	$VIQ = PIQ$
	BD	$VIQ = PIQ$
	SL	$VIQ = PIQ$ (low average range)
Hypothesis	1.	BSAG Total: $BD > LD, BD > SL$
Hypothesis	2.	BSAG Ratio: $BD > LD, BD > SL$
Hypothesis	3.	BSAG Ratio: $LD > SL$
Hypothesis	4.	SBA Skill domain deficits: $SL > LD > BD$
Hypothesis	5.	SBA Performance domain deficits: $BD > LD > SL$
Hypothesis	6.	SCRS Self-control domain deficits: $BD > LD > SL$
Hypothesis	7.	Pretest Accuracy: $N = BD > LD > SL$
Hypothesis	8.	Pretest Attentiveness: $\frac{N + BD + SL}{3} > LD$
Hypothesis	9.	BSAG Ratio: $\frac{I + III}{2} > II$
Hypothesis	10.	SBA Performance domain deficits: $II > \frac{I + III}{2}$
Hypothesis	11.	SCRS Self-control domain deficits: $\frac{I + III}{2} > II$
Hypothesis	12.	Subtype I Verbal vs Nonverbal deficits: $V > NV$
Hypothesis	13.	Subtype II Verbal vs Nonverbal deficits: $NV > V$
Hypothesis	14.	Pretest Attentiveness $\frac{I + II}{2} > III$
Hypothesis	15.	Subtype I Verbal vs Nonverbal training: $V > NV$
Hypothesis	16.	Subtype II Verbal vs Nonverbal training: $NV > V$

## CHAPTER FIVE

## RESULTS

Subject Variables

Rejected Subjects. A total of 33 referred children were rejected as subjects before a complement of 12 subjects for each of the five clinical groups was secured. This figure included 8 SL, and 13 BD referrals who showed poor academic achievement, and 11 LD referrals (2 subtype I, 8 subtype II, and 1 subtype III) who failed to obtain at least one achievement deficit of sufficient magnitude. The remaining rejected referral was a potential BD subject who was expelled just prior to his scheduled testing date.

To assess differences in the frequencies with which referred children met the criteria adopted for the three major clinical subject divisions (i.e., BD, SL, LD), a  $\chi^2$  test was computed using the total number of rejected subjects distributed proportionately among these divisions according to sample size as the expected frequency. The obtained statistic,  $\chi^2(2, N = 60) = 5.2, p > .05$ , failed to reach statistical significance, indicating that BD, SL and LD referrals were rejected with comparable frequencies. A  $\chi^2$  analysis was also computed on rejected LD referrals using the total number of rejected referrals proportioned equally among the three subtypes as the expected frequency. The obtained result,  $\chi^2(2, N = 36) = 7.74, p < .05$ , reached statistical significance indicating that subtype II children had been disproportionately rejected.

Age Levels. To insure that the subject groups studied were of comparable chronological age, a single-factor analysis of variance was performed upon the chronological ages of the six ( $n = 12$ ) participating groups. Their ages are summarized in Table 1. The analysis of variance failed to reach statistical significance,  $F(5, 66) = 1.02$ ,  $p > .05$ , indicating that the mean chronological ages of the samples employed did not differ significantly.

To assess the significance of the differences in mental ages of the six subject groups employed, a mental age was calculated for each subject in the five clinical groups from his reported Full Scale IQ score. These scores were then analyzed in a single-factor analysis of variance along with the chronological ages of the 12 normal subjects, under the assumption that the mental age of each normal subject would equal his chronological age. The obtained means and standard deviations are reported in Table 2.

The  $F$  obtained reached statistical significance,  $F(5, 66) = 4.0$ ,  $p < .05$ . Pairwise comparisons using the Newman-Keuls test were performed on the mean scores for each of the six groups. These comparisons revealed that the SL group was inferior to all other subject groups ( $ps < .05$ ), but that the five remaining groups did not differ appreciably ( $ps > .05$ ) from one another in terms of their mean mental age.

Table 1

Chronological Age: Means and Standard Deviations ofAll Participating Subject Groups

Group	Mean (months)	Standard Deviation (months)
Normals	121.7	8.06
Slow Learners	128.0	10.15
Behaviourally Disordered	128.0	13.27
Subtype I	126.0	12.84
Subtype II	120.6	14.37
Subtype III	127.9	10.53

Table 2

Mental Age: Means and Standard Deviations ofAll Participating Subject Groups

Group	Mean (months)	Standard Deviation (months)
Normals <sup>1</sup>	121.7	8.06
Slow Learners	108.0	8.50
Behaviourally Disordered	130.1	11.75
Subtype I	124.4	15.65
Subtype II	122.2	16.87
Subtype III	126.8	13.51

<sup>1</sup> Chronological age was used as an estimate of mental age for Normal subjects



Achievement Levels. To examine differences in the overall achievement of the clinical groups, the percentile scores they obtained on the three subtests of the Woodcock-Johnson were transformed to standard scores ( $\underline{M} = 100$ ;  $\underline{SD} = 15$ ) and a mean standard score calculated for each subject. These scores are summarized in Table 3. The resulting mean achievement scores were subjected to a single-factor analysis of variance. The  $\underline{F}$  obtained was highly significant,  $\underline{F}(4, 55) = 19.62, p < .001$ . Subsequent comparisons using the Newman-Keuls test revealed:

- a) that the mean achievement of both the SL and BD groups was significantly above ( $p < .01$ ) the mean achievement levels of each of the LD subtypes;
- b) that the mean achievement of subtype III was significantly below ( $p < .05$ ) that of subtype II; and
- c) that the mean achievement of subtype I was intermediate to that of subtype II and III, but not statistically different ( $p > .05$ ) from either.

To examine differences in the Reading achievement of the three LD subtypes, standard score transformations of their obtained Reading percentile scores were also analyzed in a single-factor analysis of variance. The analysis revealed that the subtypes are comparable in their mean Reading achievement levels,  $\underline{F}(2, 33) = 1.01, p > .05$ .

Standard score equivalents of the obtained percentile scores were similarly analyzed to examine differences in the Mathematics achievement of the three LD subtypes. The  $\underline{F}$  obtained reached statistical significance,  $\underline{F}(2, 23) = 7.7, p < .01$ . Subsequent comparisons using the Newman-Keuls test showed that subtype II children were significantly

better in Mathematics than both subtype I and subtype III students ( $p < .01$ ). However, subtypes I and III did not differ in their obtained Mathematics achievement levels ( $p > .05$ ).

Finally, standard score equivalents of their obtained percentile scores were also employed and similarly tested to examine differences in the Written Language achievement of the three LD subtypes. This analysis showed that the LD subtypes do not differ in their achievement on the Written Language cluster of the Woodcock-Johnson,  $F(2, 33) = 1.66$ ,  $p > .05$ .

Achievement Deficits. To further assess achievement differences between and within the LD subtypes, the number of children within each subtype obtaining appreciable ability-achievement discrepancies (i.e., scores below the 16th percentile for their mental age) was tallied for each of the academic areas assessed. These figures are reported as percentages in Table 4. A number of between-group  $\chi^2$  analyses were completed on these data. However, they failed to show any significant differences between the subtypes in their total number of deficits, or in the number of deficits the three subtypes obtained in Reading, Mathematics or Written Language. A second series of  $\chi^2$  analyses also failed to detect any notable differences within either of the three subtypes in the number of deficits they obtained in the three academic areas assessed ( $ps > .05$ ).

Table 3

Standard Achievement Scores: Means and Standard Deviations for Five  
Clinical Groups in Reading, Mathematics, Written Language and  
Mean Achievement

---

Group		Mean Achievement	Reading	Mathematics	Written Language
Slow Learners	<u>M</u>	96.20	97.40	95.50	96.20
	<u>SD</u>	3.48	4.81	5.73	3.23
Behaviourally Disordered	<u>M</u>	94.80	95.60	93.75	95.10
	<u>SD</u>	2.87	3.87	2.60	4.89
Subtype I	<u>M</u>	85.00	89.50	77.90	87.60
	<u>SD</u>	6.68	12.04	7.24	10.87
Subtype II	<u>M</u>	88.50	85.80	92.60	86.90
	<u>SD</u>	3.55	5.70	13.31	6.73
Subtype III	<u>M</u>	83.10	84.30	82.30	81.80
		6.16	9.02	5.91	7.15

---

Table 4

Percentage of LD Subtype Members Showing Achievement Deficits in  
Reading, Mathematics, and Written Language

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		Reading	Mathematics	Written Language
		<hr/>		
Subtype	I	50.0	91.7	50.0
Subtype	II	41.7	33.3	41.7
Subtype	III	66.7	66.7	75.0

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### Instruments

Derived Scale Validity. A number of Pearson product-moment correlations were computed on the data for all clinical subjects combined, to examine the extent to which deficits obtained on the Verbal and Nonverbal items drawn from the SBA and the SCRS reflect a child's social behaviour as assessed by these instruments in their entirety. The obtained correlations are reported in Table 5 for each of the three social skill domains, and are presented along with the intercorrelations of the obtained Verbal and Nonverbal results for each domain.

With one notable exception, the results of the derived Verbal and Nonverbal scales correlate strongly with the total number of deficits obtained in each domain, while remaining only moderately intercorrelated with each other on each of these domains. In general, this outcome indicates that the derived scales are useful measures of a child's social behaviour, and that these derived scales assess rather different forms of behaviour. The important exception is the relatively weak relationship ( $r=.51$ ) between total skill deficits and Nonverbal skill deficits. This raises some concern regarding the value of the Nonverbal scale drawn from the SBA in assessing nonverbal skill-domain deficits.

Table 5

Correlations of Total Deficits With Verbal and Nonverbal Deficits and  
the Intercorrelations of Verbal and Nonverbal Deficits for Each  
Social Skill Domain

	DOMAIN		
	Skill	Performance	Self-Control
Total Deficits with Verbal Scale Deficits	.94	.93	.80
Total Deficits with Nonverbal Scale Deficits	.51	.82	.82
Intercorrelation of Deficits on Verbal and Nonverbal Scales	.31	.65	.65

Confounding of Domain Deficits. To examine the extent to which performance domain deficits are confounded with skill domain deficits, since both are assessed by the SBA scale, correlations were calculated between the total number of deficits obtained by each clinical group on: the skill and performance domains; the skill and self-control domains; and also the performance and self-control domains. These correlations were then rank ordered within each of the five clinical groups, and subjected to the Friedman test in order to examine the inter-relationships of the results for the three domains across all clinical groups. The obtained correlations and their rank orders within each of the clinical groups are reported in Table 6.

The results of the Friedman analysis of their rank orders failed to reach statistical significance,  $\chi^2_r (k = 3, N = 5) = 5.2, p > .05$ . This indicates that the skill and performance domains are no more confounded than is true of the skill and self-control, or the performance and self-control domain. Given this outcome, and the fact that the self-control domain is assessed by a different instrument, it appears that skill and performance-domain deficits are not significantly confounded and therefore can be interpreted without qualification.

Table 6

The Intercorrelations of Total Skill, Performance and Self-ControlDomain Deficits and Their Rank Orders Within Five Clinical Groups


---

Group	Skill-Performance		Skill-Self-Control		Performance-Self-Control	
I	.73	(2)	.38	(1)	.78	(3)
II	.29	(1)	.41	(3)	.38	(2)
III	-.45	(1)	.41	(2)	.73	(3)
BD	.40	(1)	.40	(2)	.88	(3)
SL	.37	(2)	.28	(1)	.81	(3)

---



### Testing the Uniqueness Assumption

#### Behaviour Problems

To assess differences in the prevalence of behaviour problems exhibited by the three major clinical groups (i.e., LD, BD, SL), a single-factor analysis of variance was completed upon their obtained total BSAG scores which are summarized in Table 7. The results of this analysis reached statistical significance,  $F(4, 55) = 8.63, p < .001$ . Planned comparisons revealed that the BD, who were selected partially on the basis of their Over-reacting and Under-reacting percentile scores, do exhibit significantly more total BSAG behaviour problems than the LD subtypes combined,  $F(1, 55) = 21.55, p < .001$ , and also more total BSAG behaviour problems than SLs,  $F(1, 55) = 28.19, p < .001$ . A Scheffé post hoc comparison showed the LD did not differ significantly from SLs,  $F_S(1, 55) = 1.82, p > .05$ , in the number of behaviour problems they display. However, the total BSAG scores for the SL group exhibited somewhat more variability than those of all other groups. In general, this outcome confirms that a mixed diagnosis for the LD and SL groups (i.e., LD/BD, SL/BD) is not warranted and also provides support for hypothesis 1 in showing that the BD exhibit significantly more behaviour problems than the LD or SLs.

In order to examine the behaviour problems of these clinical groups from a more qualitative viewpoint, behaviour problem ratios were calculated from the results they obtained on the Over-reacting and Under-reacting scales of the BSAG. This was achieved by converting each child's obtained percentile score on each of these scales to standard score equivalents ( $\underline{M} = 100, \underline{SD} = 15$ ), and then dividing his Over-reacting

Table 7

Bristol Social Adjustment Guides: Mean Total Scores and  
Standard Deviations for Five Clinical Groups

Group	TOTAL SCORES	
	Mean	Standard Deviation
Slow Learners	7.50	8.33
Behaviourally Disordered	22.08	5.47
Subtype I	12.00	7.03
Subtype II	9.80	6.48
Subtype III	10.08	6.10

standard score by his Under-reacting standard score. The resulting Over-reacting:Under-reacting ratios were then analyzed in a single-factor analysis of variance. The obtained means and standard deviations are reported in Table 8.

The  $F$  obtained achieved statistical significance,  $F(4, 55) = 3.05$ ,  $p < .05$ . Planned comparisons revealed that the BD exhibit significantly higher Over-reacting:Under-reacting ratios than both the LD,  $F(1, 55) = 9.03$ ,  $p < .001$ , and SLs,  $F(1, 55) = 4.56$ ,  $p < .05$ , while the LD do not differ from SLs in this regard,  $F(1, 55) = 0.15$ ,  $p > .05$ . This outcome provides support for hypothesis 2 in showing that the BD exhibit significantly higher proportions of over-reacting to under-reacting behaviour problems than the LD and also SLs. However, it fails to support hypothesis 3 in that the LD do not show higher proportions of over-reacting behaviour problems than SLs.

Table 8

Bristol Social Adjustment Guides: Mean Ratio Scores and  
Standard Deviations for Five Clinical Groups

Group	RATIO SCORES	
	Mean	Standard Deviation
Slow Learners	1.06	0.13
Behaviourally Disordered	1.18	0.18
Subtype I	0.99	0.13
Subtype II	1.03	0.15
Subtype III	1.10	0.12

### Social Deficit Profiles

To compare the social deficits of the LD, BD and SLs across the three social domains, the total number of skill, performance and self-control deficits each child obtained were first converted to percentage scores to equate for differences in the number of items available to assess these domains. This was accomplished by dividing the total number of each deficit type each child obtained, by the total number of items available to assess that domain; and multiplying the result by 100. In the case of the skill and performance domains, the 136 items of the SBA were available. In the case of the self-control domain, only the 30 items of the SCRS were available. These percentage scores were then analyzed in a 5 (groups)  $\times$  3 (domains) analysis of variance with repeated measures on the domains factor. This analysis is reported in Table 9. The obtained means and standard deviations appear in Table 10. However, in order to facilitate the discussion of contrasts involving the three major clinical groups, the means obtained by the three LD subtypes have been combined and are presented with those of the BD and SLs in Figure 2.

As Table 9 shows, the expected group effect,  $F(4, 55) = 20.04$ ,  $p < .001$ , and group by domain interaction,  $F(8, 110) = 2.75$ ,  $p < .01$ , both reached statistical significance. However, the obtained results differ importantly from expectation in that the LD, BD and SL groups are all comparably skill deficient ( $ps > .05$ ). Nevertheless, additional planned comparisons showed that SLs are much less performance deficient than the LD,  $F(1, 55) = 5.99$ ,  $p < .025$ , and that the LD are significantly less performance deficient than the BD,  $F(1, 55) = 26.68$ ,  $p < .001$ . Finally, planned comparisons also showed that SLs are less self-control deficient

than the LD,  $F(1,55) = 16.61$ ,  $p < .001$ , who are, in turn, less self-control deficient than the BD,  $F(1, 55) = 70.01$ ,  $p < .001$ . Thus, these results provide clear support for hypotheses 5 and 6 in showing that the three groups differ significantly from each other in their performance-domain and self-control-domain deficits. However, hypothesis 4 is without support. This appears to be largely due to the marked variability in the skill domain deficits of the SL group.

A number of Scheffé post hoc tests were subsequently used on these deficit percentage scores to compare the groups in terms of the total number of social deficit ratings they obtained. These tests revealed that the BD obtain significantly more social deficit ratings than the LD,  $F_S(1, 55) = 120.36$ ,  $p < .001$ , who, in turn, obtain significantly more deficit ratings than SLs,  $F_S(1, 55) = 178.35$ ,  $p < .001$ . In addition to this, within-group post hoc Scheffé comparisons revealed:

- a) that SLs are no more performance deficient than skill deficient,  $F_S(1, 11) = 6.32$ ,  $p > .05$ , and no more self-control deficient than performance deficient,  $F_S(1, 11) = 5.43$ ,  $p > .05$ ,
- b) that the BD are more performance deficient than skill deficient,  $F_S(1, 11) = 47.39$ ,  $p < .01$ , but not more self-control deficient than performance deficient,  $F_S(1, 11) = 3.65$ ,  $p > .05$ , and
- c) that the LD are significantly more performance deficient than skill deficient,  $F_S(1, 35) = 78.06$ ,  $p < .001$ ; and also significantly more self-control deficient than performance deficient,  $F_S(1, 35) = 32.20$ ,  $p < .01$ .

In other words, from a statistical point of view, SLs have a relatively flat profile of deficits across the three domains. The BD profile, on the other

Table 9

Analysis of Variance: Percentage of Items Scored As Deficits on the  
Skill, Performance and Self-Control Domains by Five Clinical Groups

---

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Total	104224.95	179			
A (groups)	4496.31	4	1124.01	20.04	<.001
S/A	30853.30	55	56.09		
B (domains)	45838.43	2	22919.00	131.31	<.001
A x B	3837.46	8	479.68	2.75	<.01
B x S/A	19199.45	110	174.54		

---

hand, reaches a plateau at the performance domain. In contrast to both, the LD display an increasing profile of deficits across the three social domains.

### Pretraining Measures

In order to compare the three major clinical groups in their accuracy on the social perception task developed for the study, the number of items (out of a maximum of five) correctly identified on the first block of the pretest and the first block of the post test were tallied for all subjects of each of the six participating groups. These scores, which are reported in Table 11, were analyzed in a 6 (groups) x 3 (training: control, verbal, nonverbal) x 2 (pre/post) analysis of variance with repeated measures on the training and pre/post factors. This analysis is reported in Table 12.

Planned comparisons of the pretest means confirmed that the BD are as accurate on the task as normals,  $F(1, 54) = 1.39, p > .05$ , and that the LD are inferior to both normals,  $F(1, 54) = 29.73, p < .001$ , and the BD,  $F(1, 54) = 16.08, p < .001$ . However, contrary to expectation, SLs performed comparably to both normals,  $F(1, 54) = 1.39, p > .05$ , and the BD,  $F(1, 54) = 0.0, p > .05$ , and were significantly more accurate on the pretest social perception task than the LD,  $F(1, 54) = 16.08, p < .001$ . In addition, exploratory contrasts between the three LD subtypes on the pretest means showed that subtypes II and III performed equally well (Newman-Keuls,  $p > .05$ ), but both were significantly more accurate than subtype I (Newman-Keuls,  $p < .01$ ) on the task. Taken together, these results indicate that prior to training, the social perception task was



Table 10

Mean Total Deficit Percentage Scores and Standard Deviations for  
Five Clinical Groups Across the Skill Performance  
and Self-Control Domains

Group		DOMAIN		
		Skill	Performance	Self-Control
Slow Learners	<u>M</u>	5.58	19.33	30.75
	<u>SD</u>	5.79	20.37	28.53
Behaviourally Disordered	<u>M</u>	2.00	38.33	56.33
	<u>SD</u>	2.49	19.19	19.89
Subtype I	<u>M</u>	2.83	28.33	48.33
	<u>SD</u>	3.81	17.23	30.36
Subtype II	<u>M</u>	2.33	24.33	31.17
	<u>SD</u>	3.75	13.19	17.47
Subtype III	<u>M</u>	3.17	23.67	42.75
	<u>SD</u>	3.64	15.45	23.23
LD Subtypes	<u>M</u>	2.78	25.44	40.92
	<u>SD</u>	3.64	15.08	24.59

Table 11

Accuracy Scores: Means and Standard Deviations For Six Groups  
On the Pretest and Post Test Under Three Training Conditions and  
Combined Group Means and Standard Deviations Collapsed Across  
Treatment Conditions

		TRAINING							
		Control		Verbal		Nonverbal		Combined	
		<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Group									
N	pre	4.00	0.82	3.75	0.96	4.00	0.82	3.92	0.79
	post	4.00	0.82	4.25	0.96	4.75	0.50	4.33	0.78
SL	pre	3.25	0.50	3.25	1.71	4.50	0.58	3.67	1.15
	post	3.75	0.96	3.50	0.58	3.75	0.50	3.67	0.65
BD	pre	3.75	0.96	3.25	0.50	4.00	1.15	3.67	0.89
	post	3.25	0.50	4.50	0.58	2.50	1.29	3.42	1.16
LD I	pre	2.50	0.58	2.25	1.50	2.25	0.96	2.33	0.98
	post	3.00	1.63	4.25	0.96	4.50	1.00	3.92	1.31
LD II	pre	3.00	0.82	3.25	0.50	4.00	0.82	3.42	0.79
	post	2.50	0.58	4.25	0.96	3.00	0.82	3.25	1.06
LD III	pre	3.00	0.00	2.75	0.50	3.75	0.50	3.17	0.58
	post	2.75	0.50	3.50	0.58	4.50	0.58	3.58	0.90

Table 12

Analysis of Variance: Pretest and Post Test Accuracy Scores for Six  
Groups Under Three Training Conditions

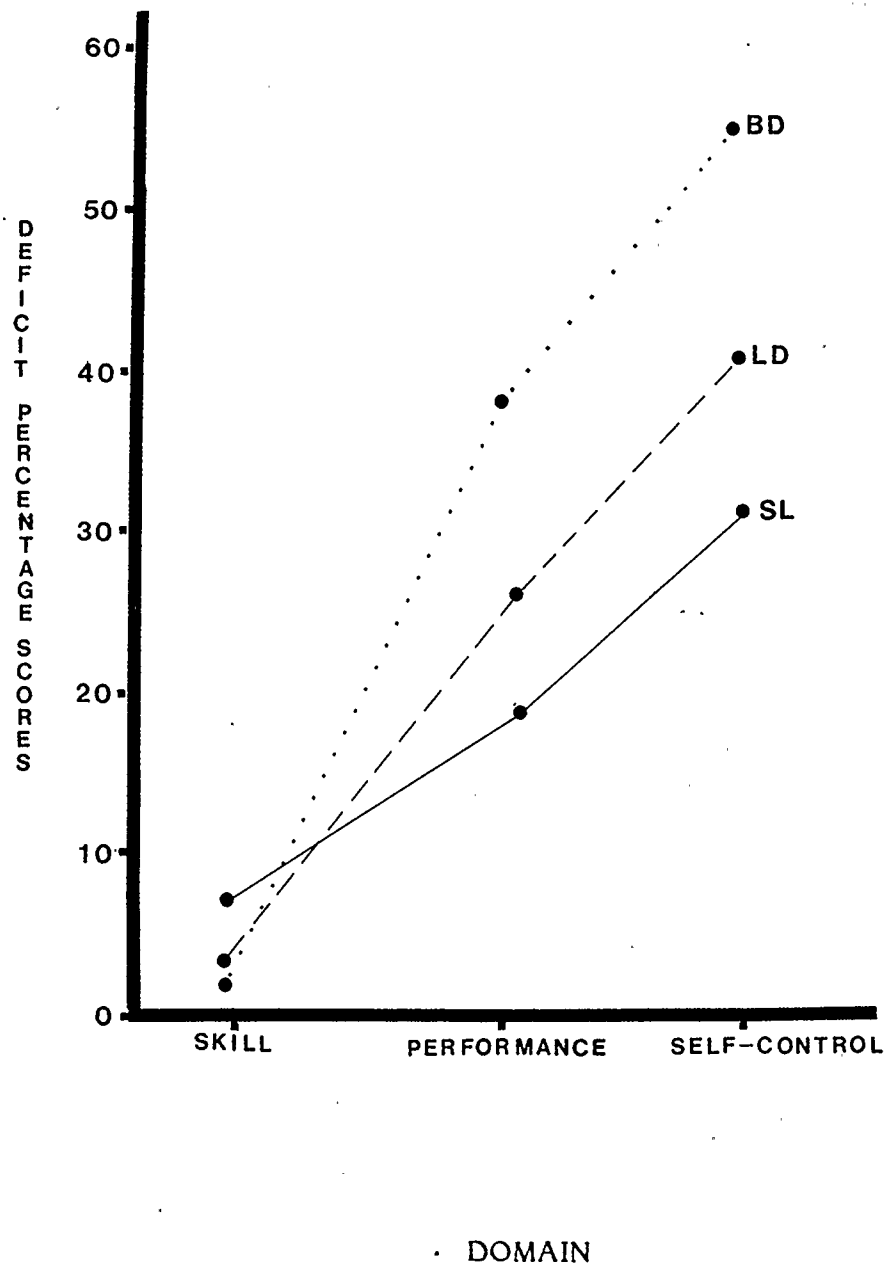
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Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
<hr/>					
Total	158.89	143			
A (groups)	14.39	5	2.88	3.57	< .01
B (training)	7.68	2	3.84	4.77	< .025
C (pre/post)	4.00	1	4.00	4.70	< .05
A x B	10.32	10	1.03	1.28	ns
A x C	13.67	5	2.73	3.21	< .025
B x C	7.13	2	3.56	4.18	< .025
A x B x C	12.21	10	1.22	1.43	ns
S/AB	43.50	54	0.81		
C x S/AB	46.00	54	0.85		

---

Figure 2

Mean Deficit Percentage Scores for the LD, BD and SLs Across the Skill, Performance and Self-Control Domains



appreciably more difficult for the LD than all other subject groups. This appears to be particularly true of subtype I subjects. However, these results do not provide unqualified support for hypothesis 7 because SLs were not inferior to the LD on the task.

The final test of the uniqueness assumption focused upon the attentiveness of the three major clinical divisions. The consistency of a subject's correct responses was employed as a measure of attentiveness. For each subject, this was assessed on the pretest, and again following training, on the post test, as a conditional probability (i.e.,  $p_{\text{hit}|\text{hit}}$ ) based upon the correspondence of his correct responses between the first and second blocks of five identical test items which were presented in different random orders. The obtained  $p_{\text{hit}|\text{hit}}$  scores were calculated as the proportion of items a subject correctly identified during the second block of five items given that he had also identified those items correctly when they appeared moments earlier, during the first block of five items. The  $p_{\text{hit}|\text{hit}}$  scores obtained by each of the six subject groups participating in training are summarized in Table 13. These scores were analyzed in a 6 (groups) x 2 (pre/post) analysis of variance with repeated measures on the pre/post factor. This analysis is reported in Table 14.

Planned comparisons of the pretest results showed that the LD were significantly less attentive than normals,  $F(1, 66) = 11.03$ ,  $p < .01$ , but no less attentive than the BD,  $F(1, 66) = 0.05$ ,  $p > .05$ , or SLs,  $F(1, 66) = 1.34$ ,  $p > .05$ . Therefore, this outcome does not provide unqualified support for hypothesis 8 since the LD were not also less attentive than the other clinical groups.

Table 13

Conditional Probability Scores: Means and Standard Deviations For Six  
Groups On the Pretest and Post Test Items

Group	Pretest		Post Test	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Normals	.90	0.15	.93	0.12
Slow Learners	.76	0.27	.88	0.17
Behaviourally Disordered	.70	0.22	.91	0.17
Subtype I	.73	0.31	.90	0.13
Subtype II	.75	0.19	.88	0.18
Subtype III	.56	0.32	.98	0.07

Table 14

Analysis of Variance: Pretest and Post Test Conditional Probability  
Scores For Six Subject Groups

---

Source	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Total	7.60	143			
A (groups)	0.03	5	0.06	1.49	ns
B (pre/post)	1.21	1	1.21	45.15	< .001
A x B	1.66	5	0.33	12.38	< .001
S/A	2.66	66	0.04		
B x S/A	1.77	66	0.03		

---

### Testing the Heterogeneous Assumption

#### Behaviour Problems

The first test of subtype-specificity in the behaviour of the three LD subtypes focused upon their obtained BSAG ratio scores which were reported in Table 8. Planned comparisons of these scores revealed that subtypes I and III do not exhibit higher over-reacting to under-reacting behaviour problem ratios than subtype II,  $F(1, 55) = 0.09$ ,  $p > .05$ . Moreover, pairwise post hoc contrasts showed that the subtypes are also alike in the total number of behaviour problem ratings they obtained on the BSAG, as well as in the scores they obtained on both the Over-reacting and Under-reacting scales of this instrument (Newman-Keuls,  $ps > .05$ ). Together, these results indicate that the subtypes are seen by their teachers as being very similar in terms of the number and nature of their behaviour problems. Accordingly, they fail to support hypothesis 9.

#### Social Deficit Profiles

Figure 3 presents the means of the total deficit percentage scores for the three LD subtypes which were reported in Table 10 and collapsed in Figure 2. Post hoc comparisons between the subtypes on their skill domain results revealed that the three subtypes are comparably skill deficit (Newman-Keuls,  $ps > .05$ ). In addition, planned contrasts of the performance domain results revealed that subtype II is no more performance deficient than the other subtypes,  $F(1, 55) = 0.39$ ,  $p > .05$ . However, subtype II was significantly better self-controlled than both subtype I,  $F(1, 55) = 29.7$ ,  $p < .001$ , and subtype III,  $F(1, 55) = 13.14$ ,  $p < .001$ , while subtypes I and III were comparably self-control deficient

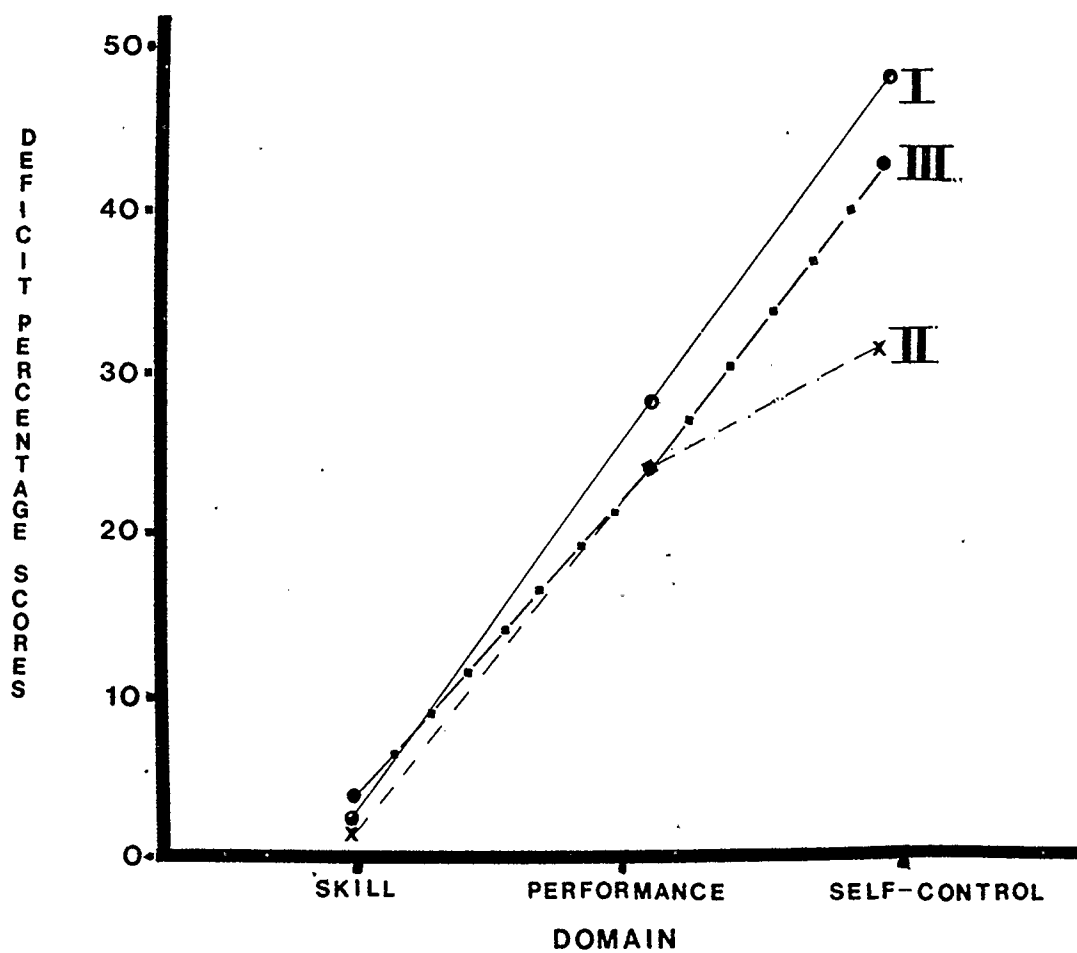


(Newman-Keuls,  $p > .05$ ).

Further exploratory within-group contrasts of the total deficit percentage scores revealed that subtypes I and III both obtain significantly fewer skill-domain than performance-domain deficits; and significantly fewer performance-domain than self-control-domain deficits (Newman-Keuls,  $p_s < .01$ ). Subtype II is similar in obtaining more performance deficits than skill deficits, however, they differ in being equally self-control and performance deficient (Newman-Keuls,  $p > .05$ ). Finally, post hoc contrasts between the subtypes showed that subtype I obtains more social deficits overall than subtype III (Newman-Keuls,  $p < .01$ ) who, in turn, obtains more social deficits than subtype II (Newman-Keuls,  $p < .01$ ). In summary, these results show a) that subtype I is less socially skilled than subtype III who, in turn, is less socially skilled than subtype II, and b) that these differences are largely due to the superior self-control of subtype II children. Accordingly, these results provide support for hypothesis 11 in showing that subtype II is the least self-control deficient of the three subtypes. However, they fail to support hypothesis 10 since subtype II did not obtain more performance-domain deficits than the other LD subtypes.

Figure 3

Mean Deficit Percentage Scores for Three LD Subtypes Across Three  
Social Domains



Percentage scores were also calculated for skill, performance and self-control deficits obtained on the derived Verbal and Nonverbal scales to further assess subtype-specificity in the social behaviour of the three LD subtypes. The procedure employed was identical to that used to calculate total deficit percentage scores. However, since a total of 44 Verbal and 29 Nonverbal items were drawn from the SBA, these figures represented the divisors for Verbal and Nonverbal deficit percentage scores for the skill and performance domains, respectively. In the case of the self-control domain, 5 Verbal and 5 Nonverbal items were drawn from the SCRS. Accordingly, 5 served as the divisor for both Verbal and Nonverbal self-control deficit percentage scores. The resulting Verbal and Nonverbal deficit percentage scores were then analyzed for the three LD subtypes in a 3 (subtypes) x 3 (domains) x 2 (items) analysis of variance with repeated measures on the domains and items factors. This analysis is summarized in Table 15, and the obtained means are presented in Table 16 and Figure 4.

As Table 15 shows, the expected significant subtype x items interaction failed to emerge,  $F(2, 33) = 0.16, p > .05$ . Neither subtype I,  $F(1, 33) = 0.02, p > .05$ , nor subtype II,  $F(1, 33) = 0.51, p > .05$ , displayed significantly more Verbal or Nonverbal deficits. However, a significant three-way interaction did appear. An analysis of the simple interaction effects, which is reported in Table 17, identified the self-control domain as the primary source,  $F(2, 33) = 3.30, p < .05$ , of the subtype x domains x items effect. Subsequent contrasts involving the self-control means showed that the three subtypes did not differ on Verbal items ( $ps > .05$ ), but that subtype I was more poorly self-controlled than the other subtypes

combined on Nonverbal items,  $F(1, 33) = 4.79, p < .05$ . In the main, these results suggest that Verbal-Nonverbal differences in the cognitive abilities of these groups are not strongly reflected in their rated social deficits. Accordingly, they fail to provide substantial support for hypothesis 13 or hypothesis 14.

### Pretraining Measures

Planned contrasts were performed upon the mean pretest  $p$  hit\hit scores reported for the LD subjects in Table 13 to compare the attentiveness of the three LD subtypes during the social perception task presented prior to training. These contrasts showed that subtype III children were significantly less consistent in repeating their correct responses than subtype I,  $F(1, 66) = 4.33, p < .05$ , or subtype II children,  $F(1, 66) = 5.42, p < .025$ . However, subtypes I and II did not differ on this measure,  $F(1, 66) = 0.06, p > .05$ . This outcome provides clear support for hypothesis 14 in showing that subtype III is much less attentive than the other LD subtypes.

### Testing the Validity of the LD Subtypes For Training

#### Outcome Data

Differential training outcomes for the LD subtypes represented the focus of interest for the training portion of the study, since a finding of this nature would offer some suggestion that these LD subtypes may represent valid groupings of LD students for social skill training. Accordingly, the post test accuracy scores obtained by subtypes I, II and III were analyzed in a 3 (subtypes) x 3 (training: control, verbal, nonverbal)

completely randomized analysis of variance to isolate and assess the interactive effects of these subtypes with the training programs employed. The obtained means appear in Figure 5 and are included in Table 11. The analysis is reported in Table 18.

As Table 18 shows, the expected subtype x training interaction achieved statistical significance,  $F(4, 27) = 3.38, p < .05$ . However, it differed from the interaction expected in several ways. First, both verbal and nonverbal training were superior to the control condition for subtype I (Newman-Keuls,  $ps < .05$ ). Second, subtype II performed significantly better under verbal training than the control condition (Newman-Keuls,  $p < .05$ ), but nonverbal training was no more effective for them than the control condition (Newman-Keuls,  $p > .05$ ). Finally, nonverbal training was superior to the control condition for subtype III (Newman-Keuls,  $p < .05$ ), but verbal training was not (Newman-Keuls,  $p > .05$ ). These results reveal that the effectiveness of the training programs does not systematically vary with the nature of the child's identified cognitive deficits; nor his identified verbal or nonverbal strengths. Consequently, they do not provide clear support for hypothesis 15 or 16 since subtypes I and II did not show the expected differential responsivity to verbal and nonverbal cues.

Table 15

Analysis of Variance: Verbal and Nonverbal Deficit Percentage Scores for  
LD Subtypes Across Three Social Domains

	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
<hr/>					
Source					
Total	85,935.84	215			
A (subtypes)	1753.00	2	876.50	1.26	ns
B (domains)	22,383.45	2	11,191.73	33.58	< .001
C (items)	13.50	1	13.50	0.08	ns
A x B	796.06	4	199.02	0.60	ns
A x C	45.45	2	27.73	0.16	ns
B x C	586.78	2	293.39	2.38	< .05
A x B x C	1,575.11	4	393.78	3.20	< .025
S/A	22,925.83	33	694.72		
B x S/A	21,995.51	66	333.27		
C x S/A	5,726.06	33	173.52		
B x C x S/A	8,135.11	66	123.26		

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Table 16

Mean Verbal and Nonverbal Deficit Percentage Scores for  
Three LD Subtypes Across the Skill, Performance and  
Self-Control Domains

Subtype	Domain	Mean	Standard Deviation
Verbal Items			
I	Skill	7.83	7.69
	Performance	31.25	14.56
	Self-Control	25.00	25.76
II	Skill	3.33	5.35
	Performance	21.33	18.20
	Self-Control	23.33	23.87
III	Skill	5.08	6.89
	Performance	16.17	15.75
	Self-Control	26.67	24.62
Nonverbal Items			
I	Skill	1.50	2.39
	Performance	23.58	15.22
	Self-Control	40.00	33.03
II	Skill	1.58	3.34
	Performance	21.08	14.55
	Self-Control	20.00	19.07
III	Skill	1.00	1.81
	Performance	20.08	14.11
	Self Control	26.67	24.62

Table 17

Simple Interaction Effects of the Subtype x Domains x Items Interaction

	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Source					
A x C at b1	63.03	2	31.52	0.18	ns
A x C at b2	413.08	2	206.54	1.19	ns
A x C at b3	1,149.49	2	574.75	3.31	< .05
C x S/A	5,727.06	33	173.52		



Table 18

Analysis of Variance: Post Training Accuracy Scores of Three LD  
Subtypes Under Control, Verbal and Nonverbal Training Conditions

	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Source					
Total	35.56	35			
A (subtypes)	2.73	2	1.37	2.84	ns
B (training)	13.36	2	6.68	13.92	< .001
A x B	6.47	4	1.62	3.38	< .05
S/AB	13.00	27	0.48		

Figure 4

Mean Verbal and Nonverbal Deficit Percentage Scores for Three LD  
Subtypes Across Three Social Domains

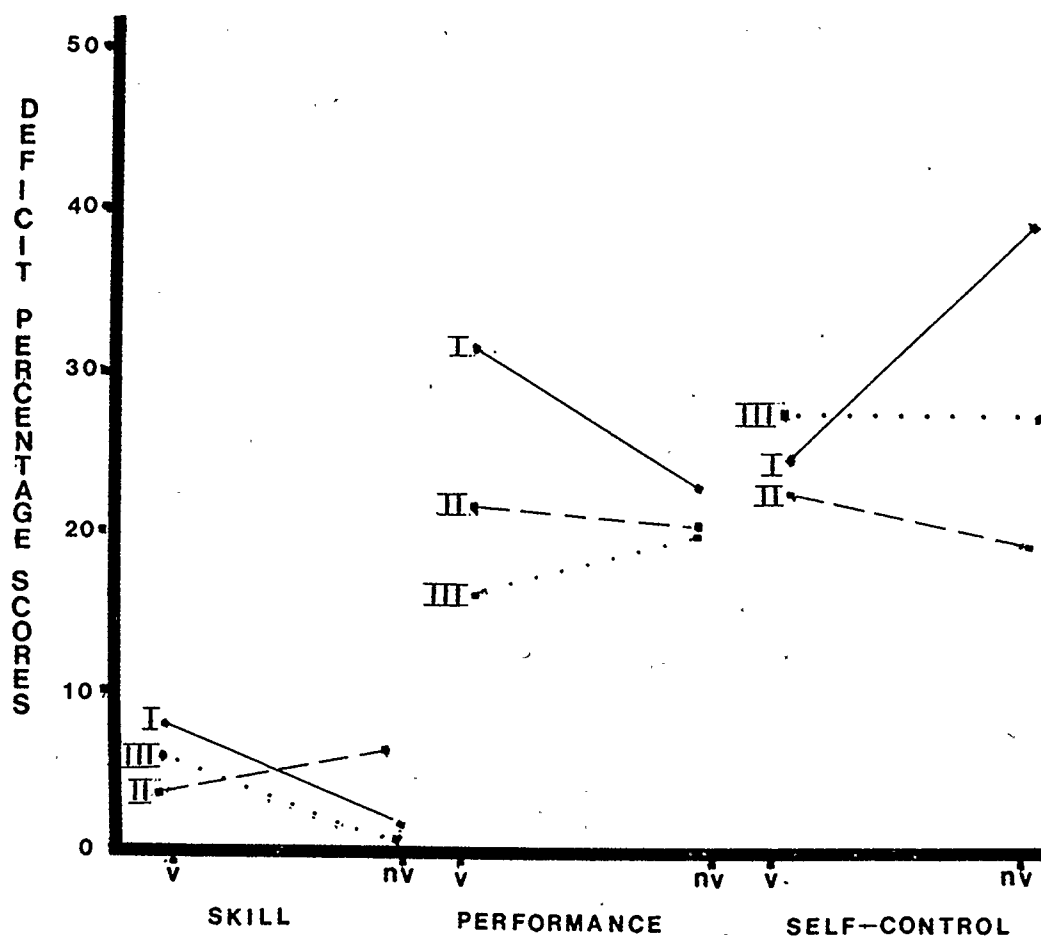
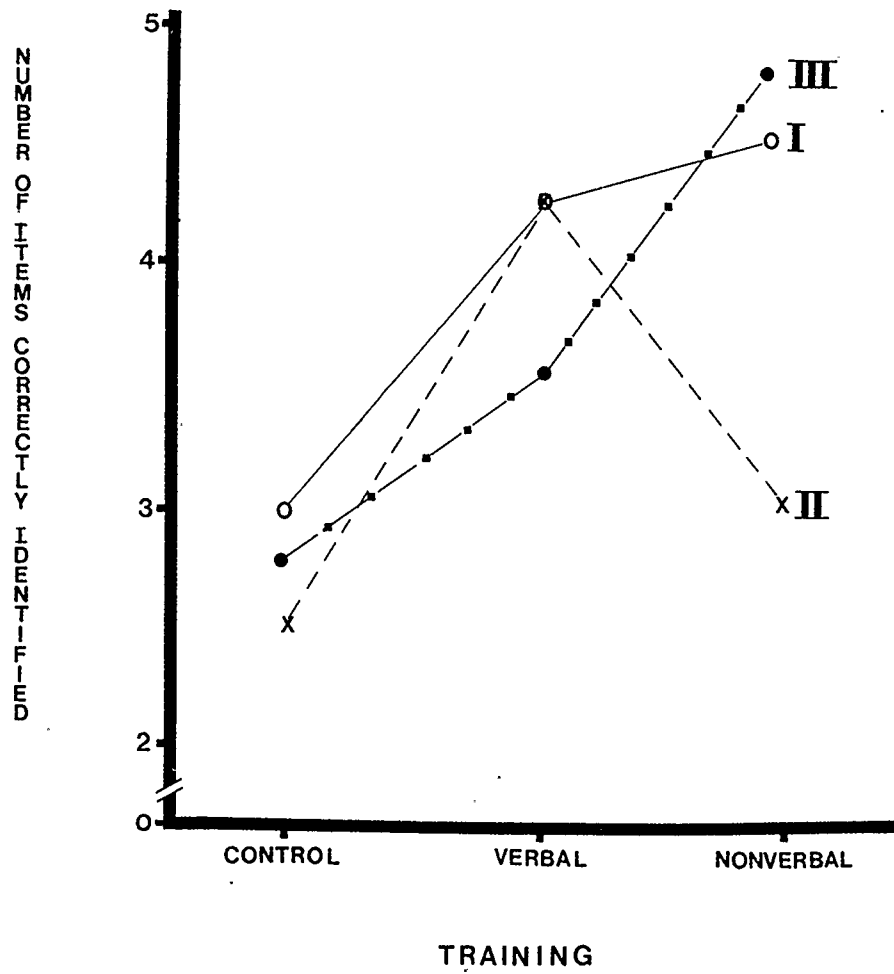


Figure 5

Mean Post Training Accuracy Scores for Three LD Subtypes Under Control, Verbal and Nonverbal Training



### Post Hoc Analysis of Outcome Data

In order to better assess the relative effectiveness of the verbal and nonverbal training programs, and also to explore the possibility of similar training response patterns in the comparison groups, post testing accuracy scores for normals, the BD, and SLs were combined with those of the LD reported above and similarly analyzed in a 6 (groups) x 3 (training) completely randomized analysis of variance. This analysis is reported in Table 19. The obtained means are included in Table 11 and appear in Figure 6 where the results for the LD have been averaged for the three subtypes.

Since a significant training effect was obtained,  $F(2, 54) = 6.25$ ,  $p < .01$ , contrasts were computed to localize its source. They revealed that both verbal (Newman-Keuls,  $p < .01$ ) and nonverbal training (Newman-Keuls,  $p < .05$ ) were superior to the control condition, with neither being more effective (Newman-Keuls,  $p > .05$ ). Within-group post hoc comparisons showed that neither SLs or normals improved appreciably under verbal or nonverbal training (Newman-Keuls,  $p > .05$ ); while the BD improved significantly only under verbal training (Newman-Keuls,  $p < .05$ ).

First, these results confirm that the training programs are both more effective than control training, and that the verbal and nonverbal training programs are equally effective. Second, they indicate that the training provided was only of value to LD and BD students. Third, they indicate that the results obtained by subtype II are not necessarily related to their discrepant verbal-nonverbal cognitive abilities since the BD showed a similar pattern of response to training.

To explore the possibility that the LD subtypes may have been responding differentially to specific and general effects of training, each subtype's verbal and nonverbal training outcomes were contrasted to see if the accuracy levels they achieved under these conditions differed significantly. The results of these contrasts showed that verbal training was not significantly more effective than nonverbal training for subtypes I or III (Newman-Keuls,  $p_s > .05$ ). However, verbal training was significantly more effective than nonverbal training for subtype II (Newman-Keuls,  $p < .05$ ). This outcome suggests that while subtype II benefited selectively from the verbal training program, subtypes I and III could conceivably have been responding to the training provided in a general way, rather than selectively to its focus upon verbal or nonverbal cues.

Since subtype III seemed the most likely of all subject groups to show general training effects reflected by improved attention, the pretest and post test  $p$  hit\hit scores for all six subject groups, which are reported in Table 11, were analyzed in a 6 (groups) x 2 (pre/post) analysis of variance with repeated measures on the pre/post factor. The analysis is reported in Table 20 and the obtained means appear in Figure 7.

Table 19

Analysis of Variance: Post Test Accuracy Scores for Six Groups Under Control, Verbal and Nonverbal Training

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	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
<hr/>					
Source					
Total	75.28	71			
A (groups)	8.94	5	1.79	2.48	< .05
B (training)	9.03	2	4.51	6.25	< .01
A x B	18.31	10	1.83	2.54	< .05
S/AB	39.00	54	0.72		

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Figure 6

Mean Post Test Accuracy Scores for the LD and All Comparison Groups  
Under Control, Verbal and Nonverbal Training

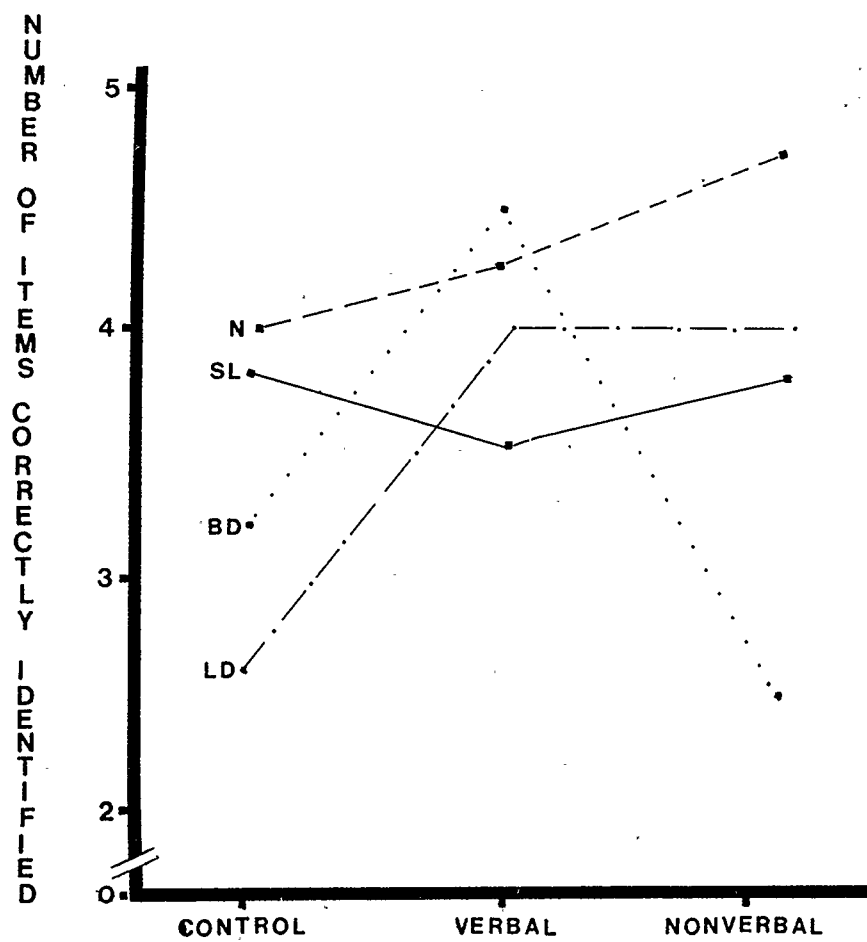
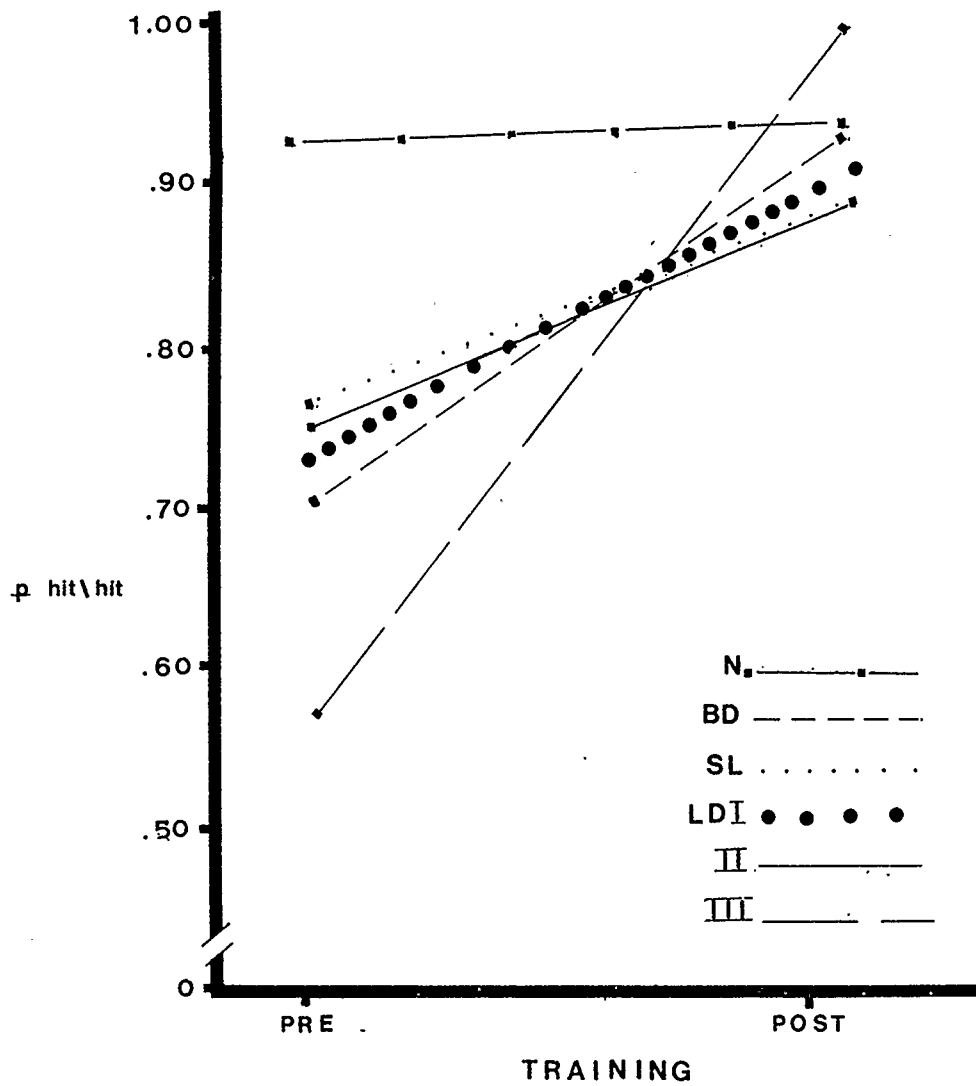


Figure 7

Mean Pretest and Post Test Conditional Probability Scores for  
Six Subject Groups





A series of between-group Newman-Keuls post hoc contrasts showed that all groups were equally attentive following training ( $ps > .05$ ). Additional within-group post hoc comparisons revealed that this comparability was achieved by subtypes I and III and the BD all making significant improvements in their attentiveness from the pretest to the post test (Newman-Keuls,  $ps < .01$ ) while the attentiveness of all the other subject groups remained unchanged (Newman-Keuls,  $ps > .05$ ). This outcome hints that the verbal and nonverbal training programs both may have served to address some features or characteristic that the BD, subtype I and subtype III have in common.

Table 20

Analysis of Variance: Pretest and Post Test Conditional Probability  
Scores for Six Groups

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	<u>SS</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
<hr/>					
Source					
Total	7.60	143			
A (groups)	0.30	5	0.06	1.49	ns
S/A	2.66	66	0.04		
B (pre/post)	1.21	1	1.21	45.15	< .001
A x B	1.66	5	0.33	12.39	< .001
B x S/A	1.77	66	0.03		

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## CHAPTER SIX

## DISCUSSION

Tests of the Uniqueness Assumption

Eight different hypotheses were developed to provide converging tests of the assumption that the LD are unique with regard to their maladaptive social behaviour. While the results did reveal that there are several areas where the social deficits of the LD overlap with those of SLs and the BD, they also provided appreciable support for the notion that the LD, as represented by subtypes I, II and III, exhibit not only quantitative, but also qualitative differences in their maladaptive social behaviour.

In brief, the BSAG data showed that the BD display significantly more behaviour problems and also exhibit higher Over-reacting:Under-reacting behaviour problem ratios than SLs or the LD, who do not differ on either of these measures. The results obtained on the SBA and the SCRS showed that the three groups differ significantly in their total number of social deficit ratings, and also in the number of deficit ratings they obtain on the performance and self-control domains, but not the skill domain. Finally, the pretest results showed that the LD are significantly more impaired in social perception than normals, the BD and SLs, but no less attentive than the BD or SLs during this task.

First, with regard to the behaviour problem ratings, the total BSAG scores separated the BD clearly from the LD and SLs. This showed that the LD and SL groups were not also behaviourally disordered and that their social deficits could therefore be justifiably associated with their

status as exceptional learners. The total BSAG scores also revealed that the LD and SL groups do not differ in the number of behaviour problems they display. On the other hand, the BSAG ratio scores revealed that the three groups were similar in their tendency to exhibit higher proportions of Over-reacting than Under-reacting behaviour problems. However, this tendency was significantly stronger in the BD groups. This indicates that the behaviour of the BD is likely to be more harmful, disruptive or annoying to others than that of the LD or SLs.

The SBA and SCRS results showed that the BD, LD and SLs differ importantly in both the elevation and shape of their social deficit profiles. In particular, SLs obtained the fewest social deficit ratings and, therefore, were seen as the most socially competent of the three groups studied. Their profile of deficit ratings across the three social domains was flat. This indicates that the skills which are available for use in their behavioural repertoire, the extent to which they use these available skills, and their ability to regulate their own social behaviour are all comparably developed. The BD were seen as the most socially deficient group since they obtained the greatest number of deficit ratings. Their profile of social deficits reached a plateau at the performance domain, indicating that the social behaviour of the BD equally reflects their failure to employ the skills which they do possess, and their failure to adequately self-regulate their social behaviour. The LD were seen as intermediate to the BD and SLs in their level of social skill according to their total deficit ratings. These children displayed an increasing profile of deficits across the skill, performance and self-control domains. Thus, impaired self-control appears to be the primary social difficulty of the

LD, however, they are also socially encumbered to an appreciable degree by their failure to use the social skills which they do possess.

The differences in the shapes of these social deficit profiles offer two possible accounts for the characteristic social behaviour of these groups. The first closely parallels Gresham's (1981a) conceptualization. To elaborate, since the social deficit profile of SLs is flat, it seems reasonable to conclude that a general factor, such as social immaturity, is likely responsible for their social deficit ratings across the three social domains. However, two additional factors seem necessary to explain the plateau in the BD social deficit profile. The first is a force serving to inhibit their use of socially desired behaviours. The second, which is of comparable strength, is a force serving to activate their use of socially undesirable behaviours. Both of these additional factors appear to be operative in the case of the LD. However, the activating factor appears to be much stronger and more influential in the social behaviour of these children than the inhibiting factor. Interestingly, since the LD are unique in this regard, and also in showing achievement far below expectation, it is tempting to speculate that this activating tendency in the LD may, in some way, be potentiated by, or associated with their ability-achievement discrepancies.

The second account employs only two factors. The first of these is, again, social immaturity which provides a background of deficits across the three social domains for the BD, LD and SLs alike. The second is self-control impairment. In this account, as self-control impairment increases, the opportunity for the performance of socially desired behaviours declines. Consequently, as the universe of behaviours sampled

becomes increasingly overshadowed by self-control deficits, performance-domain deficit ratings become increasingly more likely until both are rated at similar levels. Thus, the performance- and self-control-domain deficits of the BD do not differ because the BD are exceptionally self-control impaired. The LD display significantly fewer performance- than self-control-domain deficits because they are much less self-control impaired than the BD. In contrast, the social deficit ratings of SLs reflect only the general social immaturity factor.

The accuracy results on the pretest social perception task were consistent with a large number of studies which have shown that the LD are poorer than normals in their social perception skill (e.g., Axelrod, 1983; Bryan, 1977; Maitland, 1977; Maheady, Maitland & Sainato, 1982; Puckett, 1980; Stone & Greca, 1984; Wiis & Harris, 1974). These studies have also provided a good deal of suggestion that social perception ability may be closely related to intelligence. However, many of these studies are open to criticism based upon their failure to control for differences in the verbal skills of their subjects or to minimize the verbal demands imposed by the task employed. In addition, most of these studies failed to control for, or assess differences due to attention. Few provided the IQ ranges of the children involved, and none included comparison groups of exceptional students which were demonstrated to be free of achievement difficulties.

Under the rather demanding conditions of the present study, which attempted to systematically address each of these weaknesses, the LD were also shown to be significantly poorer in their social perception skill than SLs or the BD, despite the fact that the LD were no less attentive

than either of these clinical comparison groups during the task. Accordingly, while the present results are consistent with a respectable body of research in showing that social perception deficits may be quite characteristic of the LD, they stand in contrast to a number of these studies in suggesting that social perception deficits may be unrelated to IQ--or at least IQs in the 80 to 109 range.

An interesting collateral finding was that the LD, BD and SLs obtained comparable numbers of skill-domain deficits on the SBA. This suggests that the social perception deficits of the LD may be unrelated to their ability to acquire the myriad of other social skills expected of children in the age range studied. This, in turn, raises some question regarding the manner in which a social perception deficit would exert its impact upon the interpersonal relationships of the LD. One possibility is that a social perception deficit would render the LD child less responsive to social cues which call for, or demand, well controlled social behaviour. Consequently, the 'other' would view the LD child as being poorly self-controlled. This is consistent with the present results in that the LD were rated as being primarily self-control deficient.

Finally, and also with reference to intelligence levels, the total number of social deficit ratings obtained by the LD, BD and SLs appear to be more closely related to their IQ than their mean number of behaviour problems. This suggests that the degree of a child's intellectual impairment provides a relatively poor account of his general social skill deficiencies because the number of social deficit ratings obtained by the samples studied appeared to be positively, rather than negatively correlated with IQ. It also hints that behaviour problems and social

deficits may be quite different in nature.

The major areas of overlap between these groups are their skill domain development, as assessed by ratings on the SBA, their tendency to exhibit disproportionately more Over-reacting than Under-reacting behaviour problems on the BSAG, and also in their attentiveness. The similarity of their levels of skill domain development suggests a) that differences in the learning rates of these groups may not be substantial enough to provide for appreciable differences in their ability to acquire the social skills expected of them, or b) that acquiring the social skills expected of boys this age presents a rather low-level intellectual demand. On the other hand, the comparability of their skill domain and attention results provides some reason to suspect that inattention may hamper the skill development of the LD, BD and SLs alike.

The BSAG ratio scores show a) that the LD, BD and SLs are alike in tending to exhibit a predominance of Over-reacting behaviour problems, with this tendency being marked in the BD, and b) that this Over-reacting tendency in the LD is not likely associated with an ability-achievement discrepancy because their results did not differ from those of the SL group. However, these results are highly suspect because neither of the five clinical groups differed significantly on their BSAG Under-reacting scores. As a result, only differences in Over-reacting tendencies are likely to be observed. Thus, there is some reason to believe that the instrument was insensitive to Under-reacting behaviour problems. A plausible explanation for this outcome on the Under-reacting scale is that teachers may tend to differentially notice Over-reacting behaviour problems in males, and Under-reacting behaviour problems in females.



Since the samples studied excluded females, few Under-reacting behaviour problems would be reported.

Finally, with regard to attention, the LD have often been characterized as being inattentive (e.g., Pearl, et al., 1983). However, the LD were no less attentive on the pretest than the BD or SLs. This outcome challenges the appropriateness of this characterization and suggests that inattentiveness is probably better regarded as a feature which is present in a number of exceptional student groups, including the BD and SLs.

To summarize, the social behaviour of the BD, LD and SL samples studied differs both quantitatively and qualitatively. With regard to the former, these groups differ in the number of social deficits they display in general, and in the number of performance and self-control deficits they exhibit in particular. With regard to the latter, the LD display a preponderance of self-control deficits, the BD display an equal mix of performance and self-control deficits, and SLs show even proportions of deficits across the three social domains. However, these groups are similar in their attentiveness, and their tendency to show predominantly Over-reacting behaviour problems as assessed by the BSAG. They also exhibit comparable numbers of skill-domain deficits. Their degree of generalized intellectual impairment provides a relatively poor account of their rated social deficits since the deficit ratings of the groups studied appear to be positively, rather than negatively correlated with IQ. Differences in their obtained social deficit profiles suggest two different accounts for their problematic social behaviour. The first employs three factors: a general social immaturity factor, an inhibitory factor which

suppresses socially desired behaviour, and an activating factor which enhances the use of socially undesired behaviours. The second is a two-factor account which differs from the first in dispensing with the inhibitory factor and in stressing that as self-control impairment increases, the opportunity for the performance of socially desired behaviours declines.

### Tests of the Heterogeneous Assumption

A total of six different hypotheses were developed to examine the extent to which the cognitive profiles of the three LD subtypes were associated with differences in the nature of their social deficits. By and large, the results of the tests of these hypotheses provided only limited support for subtype-specific problematic social behaviour.

In brief, on the BSAG the three subtypes obtained equivalent total and ratio behaviour-problem scores. On the SBA and SCRS, subtype I obtained the highest number of social deficits followed by subtypes III and II, in order. In addition, subtypes I and III both obtained an increasing profile of deficits across the three social domains while the deficit profile of subtype II reached a plateau at the performance domain. With the exception of a very modest tendency in subtype I to obtain more self-control deficits on Nonverbal items, each of the subtypes obtained comparable deficit ratings on the Verbal and Nonverbal items drawn from the SBA and SCRS. Finally, on the pretest, subtype III was significantly less attentive than the other subtypes, while subtype I was significantly less accurate.

First, with regard to behaviour problems, the BSAG data showed that the three subtypes are similar in the number and general nature of the behaviour problems they exhibit. However, these results, as discussed earlier, are suspect.

The social deficit profiles of subtypes I and III coincide with the LD profile described earlier. The deficit profile of subtype II differs from the LD profile in showing significantly fewer self-control-domain deficits. As such, it closely approximates that of the BD, with its essential differences being lower performance- and self-control domain deficit ratings. Verbal-nonverbal cognitive differences between the subtypes did not appear to contribute to the differences they obtained in their rated social deficits. The single exception appeared as a tendency in subtype I to obtain unfavourable self-control ratings on Nonverbal items. Taken together, these results reveal that the social deficits of the LD subtypes are more similar than different, and that the differences between the subtypes are largely in terms of their capacity for self-control.

Given that the total deficit ratings showed that the BD were the least socially skilled of the three major clinical divisions, and that subtype II is the most socially skilled of the LD, it would appear that the elevation of the social deficit profile, and particularly the elevation of the self-control and performance domains, is more closely related to the number of behaviour problems a child displays than is the shape of the child's social deficit profile.

The subtype II profile is of particular interest with regard to the two- and three-factor notions presented earlier. This is because the subtype II performance-domain deficits are as elevated as their self-

control domain deficits while their self-control deficits are significantly below those of subtypes I and III. This reveals that the obtained performance deficit ratings are not a direct consequence of very high self-control deficit ratings. This outcome is consistent with the three-factor notion.

The pretraining results showed that subtype III is significantly more impaired in attention than subtypes I or II. This outcome is consistent with the DSM III and also the work of Lufi and Cohen (1985). Nevertheless, subtype I was significantly less accurate than the other subtypes on the task. The latter may provide an explanation for the widespread finding of social perception deficits in the LD if subtype I, and its variants, represent the largest single group in the LD population as is suggested by the LD classification literature. In addition, the pretest results also suggest that the task of learning is appreciably different for subtype I and III children.

Taken together, these results suggest that the three LD subtypes comprise essentially two social-behaviour groups which differ largely as a function of their capacity for self-control. Subtype II represents the better controlled group, and subtypes I and III comprise the poorly self-controlled group. Nevertheless, the better self-controlled group still exhibits respectable proportions of self-control deficits. Finally, there is some possibility that there may also be differences within each of these divisions, or at least the poorly controlled one, regarding the membership's capabilities to meet demands for socially competent verbal and nonverbal behaviour.

Given that self-control impairment is the primary factor underlying

the differences in their observed problematic social behaviour, these social-behaviour groups should have appreciably different training needs. In this regard, it seems clear that the poorly self-controlled group would require interventions designed to enhance their degree of self-control. Whether the same is completely true of the better-controlled group remains as a question awaiting study. However, it does appear that subtype II will require an equal emphasis on the performance and self-control domains, whereas the poorly controlled group seem much more likely to require interventions which reflect the degree of imbalance in their self-control and performance domain deficits. Nevertheless, both groups are alike in requiring some intervention to enhance the use of the skills which they do have at their disposal; and also in the fact that their skill domain deficits are of relatively little concern when viewed against the difficulties that the performance and self-control domains present for them.

#### Tests of the Validity of Subtypes I and II For Training

Two hypotheses were developed to see if subtype I and II would respond differentially to social perception training which was directed towards their identified verbal and nonverbal cognitive deficits. The results of the tests of these hypotheses differentiated significantly between these subtypes. However, the pattern of results obtained failed to support the notion that as a result of their verbal and nonverbal cognitive differences, the two subtypes would respond differentially to verbal and nonverbal training. Instead, subtype I showed significant, and comparable gains under both forms of training while subtype II improved

significantly under verbal, but not nonverbal training. In contrast, nonverbal training was superior to the control condition for subtype III, but verbal training was not. Post hoc comparisons showed that the post training accuracy scores of subtypes I and III were equivalent under verbal and nonverbal training, while verbal training was significantly more effective than nonverbal training for subtype II. Additional post hoc tests revealed that only the BD, subtype I and subtype III reaped generalized benefits from the training as reflected by their improved attentiveness, whereas SLs, normals and subtype II did not.

These results failed to provide clear support for the notion that social perception training for subtypes I and II should focus directly upon their identified verbal and nonverbal deficits respectively, because the effectiveness of training did not systematically vary with the child's identified cognitive deficits. However, since the training appeared to discriminate between subject groups which are characterized by an impulsive orientation (i.e., subtype I, subtype II, BD) and those who are not (i.e., subtype II, SLs, normals), with only the former showing improved attention as a result of training, it seems conceivable that portions of both training programs, such as those which repeatedly encouraged subjects to 'reflect and test themselves on what they could remember', may have inadvertently been providing a form of self-control training. Moreover, since subtypes I and III did not differ in the accuracy levels they achieved under either form of training, whereas subtype II only improved under verbal training, it is also conceivable that subtypes I and III were responding to this general co-incidental effect while subtype II was not.

Thus, the obtained training results may also indicate that these three subtypes comprise two groups who respond differentially to social skill training. Again, the groups appear to comprise subtype II children on the one hand, and subtype I combined with subtype III, on the other. Although far from conclusive, the results also suggest that differences between these groups in their capacity for self-control may be a much more important general training consideration than the verbal and nonverbal cognitive differences between them. However, there is reason to believe that the better self-controlled group may be selectively responsive to training methods which are oriented towards the verbal domain, and/or methods which capitalize upon their verbal cognitive strengths, since subtype II benefited selectively from the verbal training provided.

With regard to the three explanations which were advanced to account for the problematic social behaviour of the LD, the present results offer very little direct support for the Verbal Deficit explanation since no significant differences were found between the deficit ratings of the subtypes on the social behaviour inventory items making explicit demands for competent verbal social behaviour. Nevertheless, subtype I did exhibit some subtype-specificity in its social behaviour. This suggests that the Verbal cognitive deficits of such children may exert an indirect, rather than a direct effect upon their social behaviour. The very high self-control deficit ratings of subtype I suggests that this may be achieved by distorting the child's cognitive orientation to one of marked impulsivity.

The results obtained on the pretest social perception task were very

consistent with the 'social perception deficit hypothesis'. However, the social deficit ratings obtained by the LD subtypes failed to provide the support expected for the Nonverbal Deficit explanation since the three subtypes, by and large, were rated similarly on items making explicit demands for socially competent nonverbal behaviour. Accordingly, the social deficit rating results seem much consistent with the notion that nonverbal cognitive deficits also act indirectly in producing their impact upon the subtype II child's behaviour by decreasing his self-control impairment.

Several trends in the present results seem quite consistent with the Intrusiveness explanation. First, the deficit ratings for subtype III conformed closely to those expected under this explanation. In particular, these children were much more poorly self-controlled than performance deficient, and they were comparably impaired in their Verbal and Nonverbal social behaviour. In addition, subtype III proved to be significantly less attentive than the other subtypes on the pretest social perception task. Furthermore, the social deficit ratings of subtypes I and II also seemed relatively consistent with the Intrusiveness explanation.

The present results may also provide an elaboration of the Intrusiveness explanation. In particular, the BD and subtype I were both expected to be impulsive, whereas SLs and subtype II were not. All four of these groups were shown to be equally inattentive on the pretest social perception task. Nevertheless, subtype I and the BD obtained much less favourable social deficit ratings in general, and also less favourable self-control deficit ratings in particular than SLs or subtype II. This suggests that impulsivity may be a more debilitating social encumbrance than



inattentiveness.

In summary, the present results provide a fair measure of support for the Intrusiveness explanation and also indicate that this explanation should incorporate a distinction between impulsivity and inattentiveness, with impulsivity being the greater social encumbrance. The social perception results are consistent with the 'perceptual deficit hypothesis', but the social deficit rating results suggest that the Nonverbal Deficit explanation is in need of some revision. Finally, the present results indicate that the Verbal Deficit explanation will require a major revision. In general, it would appear that the revisions required of the Verbal and Nonverbal Deficit explanations should provide a means whereby a child's measured verbal and nonverbal cognitive deficits exert an indirect, rather than a direct influence upon his social behaviour through altering the child's level of impulsivity.

The major contributions of the present study are in linking several parallel bodies of research and clinical literature, and in demonstrating that the cognitive deficits of the LD may be important considerations in the social behaviour and social skill training of these children. A number of the study's results are important additions to the base of knowledge in the social skill literature. They are as follow. First, the LD and SLs are alike in the number of behaviour problems they display, and also possibly in their tendency to exhibit a preponderance of Over-reacting behaviour problems. Second, the LD, BD, and SLs are all comparably skill-domain deficient, but display characteristic social deficit profiles. Third, SLs perform as accurately as normals on a contrived social perception task. Fourth, SLs and normally achieving BD children are as inattentive as the

LD. Fifth, the three LD subtypes appear to display comparable numbers of behaviour problems, and may also display similar Over-reacting:Under-reacting behaviour problem ratios. Sixth, subtypes I and III exhibit very similar, and increasing profiles of social deficits across the skill, performance and self-control domains, while the social deficit profile of subtype II differs in reaching a plateau at the performance domain. Finally, the poorly self-controlled LD subtypes (i.e., subtypes I and III) may respond quite differently to social perception training than subtype II.

The present results also provide support for a large number of earlier research studies. First, the LD classification research literature was abundantly supported. In particular, primary learning disability conditions were obtained in children displaying WISC-R profiles which are repeatedly implicated in learning disabilities by the LD classification research. Moreover, the subtypes defined by these profiles were reasonably well characterized by their achievement results, and each of the subtypes displayed some subtype-specificity in their behaviour. Second, the claim of McKinney and his associates (e.g., McKinney & Forman, 1982) that inattentiveness is a characteristic of several forms of childhood exceptionality, also found clear support. Finally, the present results also provided support for a large number of studies which have shown that social perception deficits are very prevalent in the LD, and offered that this may be a reflection of the proportion of verbally impaired children in the LD population. At the same time, however, the present results are at odds with several studies which have examined social perception deficits in the LD, in finding that deficits of this nature were unrelated to IQ.

### Limitations of the Study

Sample. Three general factors served to restrict the sample studied. The first was the need for a high degree of resolution within and between the subject groups employed. Consequently, the subjects participating were of a very narrow range in IQ, who also exhibited specific WISC-R profiles and specific patterns of achievement. The second factor was the need to control for sources which are likely to introduce heterogeneity in the results obtained which may be unrelated to learning problems. Accordingly, the sample was further restricted for sex and age. The third factor serving to restrict the samples under study was the referral process. In this regard, it is not known if the referred children were active in the caseloads of the referring professionals, particularly memorable cases, or drawn at random from clinical records. Also as a result of the referral process, subjects were not drawn proportionately from the various sources; nor were they proportionately rejected as suitable referrals. Here, however, it should be emphasized that with the exception of one BD student, none of the referred children who were rejected met the criteria adopted by the study. They were therefore simply not of interest. Finally, the appropriateness of the normal comparison group, which was employed primarily to index the difficulty of the social perception task designed for the study is in question. Clearly, these restrictions, combined with the small sample sizes, severely limits the generalizability of the obtained results.

Instruments. The fact that the derived nonverbal scale drawn from the SBA did not correlate well with its instrument of origin in assessing

skill domain deficits is of some concern since it is not known if the failure of differences to appear between groups on the skill domain, and the variability of the SL results on the skill domain, are both products of the instrument's problematic validity.

The Under-reacting scale of the BSAG is also of some concern in that it was unable to detect differences between any of the five clinical groups. If this represents an insensitivity of the scale, then the Over-reacting:Under-reacting scores employed are little more than reflections of the composite score used.

An important limitation of the achievement measures used, which is particularly true of the Reading and Written Language clusters of the Woodcock-Johnson, is that the demands these tests make of the examinee depart considerably from the demands of the classroom. For example, although the Woodcock-Johnson provides a precise Written Language achievement score, the examinee is not required to write a single sentence. Accordingly, it is conceivable that the achievement results of the children assessed may provide a relatively poor reflection of their academic ability in the classroom.

The use of the WISC-R to subtype LD children also presents a number of limitations. In the case of subtype I, for example, it is unknown if, in addition to global language impairment, some of these children also exhibited the more circumscribed language-based difficulties which characterize one of the LD subtypes frequently identified by empirical classification methods. Consequently, some of the variability of the subtype I results may be attributable to the inclusion of 'mixed global and specific' language impairment children.

Another limitation associated with the use of the WISC-R is the apparent complexity of Factor III. To elaborate, in the context of the present study, a depressed Factor III score appeared to identify children exhibiting some impairment of attentiveness as well as impulsivity. However, it is conceivable that children obtaining a depressed Factor III score may comprise a number of highly distinct groups (i.e., distractible, impulsive, inattentive, sequencing deficient, etc.), or several relatively larger groups which share two or more of these areas of difficulty in common. Given that the present results suggest that impulsivity may be a more debilitating social encumbrance than inattentiveness, the homogeneity of subtype III is likely to be of considerable concern from a social skill training point of view.

Finally, it is of concern that so little technical and normative data are available on the SCRC given that self-control proved to be such a pivotal measure for the present study. However, the fact that the results obtained on the scale were, in general, consistent with the prediction, does speak favourably on its behalf.

The Social Perception Task. A major difficulty in constructing the social perception task which served as the basis for the pretest and post test, was in identifying a number of both verbal and nonverbal cues which were uniquely associated with each affective state. Consequently, the number of items used was small, and those employed tended to be somewhat exaggerated. Moreover, pretraining ceiling effects were obtained in one LD student and an average of 25% of the comparison subjects. However, floor effects were not obtained. Thus, it appears that

the task may not have been difficult enough for the comparison groups. An additional limitation of this task is that the forced-choice response format which was adopted may have served to conceal real differences between the groups in the subtlety of their errors. Another is the fact that subjects were summoned to attention prior to each test item. This may have eliminated additional attention-related differences between the groups. A final, and major limitation associated with the use of this contrived task is that a child's pretraining and post training performance levels may be unrelated to his observable social behaviour.

Additional Measures. Several additional measures which would have contributed importantly to the results obtained were omitted largely due to pragmatic considerations. These include vision and hearing testing, the use of a sociometric measure, observational data and also post training generalization and follow-up data. A vigilance task would also have been of value to corroborate the p hit\hit attention scores.

Training. A major criticism to be made of the training provided is that it imposed considerable language demands upon children under all training conditions. Consequently, there is some basis for questioning the distinction between the verbal and nonverbal training employed.

From the foregoing, it is clear that the present study is subject to many restrictions which certainly limit the generalizability, if not the validity of the results obtained. Accordingly, the present findings would likely be best considered as only being suggestive, particularly with regard to the LD population in general.

### Suggestions for Future Research

It would appear that there are at least four general areas calling for subsequent research. The first, and most pressing of these, is a need to assess the extent to which the present results apply to the LD population at large. In this regard, females, older students, those of different IQ ranges, and those exhibiting different WISC-R profiles would all be of considerable interest.

The second is the need to probe further into differences between these two social-behaviour groups. A central question in this regard is the origin of the self-control deficits in the better controlled social-behaviour group. Another is the origin of the performance domain deficits in the poorly controlled social-behaviour group. A third is whether or not sociometric and observational methods will also differentiate between these social-behaviour clusters.

A third general area calling for future study is the need to explore the extent to which less rigidly defined social-behaviour groups exhibit differential effects to training. Of particular interest would be research which contrasts the response of these groups to interventions which are targetted upon the performance, as well as the self-control domain.

Finally, controlled social skill training studies with these social-behaviour groups which assess the durability and generalizability of training effects is the fourth area awaiting research.

### Implications for Social Skill Training

The major implications for social skill training to follow from the present study are:

- 1) that the LD may not be well served by programs tailored for the BD or SLs;
- 2) that group social skill training methods may be quite useful for at least two different social-behaviour groups (i.e., subtypes I and III vs. subtype II) which comprise a respectable segment of the LD population; and
- 3) these social-behaviour groups are likely to require different forms of social skill training.

With regard to the first, since the profile of social deficits of SLs seems quite consistent with their flat, but modestly depressed profile of cognitive abilities, reducing the demands for social competence made of these children to a level commensurate with the child's cognitive maturity seems quite appropriate. However, should skill training be offered, it could be justifiably focused upon either of the three domains.

Since the LD and the BD both exhibited deficits on fewer than three percent of the items used to assess the skill domain, but showed deficits on roughly one third and one half of the items used to assess the performance and self-control domains respectively, training which focuses first on the skill domain deficits of these children is poorly justified. Rather, given that the BD profile of deficits reaches a plateau at the performance domain, these children are likely to require social skill training programs which include two components--one to enhance their use of skills which are at their disposal, and another to counter their



excesses of socially aversive behaviour. On the other hand, since the LD have an increasing profile of deficits, they are likely to require a two-stage training program which focuses first and foremost upon their self-control deficits, and secondly upon their performance deficits; or a program which places greater emphasis upon their self-control problems. However, social perception training may represent a primary training need of the LD.

Importantly, given that the self-control deficiencies of the LD could conceivably reflect their profile of cognitive deficits, whereas problems of self-control cannot easily be attributed to the measured cognitive deficiencies of the normally achieving BD students studied, the training required to enhance the self-control of children belonging to these groups may also need to be different in nature. In the case of the LD, cognitively oriented self-control training could be essential and, from the present results, may also be quite useful. In the case of the BD, it would seem that differential reinforcement of 'well controlled' behaviour would be a useful environmental manipulation for reducing their unrestrained behaviours; while psychotherapy could be necessary to address affective factors serving to disinhibit such a child's social behaviour. At the same time, though, the present results also suggest that this may represent an oversimplification of a rather complex problem given that both the BD and subtype III may have showed general training effects in terms of improved attention.

With regard to determining which of these two social-behaviour groups a particular LD student is likely to belong, two methods are available. The first is to assign the child on the basis of a significantly

depressed Verbal IQ or Factor III score to the poorly controlled group; and those with a significantly depressed Performance IQ to the better controlled group. The second is to assign children who obtain a significantly higher proportion of self-control than performance deficits to the poorly self-controlled group; and those who do not, to the better controlled group. However, it must be kept in mind that the rating scale approach may only be appropriate for children exhibiting one of the above statistically significant WISC-R profiles.

Finally, although differences between the subtypes in terms of their self-control could be of interest from the point of view of grouping LD students for training, the verbal-nonverbal dimension may also be of considerable concern with regard to training. This is because subtype II responded selectively to verbal training, with the differences they obtained under the two training conditions being of a magnitude which is likely to be clinically significant. Whether this outcome is a function of the verbal training capitalizing upon their cognitive strengths, or simply a reflection of the degree of difficulty their nonverbal impairment presents when seen in isolation, is unclear. Nevertheless, it does appear that when pertinent verbal information is available, these children are able to respond well. Accordingly, social skill training for these children should likely be highly verbally flavoured.

With regard to training for the poorly self-controlled group, the suggestion from the present study is that training which: a) encourages these children to reflect on what they have learned, b) then encourages them to test themselves on what they have learned, and then c) provides them with a knowledge of their successes and failures, may represent a

useful approach to self-control training with these students. However, it must be kept in mind that this approach is highly speculative and stems from a post hoc appraisal of the present results.

Additional implications for the social skill training of the LD are:

- a) that self-control training is likely to be a much greater need than interventions which focus upon the performance domain;
- b) interventions which focus upon the performance domain are, in general, likely to bring about more dramatic change in the social behaviour of the LD than those which focus exclusively upon the skill domain;
- c) subtype II children are likely to be lower priority candidates for social skill training than subtypes I and III children;
- d) nonverbally oriented social skill training methods may be counterindicated in the case of subtype II LD children; and
- e) social perception training may be of considerable use for the LD in general, and subtype I children in particular.

#### Implications for Education

The present results hold a number of implications for education. The first of these is that some forms of social skill training may have a favourable impact on the academic progress of some, if not a good number of LD children as a result of the training's effect on their attentiveness. The second is that subtype II students may have a better academic prognosis than subtypes I and III since they were rejected as suitable subjects significantly more often than the other subtypes due to their high achievement; and those participating in the study were

characterized by their relatively good achievement in mathematics. A third is that verbal and nonverbal programs and materials may differ in their value when used with children belonging to the various subtypes. Of particular concern is the possibility that nonverbal materials could be of little or no value when used with subtype II children. Fourth, frequently encouraging the LD to reflect on what they have learned, and then to test themselves to see how much they did remember, followed by the provision of the knowledge of results, may be a very useful instructional strategy with many LD children, and particularly subtypes I and III. Finally, students who remain socially unsuccessful despite tending strongly to use the skills that they have at their disposal, may be slow learners. This is all the more likely to be true if the child also appears to be reasonably well self-controlled.

### Summary

The goals of the present study were:

- 1) to see if the LD are similar to, or importantly different from, the BD and SLs in their problematic social behaviour;
- 2) to see if cognitively different subgroups which have been shown to exist within the LD population do display similar or different patterns of maladaptive social behaviour; and
- 3) to see if these subgroups would respond to different forms of social skill training.

Although the results obtained were far from conclusive and, at best should only be considered suggestive, they indicated that the problematic social behaviour of the LD, as represented by subtypes I, II and III, does

differ from that of the BD and SL both qualitatively, reflecting the shapes of their respective profiles of social deficits; and also quantitatively, in terms of their total number of social deficits. Second, they indicated that there appears to be at least two different subgroups of children in the LD population who are importantly different in the problematic social behaviour they display. One group appears to be much better self-controlled than the other. The former is represented by subtype II LD students, and the latter, by subtype I, and possibly also subtype III children. Additionally, there may also be some important differences within children belonging to each of these social-behaviour groups in their verbal and nonverbal social deficits. Finally, the obtained results suggested that these two groups may have different social skill training needs, and that they are likely to respond differently to social perception training. With regard to the former, the obtained results hinted that enhanced self-control may be an important training need for the poorly self-controlled, but not for the well-controlled group. With regard to the latter, the poorly self-controlled group may be quite responsive to a variety of forms of social skill training programs, at least in terms of improved social perception; while the better self-controlled group may only be responsive to forms of training which are highly verbal in nature.

On the basis of the results obtained it was concluded:

- a) that the LD do differ importantly from SLs and the BD in their problematic social behaviour;
- b) that at least two social-behaviour groups may exist within the LD population whose rated social deficits could be related to differences between the groups in their capacity for self-control;

and

- c) that these social-behaviour groups may have different social skill training needs and respond differently to social skill training.

The major implications to follow from these results are:

- 1) that the LD are not likely to be well served by social skill training programs which have been developed for the BD or SLs;
- 2) that some LD students can be justifiably grouped for the purpose of social skill training, and that social skill training for the LD can therefore be made much less expensive, and much more available; and
- 3) that self-control training might be quite appropriate for the poorly controlled social-behaviour LD group, while training methods oriented towards the verbal domain may be of more use with the better self-controlled social-behaviour LD group.

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**APPENDICES**

**APPENDIX A**  
**Materials Sent to Parents**



## INFORMATION ON THE SOCIAL SKILLS STUDY

Dear parent(s) or guardian(s):

I am writing to describe a study I am conducting as a Ph.D. student of the University of Calgary in the hope that you will consent to your son's participating in the study. Below, I have outlined the study in some detail so that you will have a clear idea of the purpose of the study, the activities involved, and the reasons why I would like your child to participate.

In this study, I will be examining and comparing the social behaviour, social skills and skill training of three groups of elementary school children. The groups I have selected are composed of:

- a) children who learn considerably slower than their age peers;
- b) children who should be achieving well but who are, nevertheless, encountering appreciable achievement problems;
- c) children who are achieving well but encountering appreciable social problems (e.g., difficulty getting along with others, very shy, etc.).

My hope is to learn a good deal more than is presently known about the social difficulties of children in the second group in order to develop effective methods to deal with problems of this nature when they arise.

All children participating in the study will go through very similar individually administered tasks. These include:

- a) Three relatively short achievement tests.
- b) Viewing a video tape and trying to guess how the actress shown is feeling at different times.
- c) Watching i) a skill training tape that teaches some of the important things to watch or listen for when trying to figure out how another person is feeling, or ii) watching a prepared educational ("Science International") film.
- d) A very short test to make sure that the child did learn the important points of the skill training tape or educational film.
- e) Viewing another tape, similar to the one used in point b) above, to see if the child's new knowledge helps him to be more accurate in judging how the actress is feeling.

Brief rest periods will be provided between each of the activities and a short intermission will be held midway through the session. All activities will be scheduled so they won't interfere with your child's recess, lunch hour, or any special school activities. In no circumstances will your child be required to remain after school hours to complete the study's activities and no activities other than those listed above will be provided. With all this, completing all of the activities listed should not

take much more than two hours of your child's time, so a single session should be all that is needed with him.

Your child's homeroom teacher will also be asked to complete a number of checklists for the study. On the first one, he/she will simply underline phrases that describe your child's usual behaviour in the classroom and on the playground. On the others, he/she will note whether your child does certain things (e.g., volunteers answers) more or less often than other students in the class.

If you do NOT want your child to participate, simply complete and return the bottom portion of one of the "Parental Consent and Release of Information" forms. If you approve of your child's participating, please ask him if he would like to have some extra activities in school one day which include watching the films and tapes I have described and the other activities listed above. If he is interested, please complete and sign the upper portion of both of the attached "Parental Consent and Release of Information" forms and return them to the school.

In addition to showing that you approve of your child's participating in the study, your signature of these forms also gives your son's teacher the approval necessary before he/she can complete the checklists I will be sending out to the school. It also allows the school to provide me with a number of ability test scores that I will need which are usually kept in the child's file.

Please be assured that all information that I gather during the course of the study, and any information given to me by the school will be kept strictly confidential. Furthermore, as soon as the study is completed, all of my records which are identified by the names of the children participating will be destroyed.

Please feel free to telephone me at the Division Office if you have any questions or concerns.

Thank you for your time and interest.

Yours truly,

B. Nodrick  
Ph.D. Candidate  
Department of Educational  
Psychology  
University of Calgary

# PARENTAL CONSENT & RELEASE OF INFORMATION

I/We the parent(s) and/or guardian(s) of \_\_\_\_\_  
 d.o.b. \_\_\_\_\_ who attends Grade \_\_\_\_\_ at  
 \_\_\_\_\_ school in Mr./Mrs./Ms. \_\_\_\_\_'s  
 class consent to his participation in a Ph.D. dissertation study by B.  
 Nodrick which concerns the social behaviour, social skills and social skill  
 training of elementary school children.

It is our understanding that the child's participation in the study is

- i) voluntary on the child's behalf and that he may choose to withdraw at any time;
- ii) will involve no appreciable risks or hazards for him; nor
- iii) expose him to any degree of discomfort.

Furthermore, I/We the undersigned hereby

- a) authorize this child's teacher(s) and school to complete and return all forms pertaining to this study which are forwarded to the school by Mr. B. Nodrick;
- b) consent to the release of standardized test scores kept on record which are requested by B. Nodrick; and
- c) consent to this child's participating in the study during school hours, and in the confines of the school.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 1987.

\_\_\_\_\_  
 Parent/Guardian

\_\_\_\_\_  
 Witness

\_\_\_\_\_  
 Parent/Guardian

\_\_\_\_\_  
 Witness

-----

I/We do NOT want our son, \_\_\_\_\_ to  
 participate in the social skills study.

\_\_\_\_\_  
 Signed

**APPENDIX B**  
**Materials Sent to Schools**

Mr. \_\_\_\_\_  
Principal \_\_\_\_\_ School  
\_\_\_\_\_  
\_\_\_\_\_

Dear Mr. \_\_\_\_\_:

I am writing to ask for your permission to conduct a portion of my Ph.D. dissertation research in your school. Attached is a summary of the study proposed. As you probably know, it was recently reviewed and approved by the Division. I hope it is sufficiently detailed to answer any questions you may have regarding the study in general.

Also attached is: a) a copy of the U of C Ethics Committee's approval of the study, b) a copy of a covering letter for parents of participating children, c) a copy of the parental consent form used in the study, d) a covering letter for homeroom teachers of participating students, and e) copies of the inventories which participating homeroom teachers will be required to complete for the students involved.

Since all of the work I will be doing with these children is on an individual basis, classes need not to be disrupted. However, a small working space will be required. I have found that the space which is typically reserved for clinicians tends to meet the study's needs quite nicely.

In closing, I would like to say that I hope you review the study favourably, and that I will call back within the next couple of days to see if you have reached a decision.

Yours truly,

Bill Nodrick  
Ph.D. Candidate  
Department of Educational  
Psychology  
University of Calgary

**COVERING LETTER TO TEACHERS REGARDING THE SOCIAL SKILLS STUDY**

Dear Teacher:

The parents of \_\_\_\_\_, a student in your class, have consented to his participation in a Ph.D. dissertation study by B. Nodrick which concerns the social behaviour and social skill training of elementary school children. The study has been reviewed and approved by your principal. A summary of the study and its purposes has been appended in the form of a letter sent out to the child's parents.

I am hoping that you will assist in the study by completing the attached inventories with reference to the child named above. Two of them are rather long and may require from 10 to 15 minutes to complete. The third can be finished easily in a matter of a few minutes. The directions for each inventory are to be found on its front page. All information you provide will be considered strictly confidential and all records identified by student names will be destroyed at the completion of the study.

Your completing and returning the enclosed inventories will be taken to indicate your voluntary participation. If, however, you choose not to participate, simply return all of the materials enclosed uncompleted, and place an "X" in the space at the bottom of this page to indicate that you do not wish to participate.

Please note that a copy of the signed parental consent and release of information has been included for your inspection. A prepared envelope has also been enclosed for the return of all materials forwarded.

Your co-operation and time are very much appreciated.

Yours truly,

B. Nodrick  
Ph.D. Candidate  
Department of Educational  
Psychology  
University of Calgary

I do NOT wish to participate

**APPENDIX C**  
**Pretest Transcript**

**Pretest Transcript**

- Narrator:** Hi there! I hope you're feeling really good today because I've got quite a few fun things for you to do, so let's begin. You know, it's very important to be able to tell how another person is feeling. Let's see how good you are at it. Here's how we'll do it. I'll show you some very short films of a girl. After each one, I'll ask you if you think she's feeling happy, angry, sad, worried or startled. When I do, say your answer out loud. Are you ready? Here's the first film. Pay close attention because it's really very short.
- Actress:** (Looking down with a hint of a frown, speaking slowly and softly)  
Sometimes, I just don't know what to do with you.
- Narrator:** Do you think the girl was feeling happy, angry, sad, worried or startled? Go ahead, say your answer out loud. (Pause) Here's the next one. Pay very close attention because the film is so short.
- Actress:** (Shaking head slowly back and forth, wrinkled brow, normal rate of speech, voice trembling slightly)  
Sometimes, I just don't know what to do with you.
- Narrator:** Do you think the girl was feeling happy, angry, sad, worried or startled? Go ahead, say your answer out loud. (Pause) Here's the next one. Pay very close attention because the film is so short.
- Actress:** (Speech forcefully delivered, mouth pursed and teeth clenched)  
Sometimes, I just don't know what to do with you.
- Narrator:** Do you think the girl was feeling happy, angry, sad, worried or startled? Say your answer out loud. (Pause) Here's the next one. Remember, pay very close attention because the film is really quite short.
- Actress:** (Smiling before and throughout dialogue, speech delivered in a sing-song manner)  
Sometimes, I just don't know what to do with you.
- Narrator:** Do you think the girl was feeling happy, angry, sad, worried or startled? Go ahead, say your answer out loud. (Pause) Here's the next one. Pay very close attention.
- Actress:** (Mouth and eyes open wide suddenly, speech breathy and rapid)
- Narrator:** Do you think the girl was feeling happy, angry, sad, worried or startled? Go ahead, say your answer out loud. (Pause) Very good. That's all for now.



**APPENDIX D**  
**Verbal Training Program and**  
**Mastery Test Transcript**

**Verbal Training Program and Mastery Test Transcript**

**Narrator:** You already know that it's very important to be able to tell how another person is feeling. In this tape, I'm going to tell you some of the important things to listen for so that it will be real easy for you to tell when another person is feeling happy, angry, sad, worried or startled. It's quite easy to do and it's fun too. Let's begin. First, I'll talk about what a happy person sounds like. Let's say a girl gets a really nice present -- something she's always been wanting. What you will notice when she talks is that she might laugh just a little bit when she talks. You might also notice that what she says sounds a little bit like a song. Listen carefully to this happy girl's voice and see if you can hear her laugh just a little bit when she talks; and see if what she says sounds a little bit like a song.

**Actress:** Oh John! It's such a lovely gift. I've always wanted one.  
(voice only)

**Narrator:** There! Did you hear that? The happy girl laughed a little bit while she spoke and what she said sounded like it was part of a song -- a happy song. Let's listen to this happy girl once again.

**Actress:** Oh John! It's such a lovely gift. I've always wanted one.  
(voice only)

**Narrator:** There! So if we hear someone laughing a little bit when they talk or if what they say sounds a little bit like a part of a song, we know that person is probably happy.

An angry person doesn't sound too much like a happy person at all. Let's say that a boy broke a girl's doll on purpose and that the doll was very special to the girl. Even if we didn't see the boy break the special doll, we would know from the way the girl talked to the boy that she was angry because, when she talked, every word would be said quite loud, and it would also sound like the girl was talking with her front teeth held closed together. Listen now as this angry girl talks. Notice that every word is said quite loud and that the girl sounds like she's holding her front teeth closed together.

**Actress:** John, that doll was very special to me and I'm really angry at you for breaking it!  
(voice only)

**Narrator:** Now, let's listen to this angry girl once again. Listen carefully to how each word sounds like the girl is talking through her front teeth and how she says every word quite loud.

Actress:  
(voice only) John, that doll was very special to me and I'm really angry at you for breaking it!

Narrator: There. So a happy person laughs a little while they talk and what they say sounds like it might be part of a song, but an angry person talks through their front teeth and each word they say is just about as loud as every other word they say. I'm sure that you will be able to remember now how to tell when a person is happy or angry.

Let's talk now about when a person is feeling sad. Say that a girl just found out that her very best friend is moving far away to another city for good. We would know when we hear from her talking that she is sad because her voice would be quiet and soft and she would speak very slowly. Now listen to this girl who is sad. Listen to how quiet and soft her voice is and how slowly she speaks.

Actress:  
(voice only) I'm really going to miss you Julie. We used to have so much fun together.

Narrator: Did you hear that? did you hear how this sad girl spoke quietly, softly and very slowly? Now listen once again to how quietly, softly and slowly a sad person speaks.

Actress:  
(voice only) I'm really going to miss you Julie. We used to have so much fun together.

Narrator: So a happy person laughs a little while they talk and what they say sounds like it could be part of a song. An angry person talks through their front teeth and they say every word quite loud. A sad person speaks slowly, quietly and softly.

Now, I'm going to talk about how a worried person sounds. When you listen to a worried person talking, you'll notice that they talk at the same speed that they usually do -- not too fast and not too slow -- but their voice sounds a little bit shaky, or trembly. I want you to listen now to the voice of a girl who got a very bad report card. She thinks that her parents might be quite angry about it. Listen to how her voice trembles or shakes a little bit and notice that she doesn't speak very slow or very fast, but just at a normal speed.

Actress:  
(voice only) I wonder if mom and dad will make me stay in until my marks improve.

- Narrator: Did you hear her voice shaking or trembling a little bit, and did you notice she didn't speak real slow or real fast, but just at a normal speed? Listen again. Listen to see if this worried girl's voice shakes or trembles a little bit and also listen to see if she speaks at a normal speed, not too fast and not too slow.
- Actress:  
(voice only) I wonder if mom and dad will make me stay in until my marks improve.
- Narrator: So now we know a happy person laughs a little bit when they talk and what they say sounds like it could be part of a song. An angry person speaks through their front teeth and says each word just as loud as the rest. A sad person speaks very slowly and their voice is soft and quiet. A worried person speaks at a normal speed, but their voice sounds shaky or trembly.
- Now, I'm going to tell you what you need to know to tell if a person has been startled. Let's say that a girl has been working away quietly at her desk and her friend sneaks up behind her and yells "Boo!" really loud. Just by hearing this girl talk, we would know that she has been startled because she would speak very quickly and she would let out a lot of air as she spoke. Listen now to the voice of a startled girl. Notice that she speaks very quickly and that when she talks it sounds like a loud fast whisper.
- Actress:  
(voice only) Oh my goodness! You scared the life out of me.
- Narrator: Did you notice how quickly she spoke? Did it sound like a loud, fast whisper to you? Listen for these things again.
- Actress:  
(voice only) Oh my goodness! You scared the life out of me.
- Narrator: There. I'm sure you heard it that time. This startled girl spoke very fast and it sounded like a loud, fast whisper.
- Now then, here are the things we have learned. A happy person laughs a little bit when they talk and what they say sounds like it could be part of a song. An angry person talks through their teeth and says each word just about as loud as every other word. A sad person speaks very slowly and their voice is quiet and soft. A worried person speaks at a normal speed, but their voice is a little bit trembly or shaky. A startled person speaks very quickly and what they say sounds like a loud, fast whisper.

Can you remember all that? Thank about it for a minute. How can you tell if a person sounds happy? (Pause) How can you tell if they sound angry? (Pause) How can you tell if they sound sad? (Pause) What about when someone is worried? How do they sound? (Pause) How can you tell if a person has been startled? (Pause)

Do you remember what a happy person sounds like? (Pause) What about an angry person? (Pause) Did you remember that one? Could you remember what a sad person sounds like? (Pause) Did you remember how they sound? (Pause) What about a startled person? (Pause) Could you remember how they sound?

Let's see how many you did remember. If you remembered that a happy person laughs a little while they talk and what they say sounds like it could be part of a song, you were right. If you remembered that an angry person speaks through their front teeth and says every word quite loud, you were right again. If you remembered that a sad person speaks very slowly and their voice sounds quite soft, you were also right. If you remembered that a worried person speaks at a normal speed, but their voice sounds shaky or trembly, you were right once more. Finally, if you remembered that a startled person speaks very fast and what they say sounds like a loud whisper, you were right again.

Now, I want you to say out loud how a happy person sounds. Go ahead, say it out loud. (Pause) Now say out loud how an angry person sounds. Go ahead, say it out loud. (Pause) Now tell me, out loud, how a sad person sounds. (Pause) Now, I want you to say out loud how a worried person sounds. Go ahead, say it out loud. (Pause) And finally, I want you to tell me how a startled person sounds. Go ahead, say it right out loud. (Pause). Very good.

**APPENDIX E**  
**Nonverbal Training Program and**  
**Mastery Test Transcript**

**Nonverbal Training Program and  
Mastery Test Transcript**

**Narrator:** You already know that it's very important to be able to tell how another person is feeling. In this tape I'm going to show you some important things to watch for so that you'll be able to tell when an other person is feeling happy, angry, sad, worried or startled. It's quite easy to do and it's fun too. Let's begin. First, I'll show you how a happy person looks. Let's say a girl gets a really nice present -- something she's always wanted. The most important thing you will notice when you look at her face is that she will be smiling. You should even be able to see the smile of a happy person when they're talking. Watch carefully now and I'll show you a happy girl. I want you to watch her mouth very carefully. See if you can see her smile while she's talking.

**Actress:** (smiling throughout her unheard dialogue)  
(without audio)

**Narrator:** Did you see that? The happy girl was smiling before she started to talk and you could even see a little bit of a smile while she was talking. Let's watch this happy girl once again. Watch for these things.

**Actress:** (smiling throughout her unheard dialogue)  
(without audio)

**Narrator:** There, so if we see someone smiling or even a little bit of a smile while they're talking, we know that the person is probably happy. Now let's talk about how an angry person looks.

An angry person doesn't look anything like a happy person. Let's say that a boy broke a girl's doll on purpose and that the doll was very special to the girl. Even if we didn't see the boy break the special doll, we would know from the way the girl looked that she was angry because she would make her mouth small and she would keep her front teeth closed together when she was talking. Let's watch how the girl looks when she's angry. Notice that she makes her mouth small and she doesn't open up her front teeth very much even when she talks.

**Actress:** (mouth pursed, front teeth held together throughout her unheard dialogue)  
(without audio)

Narrator: Now, let's watch this angry girl once again. Watch how small she makes her mouth and notice that she keeps her front teeth closed when she talks.

Actress: (mouth pursed, front teeth held together throughout her  
(without audio) unheard dialogue)

Narrator: There, so a happy person is usually smiling -- even while they talk. An angry person makes their mouth very small and keeps their front teeth together when they talk. I'm sure you'll be able to remember now what to watch for to tell if a person is happy or angry.

Let's talk now about when a person is feeling sad. Say that a girl just found out that her very best friend is moving far away to another city for good. We would know just by looking at this girl that she is sad because she would be frowning a little bit and she would often be looking down as she spoke. Watch this girl who is sad and notice that her mouth is turned down a little bit into a frown; and notice too that she looks down while she is talking to her friend.

Actress: (frowning slightly, eyes cast down while she speaks her  
(without audio) unheard dialogue)

Narrator: Did you see that? Did you see how her mouth was turned down into a little frown and that she looked down while she talked? Now watch once again to see how a sad person frowns a little and how they look down while they talk.

Actress: (frowning slightly, eyes cast down while she speaks her  
(without audio) unheard dialogue)

Narrator: So, a happy person is usually smiling -- even when they talk. An angry person makes their mouth very small and keeps their front teeth together when they talk. A sad person frowns a little bit, and their eyes often look towards the ground when they are talking.

Now, I'm going to talk about how a worried person looks. When you watch a worried person, you'll notice that they usually wrinkle up their forehead -- this area right here. Worried people often also shake their head slowly back and forth while they talk.



I want you to watch now as I show you a girl who got a very bad report card. She thinks her parents will be quite angry about it. Notice the wrinkle above her eyebrows, and watch how she slowly shakes her head back and forth as she talks.

Actress: (forehead wrinkled, shakes head slowly back and forth  
(without audio) throughout her unheard dialogue)

Narrator: Did you see the wrinkles in her forehead? Did you notice that she was shaking her head back and forth slowly as she talked? Watch again. Look for the wrinkles in this worried girl's forehead and watch her shake her head back and forth slowly as she speaks.

Actress: (forehead wrinkled, shakes head slowly back and forth  
(without audio) throughout her unheard dialogue)

Narrator: So, now we know a happy person is usually smiling and that happy people even smile a little while they are talking. An angry person makes their mouth quite small and usually keeps their front teeth together when they talk. Sad people are usually frowning a little and their eyes often look down towards the ground. Worried people wrinkle their forehead and often shake their head back and forth as they talk.

Now, I'm going to show you what you need to know to be able to tell if a person has been startled. Let's say that a girl was working quietly away at her desk and her friend snuck up behind her and shouted "Boo!" really loud. Just by looking at the girl, we would know that she was startled because her eyes would open very wide, and her mouth would also open up as she took in a quick breath of air. Watch this startled girl. Notice that her mouth opens quickly and that her eyes get very wide, right at the same time.

Actress: (eyes and mouth suddenly open wide with a jerking  
(without audio) movement of the head)

Narrator: Did you see that? Her mouth just popped open as she took in a quick breath of air and her eyes opened up very wide right at the same time. Watch closely for these things again.

Actress: (eyes and mouth suddenly open wide with a jerking  
(without audio) movement of the head)

Narrator: There, I'm sure you saw it that time. When startled, the girl's mouth popped open as she took in a quick breath of air and her eyes opened up very wide at the same time.

Now then, here's the things that we've learned. A happy person is usually smiling, and you can still see their smile when they talk. An angry person makes their mouth quite small and usually keep their front teeth together when they talk. A sad person usually has their mouth turned down into a little bit of a frown and their eyes often look down towards the ground. A worried person wrinkles up their forehead and shakes their head back and forth slowly as they talk. A startled person opens their mouth suddenly and their eyes grow very wide at the same time.

Can you remember all that? Just think about it for a minute. How can you tell if a person looks happy? (Pause) How do you know when a person looks angry? (Pause) What about a sad person? How do they look? (Pause) How do you know when a person looks worried? (Pause) How does a startled person look? (Pause)

Did you remember what a happy person looks like? Did you remember what an angry person looks like? What about a sad person? Did you remember how they look? Did you remember how a worried person looks? Did you remember how a startled person looks? Let's see if you were right.

If you remembered that a happy person is usually smiling, and that you can even see their smile as they talk, you were right. If you remembered that an angry person usually makes their mouth quite small and keeps their front teeth held closed together when they talk, you were right again. If you remembered that a sad person usually has a little frown and often looks down when they are talking, you were right once more. If you remembered that a worried person wrinkles up their forehead and often shakes their head back and forth slowly as they talk, you were right. Finally, if you remembered that a startled person usually pops open their mouth as they take a quick breath of air, and that their eyes open up very wide at the same time, you were right again.

Now, I want you to say, out loud, how a happy person looks. Go ahead, tell me right out loud. (Pause) Now say how an angry person looks. Say it right out loud. (Pause) Now, tell me out loud how a sad person looks. (Pause) Now, say out loud how a worried person looks.

(Pause) And now, I want you to say out loud how a startled person looks. (Pause) Very good.

## **APPENDIX F**

### **Post Training Test Transcript**

### Post Training Test Transcript

- Narrator: Now, let's see how you do with those faces you saw before. I'm sure you'll find it even easier than you did before. Again, I'll show you some very short films of a girl and I want you to tell me, right out loud, if you think she's feeling happy, angry, sad, worried or startled. Remember, say your answer out loud. Are you ready? Here's the first one.
- Actress: (Shaking head slowly back and forth, wrinkled brow, normal rate of speech, voice trembling slightly)  
Sometimes, I just don't know what to do with you.
- Narrator: Do you think the girl was feeling happy, angry, sad, worried or startled? Go ahead, say your answer out loud. (Pause) Here's the next one. Pay very close attention because the film is so short.
- Actress: (Looking down with a hint of a frown, speaking slowly and softly)  
Sometimes, I just don't know what to do with you.
- Narrator: Do you think the girl was feeling happy, angry, sad, worried or startled? Go ahead, say your answer out loud. (Pause) Here's the next one. Pay very close attention because the film is so short.
- Actress: (Mouth and eyes open wide suddenly, speech breathy and rapid)  
Sometimes, I just don't know what to do with you.
- Narrator: Do you think the girl was feeling happy, angry, sad, worried or startled? Go ahead, say your answer out loud. (Pause) Here's the next one. Pay close attention.
- Actress: (Smiling before and throughout dialogue, speech delivered in a sing-song manner)  
Sometimes, I just don't know what to do with you.
- Narrator: Do you think the girl was feeling happy, angry, sad, worried or startled? Say your answer out loud. (Pause) Here's the next one. Pay very close attention.
- Actress: (Speech forcefully delivered, mouth pursed and teeth clenched)  
Sometimes, I just don't know what to do with you.
- Narrator: Do you think the girl was feeling happy, angry, sad, worried or startled? Say your answer out loud. Go ahead. (Pause) Very good. That's all for now.