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PERSONALITY DIMENSIONS OF LEARNING DISABLED CHILDREN: AGE AND SUBTYPE DIFFERENCES.

JOHN DOUGLAS. STRANG

University of Windsor

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PERSONALITY DIMENSIONS OF LEARNING DISABLED
CHILDREN: AGE AND SUBTYPE DIFFERENCES

by

C

John Douglas Strang
B.A., York University, 1974
M.A., University of Windsor, 1977

A Dissertation
Submitted to the Faculty of Graduate Studies
through the Department of Psychology
in Partial Fulfillment of the
Requirements for the Degree
of Doctor of Philosophy at the
University of Windsor

Windsor, Ontario, Canada

1981
I dedicate this dissertation to my mother,
Joyce A. Strang, and to my father, C. Frederick Strang.
ABSTRACT

This dissertation includes two separate studies. Study 1 was designed to evaluate the significance of age for the personality adjustment of learning disabled children. Three rather heterogeneous groups of learning disabled children (n = 20) who differed in chronological age, were matched for WISC Full Scale IQ, degree of academic impairment in at least one subject area, educational-cultural milieu, and sex. One group was comprised of 8-year-old learning disabled children. Ten-year-old learning disabled children were contained in a second group. A third group included 12-year-old learning disabled children. The PIC (Personality Inventory for Children) profiles of these three groups of children were compared. All PIC's were completed by the child's mother.

It was expected that older learning disabled children would exhibit more evidence of personality disturbance than would younger learning disabled children. No clear statistical support was found for this expectation.

Post hoc analyses indicated that mothers of the 12-year-olds were less concerned about the intellectual limitations of their children than were mothers of the 8-year-olds. The overall results of this study suggested that there may be a qualitative change in the way in which a mother perceives her learning disabled child as the child grows older.
Study 2 was designed to evaluate the significance of learning disability subtype for personality adjustment. Three groups of learning disabled children (n = 20) who differed in their learning disability subtype were matched for WISC Full Scale IQ, degree of academic impairment in at least one subject area, educational-cultural milieu, and sex. Group 1 included children who exhibited a pattern of approximately equivalent levels of proficiency in their "word-knowledge" and "visual-perceptual-organizational" skills. Group 2 children had well-developed "visual-perceptual-organizational" skills and more poorly developed "word knowledge" skills. Children in Group 3 exhibited a pattern of well-developed "word knowledge" skills and more poorly developed "visual-perceptual-organizational" skills.

Group 3 children were of primary concern in this study because of the suspected relationship between personality maladjustment and specific deficiencies within the visual-perceptual and visual-spatial information processing realms. It was expected that Group 3 children would exhibit PIC profiles that were more suggestive of personality maladjustment than would Group 1 and Group 2 children.

It was found that Group 3 children exhibited more evidence of personality maladjustment (as measured by the PIC) than did children in Group 2. Although no significant differences were obtained between Group 3 and Group 1 children on the PIC, Group 3 children obtained higher mean PIC T score values on nine of the nine PIC scales associated with the psychopathology.

As was predicted, the PIC Psychosis scale exhibited the highest T score elevation of all the (PIC) profile scales associated with
psychopathology for Group 3 children. This scale was also found to be the best clinical scale for differentiating the PIC profiles of Group 2 and Group 3 children. When the degree of discrepancy between levels of performance in "word knowledge" skills and "visual-perceptual-organizational" skills were maximized for Group 3 children through a subject re-selection procedure (n = 7), the mean PIC Psychosis scale T score increased substantially.

These findings are discussed primarily in terms of the interactions between learning disability subtypes and socio-emotional disturbances. The information processing strengths and weaknesses and PIC characteristics which best distinguish Group 3 children are emphasized in this discussion. There is also some commentary presented concerning the clinical and research utility of the PIC with learning disabled children.
ACKNOWLEDGEMENTS

Dr. Byron Bourke has given me the benefit of his concern, guidance, wisdom and his example throughout my graduate training. There are few gifts in my adulthood which I have cherished as much.

I wish to extend my thanks to Dr. Akira Kobasigawa, Dr. Neal Holland, and Dr. Louis Costa for serving on my dissertation committee.

Ms. Maria Lalli, Ms. Marilyn Frederick and Ms. Irene Arseneau have been very helpful and considerate in their efforts to type the various drafts of this dissertation. Thank you.
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CHAPTER I

INTRODUCTION

Recently, there has been a great deal of concern focused on the emotional and social development of learning disabled children. This is reflected, to some extent, in the relative wealth of studies that have addressed this subject in the past ten years.

During roughly this same period, there has also been a large number of research projects concerning the academic and information processing characteristics of learning disabled children. Many of the problems which have plagued these investigations are also reflected in studies of the social and emotional characteristics of learning disabled children.

One conspicuous factor that contributes to this particular state of affairs is the poor consensus regarding the meaning of the term learning disability. Historical transitions in the types of learning impaired children that have been studied and theoretical frames of reference emanating from these investigations have contributed to some of the confusion in the area. The concern and involvement of educational authorities with special educational facilities and programmes for the learning impaired child have added yet another source of potential misunderstandings with respect to the learning disabled
child. Finally, general public awareness of the special education needs of learning impaired children and very recent laws reflecting this public concern (designed to provide necessary treatment for learning impaired children) have done little to discourage the misconceptions in this realm.

In view of this, it is not surprising to find that there have been outstanding limitations inherent in most studies concerning the emotional and social characteristics of learning disabled children. Following a brief outline of common research strategies in the field, the limitations of many studies conducted in this area are discussed in detail. This discussion should provide some background for the approach adopted for the proposed studies.

For the most part, researchers have tended towards studies which have employed rather heterogeneous groups of learning disabled children. Now that subtypes of learning disabled children have been established clearly through the utilization of a number of approaches, there would seem to exist distinct limitations in the interpretability of the results obtained from many investigations in this area. An overview of the "subtype" issue with respect to the learning disabled child is provided to gain a better perspective of the significance of the proposed studies. Following this, there is some rather specific background presented for the two separate studies included in this dissertation. These studies were designed specifically to evaluate two variables which were thought to hold some significance for the social and emotional development of some or all learning disabled children.
Study 1 was designed to investigate the significance of age for the degree of personality disturbance exhibited by learning disabled children. Three groups of learning disabled children who differed only with respect to age are compared in Study 1.

Study 2 was designed to investigate primarily the significance of learning disability subtype for the degree of personality disturbance exhibited by learning disabled children. Three groups of learning disabled children who differed only with respect to learning disability subtype are compared in Study 2.
CHAPTER II
REVIEW OF THE LITERATURE

(Common) Research Strategies in the Field

Many investigators of the social and emotional significance of learning disabilities would contend that research in this area has been rather prolific and quite diversified during the last ten years. Certainly, if one is to peruse the contents of a journal which focuses on learning disabilities in childhood (e.g., Journal of Learning Disabilities; Journal of Special Education) a similar conclusion may be drawn. For example, relatively recent studies in these two journals include the following: Actual and perceived peer status of learning disabled students in mainstream programs (Bruininks, 1978); social relationships and verbal interactions of learning disabled children (Bryan, 1978); teachers' perceptions of educationally high risk children (Keogh, Tchir, & Windguth-Behn, 1974).

The titles of these recent studies appear to describe research projects which differ considerably from each other. Despite these contentions and appearances, there are at least two common features shared by most studies in this area: (1) the studies focus on comparison of children who are experiencing some difficulties with academic achievement and children who are "normal" with respect to
academic achievement; (2) the children are given tasks or measures which are designed to obtain information concerning some aspect of their behavioural or emotional functioning. Although there are some exceptions to this type of research format (e.g., only children with learning difficulties are tested with a particular measure or set of measures), these features are predominant in the research undertaken in this area. As one might expect, the results of these studies also exhibit a great deal of similarity — learning impaired children fare worse than do their normal achieving peers on most measures.

Aside from the above mentioned general limitations with respect to research design, there would appear to be some more specific limitations inherent in most studies with respect to (a) subject selection, (b) preconceptions about the target population, and (c) the range and scope of dependent measures employed. All of these limitations would appear to hold some relevance for the design of the present studies. These limitations can be best illustrated through a critical review of a typical study in this field.

The following is a detailed description of one such "typical" study. This particular study was selected because it (a) is relatively recent; (b) is widely cited (e.g., Bryan, 1979); (c) appears to have been carefully designed; and (d) appeared in a major "learning disability" journal (Journal of Learning Disabilities).

Title: Peer status and personality characteristics of learning disabled and nondisabled students
Author: Virginia L. Bruininks
Date published: 1978
Purpose(s). The purpose(s) of this study were to compare the (1) peer status, (2) self concept, (3) perceived peer status, (4) friendship preferences, and (5) interpersonal needs of learning disabled (LD) and nondisabled students.

Subjects. The original subject pool consisted of 162 elementary school-aged children from seven regular classrooms in two suburban school districts in Minnesota. These districts were chosen because they had mainstream programmes for learning disabled students. From this subject pool, 23 students were identified for inclusion in the experimental (learning disability) group by meeting the state guidelines for professional services as learning disabled students.

The State of Minnesota employs the definition of learning disabilities provided by the USOE, Bureau of Education for the Handicapped, 1961, and Public Law 91-230, dated April 13, 1970. According to Bruininks, this definition qualifies a child for (special educational) services and psychological assessment when the staffing teams discover "(1) learning problems...so dysfunctional as to seriously interfere with the child's own school progress or the educational rights of other children and which requires attention and help beyond that which the regular instructional program can provide; and, (2) sufficient sensory integrity, motor skills, and general mental ability to make educational consideration as a mentally retarded, hearing, vision, or motor impaired child unnecessary" (State Department of Education, 1973, p. 7).

The contrast group for this study consisted of 23 children who were also selected from the original subject pool. Experimental and
contrast group children were matched by sex and classroom. In this
regard, there were 15 boys and 8 girls in each (LD and contrast) group;
learning disabled boys and girls were matched individually by sex
with control boys and girls from the same classrooms.

Measures. Children from the experimental and normative groups
completed the following tests: (1) the addition, subtraction,
multiplication and division subtests of the Key Math Diagnostic
Arithmetic Test (Connolly, Nachtman, & Pritchett, 1971); (2) the word
identification subtest of the Woodcock Reading Mastery Test (Woodcock,
1973); (3) the general information subtest of the Peabody Individual
Achievement Test (Dunn & Markwardt, 1970); (4) the Peer Acceptance
Scale (Bruininks, Rynders, & Gross, 1974); (5) the Coopersmith Self-
Esteem Inventory (Coopersmith, 1959), and (6) the Fundamental
Interpersonal Relations Orientation-Behaviour (FIRO-B). Items from
the latter two measures were read to the children. The Peer
Acceptance Scale includes a pictorial format, although language
concepts were involved.

Results. It was found that the learning disabled student scored
more poorly on academic achievement measures, were less popular,
had poorer self-concepts, and were less accurate in assessing their
own social status than contrast (non-disabled) students. It was also
determined that they chose their friends on the same basis as did
other children and that they evidenced the same interpersonal needs
as contrast students. In addition, the learning disabled students
apparently had a higher need to express control. Analyses of variance
and correlations were employed to generate these results.
Conclusions. The author concludes that "further research is needed to understand the social perceptiveness, need for control, low peer status, low self-esteem, and other characteristics of learning disabled students. The learning disabled population is generally a heterogeneous one. Perhaps future inquiries should focus on the clusters of characteristics found in various subgroups of learning disabled populations so that appropriate interventions can be developed" for these students (Bruininks, 1978, pg. 489).

This study would appear to be fundamentally sound in terms of design and methodology. In many ways, Bruininks has been more careful in designing and implementing this research project than is characteristic of a number of others who have attempted to study the emotional and social characteristics of learning disabled children. On the other hand, there are a number of features of this study which are typical of almost all studies completed in this area of research, in addition to those already mentioned. The strengths and weaknesses of Bruininks' study will be discussed in the context of the limitations of this research project and those of the general body of literature now available concerning the emotional and social characteristics of learning disabled children.

Limitations of Research Concerning the Social and Emotional Development of Learning Disabled Children

Bruininks attempted to make certain that the learning disabled and contrast children utilized in this research project received adequate instruction. Her subjects were selected from seven classrooms
in two suburban school districts in one state (Minnesota). This should have ensured that all children received adequate academic instruction, although there was no stipulation to that effect. This particular state of affairs would appear to be an important consideration, since we would expect that a child's ability to perform at an optimal level while in school may be influenced, to some extent, by the quality of classroom instruction provided for that child. Certainly instructional quality can affect academic achievement levels and, perhaps, even the child's perception of self, although this has proven to be a difficult variable to evaluate.

The concept of adequate instruction is rarely addressed directly by researchers in this area. This may be a reflection of standards for the selection of LD children for study. Unfortunately, the question of adequate academic instruction would seem to hold special relevance for studies dealing with learning disabled children, particularly when those children are selected from school districts associated with the lower socio-economic strata of society. These (LD) children may not receive the same quality of instruction as do children living in more affluent school districts. Limited educational resources inevitably lead to limitations with respect to the special educational needs of learning disabled children.

Whenever children or adults are selected for study on most performance measures, an important criterion variable for matching subjects has proven to be general levels of intellectual functioning. The definition for learning disabilities adopted by the State of
Minnesota (which is the sole basis for subject selection in this study) states that the learning disabled child must have "general mental ability to make educational consideration as a mentally retarded... child unnecessary" (State Department of Education, 1973, p. 7).

Unfortunately, this does not ensure that children who are functioning above the average range on standardized measures of psychometric intelligence, were not included in one of the groups in Bruininks' study.

There may be some children in the contrast group who have superior "intellectual" abilities. This may influence the child's perception of self and other variables tested in Bruininks' study. Furthermore, when matching learning-disabled and contrast group children, there is most often some difficulty in matching these two groups for Full Scale IQ. This is because central information processing deficiencies (those of the LD group) are usually reflected in a somewhat attenuated score on one or more of the subtests of most IQ measures. For example, children with the so-called "ACID" pattern (which is characteristic of some children with information processing deficiencies, e.g., see Swartz, 1974) obtain somewhat low Arithmetic, Coding, Information and Digit Span subtest scaled scores on the Wechsler Intelligence Scale for Children (WISC: Wechsler, 1949). Since scores on those subtests contribute to the WISC Full Scale IQ score, these children obtain a somewhat lower Full Scale IQ than do non learning-disabled children in many cases.

In the present study, there was no mention of the levels of psychometric intelligence of the subjects, and we must assume that
the children in the two groups (LD and contrast) were not matched for Full Scale IQ. This is particularly disconcerting since Peter and Spreen (1979) have found that psychometric intelligence is the best predictor of the quality of social and emotional development in learning impaired children.

It is usually assumed that learning-disabled children have some deficiencies in learning as compared to their "normal" classmates. In Bruininks' study, only mean scores on achievement tests were provided to illustrate the learning deficiencies of the LD children as a group. In the absence of other criterion data, this does not ensure that all children exhibit a prespecified degree of academic retardation. Besides limiting the replicability of this study, this may also create further questions regarding the homogeneity of the population being studied.

If one is to adhere strictly to the definition of learning disabilities used for the selection of subjects in this study, it should be noted that it was possible for a child to be classified as learning disabled if he/she had learning problems which interfered with the educational rights of other children and which required attention and help beyond that which the regular instructional program can provide. Children who are emotionally disturbed to some degree could possibly be selected for study in accordance with this aspect of the learning disability definition. These children would appear to have learning difficulties and those learning difficulties may interfere with the educational rights of other children and require special educational assistance. Because there were no provisions made
for the exclusion of children who are considered to be primarily emotionally disturbed from this study, it is quite possible that there were some children in the learning disability group who did not exhibit abnormal information processing difficulties.

The exclusion of children with primary emotional disturbance from studies of learning disabled children is an important consideration since many children with learning difficulties do exhibit emotional and social difficulties (Black, 1974). In fact, the specific impetus for research in this area has been a result of this particular state of affairs. The crux of this issue emerges when one considers the difficulty in distinguishing some children who are learning impaired because of emotional difficulties from children who are learning impaired because of central information processing deficiencies. Some research-clinicians (e.g., Reitan & Heineman, 1968) would contend that it is necessary to employ a wide range of measures which are sensitive to cerebral dysfunction in children in order to make these kinds of decisions. With this in mind, it should be noted that some children in the experimental group in Bruininks' study may not have had a learning disability that was due to a central information processing deficiency. Furthermore, these (emotionally disturbed) children should be expected to deviate from normality on personality measures because of their emotional maladjustment.

The learning disability definition employed for subject selection in this study does not discriminate between children who are culturally (including linguistically) deprived and children who
have grown up in home environments that would tend to positively reinforce learning at school. Children who have English as a second language may not learn as well as other children because of a linguistic and/or cultural deprivation with respect to North American life. By the same token, children who live in homes in which the quality of parenting and, in general, the quality of home life are such that the child is not exposed to situations that would reinforce learning at school, are also educationally handicapped.

The fact that children were selected from two suburban school districts for Bruininks' study suggests that the latter was not a particular concern with respect to her subject selection. However, this does not preclude the possibility that there were some children in the LD group for which English was a second language. As was mentioned above, this particular state of affairs can cause learning difficulties and accompanying emotional and social maladaptation.

In sum, the following factors can interfere with appropriate subject selection for studies which purpose is to proffer information with respect to the learning disabled child:

1. the presence or absence of adequate academic instruction;
2. matching ID and contrast children for Full Scale IQ;
3. the degree of academic retardation as measured by a standardized test of academic achievement (e.g., the Wide Range Achievement Test [WRAT], Jastak & Jastak, 1965);
4. the exclusion of children who are primarily emotionally disturbed;
(5) the exclusion of children for whom there is some suspicion of cultural deprivation;

(6) the exclusion of children for whom the language of instruction in the school is not spoken in the home.

All of these factors were not addressed directly in the Bruninks study. The extent to which any or all of these factors are ignored by researchers in this field seriously undermines the validity of their test results. It has been common practice to overlook these considerations in many studies of learning disabled children, especially those investigating the emotional and social characteristics of these children.

Problems of Definition - Learning Disabilities

Much of the confusion in this area would appear to focus on common conceptions and misconceptions about what constitutes a learning disability and who is "learning disabled."

If one is to appreciate fully the difficulties of definition with respect to the term "learning disabled" it is first necessary to gain an appreciation of the impact of early investigators and their work in this field. In this regard, Heinz Werner and Alfred Strauss are viewed by many as being the outstanding early theorists and clinicians in the field of learning disabilities. It should be noted that these pioneers in the study of learning disordered children were strongly swayed by the theories and clinical techniques of Kurt Goldstein (Hallahan & Cruickshank, 1973).

Werner and Strauss were also influenced in their conception of
learning disorders by the population of children with whom they worked. By and large, these children were either neurologically impaired due to brain insult or frankly retarded. Many of the behaviours exhibited by these (very impaired) children were viewed as being similar to those behaviours attributed to the brain-injured adults (primarily of the "frontal lobe variety") studied by Goldstein.

The "perceptual-motor theorists," including Cruickshank, Kephart, Frostig, and others, were, in turn, influenced strongly by the earlier work of Werner and Strauss. These theorist/clinicians effectively molded educational policy with respect to the treatment of children with learning difficulties (especially in North America). To a large extent, children with learning difficulties were considered to be part of a rather homogeneous population requiring similar types of educational intervention for each child. However, it was discovered that some forms of learning disorders did not appear to require the same type of treatment as did others. For example, children with primary hearing loss did not benefit from "perceptual-motor" training as much as did children with motor handicaps.

In an attempt to address these and other issues, the Association for Children with Learning Disabilities was formed in the United States in 1963 (Hallahan & Cruickshank, 1973). Shortly afterwards, the term learning disabilities, was adopted by this group as a way of categorizing children with learning difficulties. Although some (e.g., Samuel Kirk) proposed to exclude mentally retarded children
and children with primary sensory handicaps, such as blindness or deafness from this group, other professionals, parents, and educators continued to apply the term to all children with learning difficulties. Some theorists had even specifically included children with primary emotional disorders in their definition of learning disabilities (e.g., Rabinovitch, 1959).

During this same period, medical practitioners deemed it necessary to put forward a medical classification that would deal with children who were thought to have (a) minimal brain injury and/or (b) learning and/or behavioural difficulties as a result of minimal neurological impairment. Clements (1966) formulated a definition of Minimal Brain Dysfunction (MBD) that was to serve these purposes. Unfortunately, the nature of this imperfect and ill-founded classification technique served to further cloud the issue of identifying learning disabled children for research and treatment (Rourke, 1975b).

Recently, legislative changes in the United States regarding the treatment of children with learning difficulties have added another dimension to this problem of definition. The present editor of the Journal of Learning Disabilities, Gerald Senf, discussed this perspective on the definition of learning disabilities. He stated the following:

- Federal and state definitions serve primarily economic, administrative and sociological functions. No definition of learning disabilities formulated at this level can be responsive to the diverse theoretical perspective of either research or practice. While some definition is clearly necessary and appears in learning disability regulations, research must continue to deal with a multiplicity
of conceptualizations and attendant operational definitions" (Senf, 1977, p. 537).

Two years later, in this same journal, Reger (1979) points out that an unsuccessful search continues for a definition. Rourke and Gates (1980), in their discussion of neuropsychological research in education, suggest that improved definitions will come "not only from consensus, but from research designed to clarify the validity of nosological labels" (Rourke & Gates, 1980, p. 3).

Clearly, there exists confusion, misunderstanding, and controversy with respect to a common definition of the learning disabled child. This poses a problem not only for those persons responsible for the treatment of such children, but also for researchers in this field. Unquestionably, the amount of information that a researcher can obtain from the test results and conclusions of other investigations in this field, is limited from the outset by the subject selection procedures and the definition of learning disabilities entertained by the studies (that were reviewed).

Bruininks' own conclusions concerning the possible limitations of her findings suggests yet another limitation with respect to most studies dealing with the social and emotional characteristics of learning disabled children. In this regard, she indicated that it may be necessary to divide learning disabled children into subtypes for study, since LD children do not form an homogeneous group. Another prominent researcher in this field has recently entertained a similar conclusion. In a monograph dealing with studies of the social skills and social relationships of learning
disabled children (commissioned by the U.S. Bureau of Education for the Handicapped, Office of Education) Bryan (1979) touched upon this issue. On the basis of her own clinical experience, rather extensive research, and her review, she stated the following:

It is clear that not all learning disabled children experience social problems. Individual differences, differences in sex, age and race, as well as the type and severity of learning problems no doubt contribute to determining which child has the social skill deficits (Bryan, 1979, pg. 1-41).

This "subtyping" issue with respect to the learning disabled child would appear to be quite salient for this review of the literature and the proposed research. Because of this, there will follow a general discussion of studies of learning disabled children which have shed further light on the question(s) of learning disability subtypes.

Studies of Subtypes of Learning Disabled Children

Recent studies of learning disabled children have demonstrated clearly the heterogeneous nature of this particular form of childhood pathology. This information has been gleaned from a number of sources, most commonly the result of research designed to address this issue directly.

More than one strategy has been employed in the determination of subtypes of learning disabled children. The following is an attempt to classify outstanding "subtyping" studies in terms of the general approach that was utilized.
Pathognomonic Sign Approach. This approach is most commonly associated with the diagnostic techniques of the medical profession. It is characterized by the identification of pathological "signs" or "symptoms" which are indicative of (in the case of the former) or suggestive of (in the case of the latter) a particular disease entity.

Elena Boder, a physician, utilized this approach in a study designed to identify subtypes of dyslexic children. Boder's (1973) pathognomonic sign approach amounted to a qualitative examination of the reading and spelling patterns of dyslexic children. She was able to identify three relatively separate subgroups on the basis of the approach that these children utilized when reading and spelling. Her subgroups included the following: (a) "dysphonetics," or children who were unable to integrate symbols with sounds; (b) "dyseidetics" or children who were unable to perceive letters and whole words as configurations or gestalts; and, (c) a third group that was considered to be some combination of both (a) and (b). None of these patterns were discovered among children with "normal" reading and spelling abilities. According to Boder (1973), long-term observation of these patterns revealed definitive prognostic and therapeutic implications which differed for each subgroup.

Sweeney and Rourke (1978) employed a version of the technique developed by Boder; that is, the qualitative examination of children's spelling performances. They compared the performances of two groups of retarded spellers (that were equated with respect to their level of performance in spelling but who differed in the
level of phonetic accuracy of their misspellings) with a group of normal spellers who were matched for age and WISC Performance IQ. Group comparisons were completed for 9-, 10- and 13-year-old children. It should be noted that the two groups of retarded spellers in this study were similar to the "dysphonetics" and "dyseidetics" described by Boder (1973).

Sweeney and Rourke found that the older phonetically inaccurate spellers differed from normals on a number of linguistic skills. In contrast, the performances of phonetically accurate spellers at this age level (13 years) differed from normals only when task demands involved fairly complex linguistic-cognitive operations. For the most part, the differences among the three groups were in evidence only at the older age levels studied.

These test results served to illustrate two important considerations: (1) similar levels of performance in a particular subject area may obscure differences in the neuropsychological adaptive ability structures of learning-disabled children; and (2) differences in the ability structures of learning disabled children are more evident at the older age levels.

**Configurational Analysis Approach.** The configurational analysis approach or pattern approach is used extensively in the evaluation of neuropsychological test results. It involves the identification of patterns of test results or "symptoms" that can be associated with other specific behavioural characteristics and behavioural descriptions. Although the configurational analysis approach is
only one of four inferential strategies used in the analysis of
neuropsychological test results, it overlaps considerably with the
others.

Mattis, French and Rapin (1975) utilized a version of this
approach when examining the test results of an extensive battery
administered to 113 children (aged 8 to 18 years) who had been
divided into three groups, in the following manner: (a) brain-
damaged readers; (b) brain-damaged dyslexics; and (c) non brain-
damaged dyslexics. When the performances of these three groups
were compared on a large number of variables, no significant
differences were found between the two dyslexic groups.

Following these analyses, these investigators sorted the
individual profile data into one of three classifications based on
the pattern of neuropsychological strengths and weaknesses exhibited
by each child. Their groups included the following: (1) a language
disorder group, which exhibited disorders of language often accom-
panied by dysnomia, and syntactic distortions; (2) an articulatory
and graphomotor dyscoordination group, which appeared to encounter
difficulty with the motor aspects of speech and dyscoordination of
fine and gross graphomotor abilities; and, (3) a visual-spatial
disorder group.

Rourke and Finlayson (1978) employed another variation of the
configurational analysis approach for the classification of learning
disabled children. They divided forty-five 9- to 14-year-old
children with learning disabilities whose WISC Full Scale IQs fell
within the 86-114 range into three groups on the basis of their patterns of reading, spelling, and arithmetic achievement on the WRAT. Group 1 was composed of children who were uniformly deficient in reading, spelling, and arithmetic; children in Group 2 were relatively adept at arithmetic as compared to their performance in reading and spelling; Group 3 was composed of children whose reading and spelling performances were average or above, but whose arithmetic performance was relatively deficient.

When comparisons were made among these groups, it was found that the performances of children in Groups 1 and 2 were superior to those of children in Group 3 on measures of visual-perceptual and visual-spatial abilities; Group 3 children performed at a level superior to Group 1 and Group 2 children on measures of verbal and auditory-perceptual abilities.

A second, complementary study (Rourke & Strang, 1978) utilized the same forty-five 9- to 14-year old children and compared their performances on tests for motor, psychomotor, and tactile-perceptual abilities. No outstanding differences were found between the three groups on the relatively simple motor measures. Children in Group 3 were found to be generally deficient on the more complex, heterogeneous psychomotor measures and on a composite tactile-perceptual score.

The combined results of these two studies demonstrated clearly that there were differences in the neuropsychological ability structures of children in these three groups. This was found to be essentially the case when comparing the performances of Group 3
children with those of Group 2 children. In this regard, it was found that children in Group 3 performed most poorly on tests that require abilities thought to be subserved primarily by the right cerebral hemisphere, while children in Group 2 exhibited outstanding difficulties with those skills thought to be subserved primarily by the left cerebral hemisphere.

**Multivariate Statistical Approach.** This approach (which has proven to be successful in classifying subtypes of learning disabled children) is characterized by the employment of multivariate statistical techniques with a wide variety of neuropsychological test results. Utilizing this approach, Doehring and Hoshko (1977) applied a Q-type factor analysis to 31 measures of reading-related children. Their analysis identified three subtypes of reading problems in each of the two samples examined. In a second study (Doehring, Hoshko & Bryans, 1979), the technique of cluster-analysis was used to re-examine the same groups of children. They found that the same subtypes emerged from the original data when the performances of children with reading problems were combined with those of normal readers. These two studies demonstrated that, even with the use of different statistical classification procedures, the same subtypes of reading-disabled children emerged. These studies also illustrated the usefulness of multivariate statistical techniques for the identification of subgroups of learning disabled children, when test results from a relatively large number of performance variables were to be considered.

It was for these reasons that Petruskas and Rourke (1979)
utilized the Q-type factor analysis techniques when evaluating the results of a battery of neuropsychological tests administered to 160 7- and 8-year-old children (133 retarded readers and 26 normals). Three reliable factors were obtained from the combined sample. The largest type appeared to have a clear deficiency in auditory-verbal and language-related skills, while having well-developed visual-spatial and eye-hand coordination abilities. A second type exhibited a sequencing deficit as well as clear evidence of finger agnosia. A third type exhibited deficiencies in verbal-retentive and expressive language skills as well as eye-hand coordination problems. Petrauskas and Rourke (1975) suggested that these subtypes of learning-disabled children correspond to subtypes which had been identified in previous research by other investigators.

More recently, Fisk and Rourke (1979) applied the Q-factor analysis technique to 264 learning disabled children between the ages of 9.0 and 14.9 years. These children had received an extensive battery of neuropsychological tests. Subjects were divided into three age-based samples (9-10 years, 11-12 years, and 13-14 years).

Three subtypes of learning disabled children were replicated across two or three of these age levels. The largest subtype appeared to have deficiencies in auditory-verbal and language-related abilities, coupled with well-developed visual-spatial, tactile- and kinesthetic-perceptual, and motor abilities. A second subtype was characterized by poor auditory-verbal abilities and finger agnosia. A third type also exhibited auditory-verbal
deficiencies in addition to marked impairment on tests for fingertip number-writing. The results obtained generally appeared to indicate that particular subtypes of learning-disabled children identified at one age level in this study were quite similar to those subtypes identified at other age levels. However, the third subtype (those children characterized by having outstandingly poor scores on fingertip number-writing) did not emerge in the 9- to 10-year old sample. The authors suggested that this subtype may be a variation of subtypes 1 and 2 and that it is only differentiated at older age levels.

**Personality Characteristics of Subtypes of Learning Disabled Children**

The identification and delineation of subtypes of learning-disabled children is a relatively recent development in this field. The application of similar techniques to the identification of patterns of social and/or emotional functioning in learning-disabled children is almost non-existent, with one notable exception.

James Porter (1980) utilized the Q-type factor analysis technique for the purposes of the identification of subtypes of learning disabled children in terms of their patterns of personality functioning. He screened carefully and chose 100 randomly selected learning disabled children who conformed to the definition of learning disabilities employed in the research of Rourke (see Rourke, 1975a). Each child in this study had been referred to the Neuropsychology Department of the Regional Children's Centre, Windsor, Ontario because of learning and/or behavioural difficulties due to suspected cerebral dysfunction. Every child had received a
full battery of neuropsychological tests. In addition, each child's mother had completed the Personality Inventory for Children (PIC).

Porter used the T-scores from the PIC subscales as raw data for his analysis. He found essentially that four personality pattern subtypes emerged, as well as a group of children who could not be classified into a reliable subtype. The largest subtype of those children who were classified tended to demonstrate quite adequate socio-emotional functioning. The differentiating characteristics of this particular PIC profile subtype in comparison with the other three subtypes were the outstanding concerns of the mothers with regard to the intellectual competence of their children and the relative lack of concern with respect to the presence of delinquent and/or asocial behaviours.

Subtype 2 exhibited marked psychological disturbance reflected by internalized socio-emotional difficulties. These children obtained outstanding elevations on the Depression, Anxiety, and Psychosis profile scales. Subtype 3 children appeared to have a great deal of somatic concerns, or at least more concerns in this area than were characteristic of the other three groups. In addition, it would appear that the mothers of Subtype 3 children yielded somewhat elevated T-scores on the F scale, which may suggest deliberate or unintentional exaggeration of symptoms in these cases. Children in Subtype 4 appeared to have a behavioural disturbance which includes over-activity, distractibility, interpersonal
insensitivity, and anti-social behaviour. Of note were the elevated Family and Delinquency scales and the outstandingly low Defensive scale T-scores obtained for these children.

Specific Factors Affecting the Personality Functioning of Learning Disordered Children

Since it has been established that there are subtypes of learning disabled children, the possibility exists that the distinguishing cognitive characteristics of these subtypes may, in fact, influence personality development for these children. If this is the case, it may be found that children with a specific learning disability will tend towards one personality subtype while a different state of affairs may exist for another type of learning disability. It should be noted that this statement is only a hypothesis at this time, because there is no empirical evidence which addresses this issue in a direct fashion.

However, there is some evidence which would support the notion that children with specific visual-spatial deficiencies, in combination with seemingly adequate language skills, are quite prone to abnormal social and emotional development and tend to have many problems with normal adjustment during adulthood. Myklebust (1975) describes children with "non-verbal" learning disabilities as having poor social and emotional adjustment during childhood and as being the most "at risk" of all learning disability groups for poor adult adjustment. These statements were made on the basis of his clinical experience with learning disabled children.
Rourke and Strang (1981) in their review of arithmetic disorders in childhood, point out that children with "specific" problems in arithmetic are prone to poor social and emotional adjustment. Earlier studies (Rourke & Finlayson, 1978; Rourke & Strang, 1978) had indicated that these arithmetic disordered children had relatively well-developed "automatic" verbal and auditory-perceptual skills and quite poor psychomotor, tactile-perceptual, visual-perceptual, and visual-spatial skills. These arithmetic disordered children would appear to be similar to the "non-verbal" learning disabled children described by Myklebust.

Strang and Rourke (Reference Note 1) compared the performances of children with specific arithmetic disorders and children with specific reading and spelling disabilities on a relatively complex non-verbal reasoning and concept-formation test (Halstead Category Test; Reitan, 1966b). These children constituted Group 2 and Group 3 in the Rourke and Finlayson (1978) and Rourke and Strang (1978) studies. Significant differences in favour of the children with specific reading and spelling disabilities were obtained when their performances were compared. The possible relationship between non-verbal concept-formation deficiencies and emotional maladjustment was discussed. It should be noted that the Halstead Category Test has been found in previous research to be sensitive to both brain-damage and emotional maladjustment in children (Reed & Reed, 1967; Knights & Tymchuk, 1968).

In a very recent attempt to study further the behavioural characteristics of children with different patterns of neuropsycho-
logical abilities, Ozols (1980) selected a group of learning-disabled
children having auditory-perceptual difficulties primarily and a
group of learning disabled children having visual-spatial difficulties
primarily. These two groups of children were compared in terms of
their ability to recognize facial expressions and non-verbal gestures,
and with respect to their verbal labelling skills and their explana-
tions of feelings. Some differences were found between these two
groups on the tasks (in favour of the group of children having
auditory-perceptual difficulties). However, the limited number of
subjects in the groups \( n = 7 \) and limitations due to subject and
task selection prevented more dramatic statistical results from
being obtained.

The relationship between visual-spatial and analytic deficiencies
and psychiatric illness has been long established although it is
not well understood. For example, Belmont, Birch, Klein, and
Pollack (1964) divided voluntarily hospitalized adult psychiatric
patients between the ages of 16 and 46 years into three groups.
Fourteen were schizophrenic patients who had childhood histories
of marked behavioural disorder. Twenty-three schizophrenic patients
without abnormal childhood histories were in the second group, and
19 non-schizophrenic patients formed a third group. The results
indicated that, although both schizophrenic groups were deficient
in perceptual-analytic ability, this was found to be particularly
the case for the childhood disordered group. Other findings
concerning the childhood disordered group included outstanding
deficiencies with respect to thought disorder and social skills.
Quitkin and Klein (1969) investigated two behavioural syndromes in young adults thought to be related to possible minimal brain dysfunction. Their sample consisted of 105 adolescents and young adult voluntary psychiatric patients. These patients were divided into four groups on the basis of the presence of "soft" behavioural organic signs and clinical psychiatric history. The four groups included the following: (1) no soft signs; (2) borderline; (3) impulsive-destructive; and, (4) socially awkward and withdrawn. The socially awkward withdrawn patients exhibited significantly more evidence of a pattern of cognitive and social defect, psychomotor disorganization, evidence of congenital abnormality, evidence of CNS trauma, evidence of infection, "organic" indicators on mental status, and asociality.

Of particular note were the outstanding Verbal IQ-Performance IQ discrepancies on the Wechsler Adult Intelligence Scale (WAIS: Wechsler, 1949) for the socially awkward and withdrawn group. These patients obtained a mean WAIS Full Scale IQ of 94.6, a mean WAIS Verbal IQ of 103.5 and a mean WAIS Performance IQ of 84.8. Furthermore, an interesting pattern of subtest scaled scores obtained on the WAIS Verbal scale. In this regard, the Arithmetic, Digit Span, and Comprehension mean subtest scaled scores were below 10 while the Similarities and Vocabulary mean subtest scaled scores were at least 11. It is also worthy of mention that the Performance subtest scaled scores were uniformly depressed, with the Object Assembly subtest being lowest (having a mean subtest scaled score of 6.8).

On the basis of this evidence, there is good reason to hypothesize that children with outstanding visual-perceptual and visual-
spatial deficiencies would be prone to emotional and social maladjustment. It should be noted that, in every case, the children or adults described had seemingly adequate "automatic" verbal abilities. In this regard, it has been observed by the author that the ability of these children to utilize words for verbal expression clearly outdistances their ability to use language to aid in reasoning capacities.

Outstanding visual-spatial and visual-perceptual deficiencies, combined with seemingly adequate "automatic" verbal and auditory-perceptual abilities, would appear to be the set of circumstances which may influence adversely the emotional and social growth of some learning disabled children. By way of contrast, it would appear that most studies dealing with the emotional and social characteristics of learning disabled children have attempted to investigate rather general factors which may affect all learning-disabled children. Some of these general factors will be discussed in the next section.

General Factors Influencing the Emotional and Social Development of Learning Disabled Children

It would appear that there are a number of general factors which may influence the emotional and social development of most learning disabled children. The fact that significant results have been obtained when comparing rather heterogeneous groups of learning disabled children with normal children on a given variable suggests that (as long as the measures are valid for use with learning disabled children) there may be some rather general factors which are common to children with learning difficulties.
There is a growing body of literature which suggests that family factors may contribute to the emotional and social maladjustment of some learning disabled children. It would appear that many parents of learning disabled children view these children in a light that is less favourable than the way in which other parents view their "normal" children. The study of Seigler and Gynther (1960) serves to illustrate this point.

Using the Interpersonal Check List, these authors compared the responses of parents of 10 reading disabled boys to those of the parents of 10 normal boys. They found that the parents of learning disabled children (1) used critical and derogatory descriptive terms more frequently with their children; (2) described their children as being more aggressive, distrustful or dependent; (3) disagree in their descriptions of their children more often; and (4) tend to devalue their children's personalities.

In a well-controlled study, McDermott (1977) attempted to discern whether either or both parents of a diagnosed reading-retarded boy would interact differentially with him in comparison with his normally-achieving male sibling. McDermott found that the fathers were more overtly negative, rejecting, and derogating with the reading disabled boys than their normally-achieving siblings. Mothers were found to be generally more positive with the normally-achieving siblings than with the reading disabled boys.

McDermott's study suggests that complex interactions within the nuclear family may prove to be a significant deterrent to normal emotional and/or social development for learning disabled children.
Furthermore, the differential treatment that learning disabled children receive from their parents may not bear any direct relationship to the type of learning disability per se. However, there may exist at least one particular set of circumstances that is an exception to this supposition. If one ascribes to the possibility that some predispositions for learning disabilities are transmitted genetically (e.g., Yule & Rutter, 1976), it should follow that, in a relatively large sample of randomly selected learning disabled children, some parents will also be learning disabled. In this regard, Lenkovsky and Serposnek (1978) have suggested that learning disabled parents exhibit more persistent emotional problems and interact less favourably within the family structure than do parents who did not incur academic difficulties. This may pose some special problems for the family as well as for the emotional and social development of the learning disabled child.

Another factor which may interact unfavourably with the emotional and social growth of learning disabled children is the reaction of learning disabled children to the demands of the academic situation. Certainly, these children must experience more day-to-day frustration with academic learning than do their normally-achieving peers. In this vein, Black (1974) suggests that the social and emotional problems exhibited by a large number of learning disabled children are secondary to their academic difficulties. He feels that the frustration that these children experience as a result of academic failure leads to anti-social and inappropriate outbursts in many instances.
If frustration with the academic situation is a general factor influencing the social and emotional development of learning disabled children, it may be that the learning disabled child's specific academic programme and classroom-setting can have some effect upon minimizing this frustration. The study of Ribner (1978) provides us with some insight regarding this situation. In her study, questionnaires were administered to three groups of children: normal achievers in the regular classroom; learning disabled children in special classes; and, children in regular classes who were subsequently identified as learning disabled. The questionnaires were designed to measure "self-perceived general competency."

Ribner found that the normal achievers demonstrated significantly higher scores on this measure than did the learning disabled children who had not yet been identified. In contrast, the learning disabled children in special classes achieved intermediate scores which did not differ significantly from those of either regular class group. In spite of the limitations of a study such as this, it would still appear that those learning disabled children receiving special class placement had a higher level of self-esteem than did learning disabled children in the regular classroom.

Some support for this contention was found in a recent study completed by Boersma, Chapman and Battle (1979). These researchers evaluated changes in academic self concept for elementary special education students receiving full-time remedial placement. The dependent measure in this study was the Students Perception of Ability Scale. The results obtained revealed significant increases
in academic self-concept, especially in the areas of reading/spelling and general confidence. Academic gains and more positive peer reference group comparisons were suggested as possible factors contributing to the positive changes in academic self-concept for the learning disabled children.

Together, these studies suggest that frustration in the academic situation can affect adversely the emotional and social welfare of the learning disabled child. The frustration that learning disabled children experience would appear to be affected somewhat by their specific academic programme and classroom placement. In this regard, there is some evidence to suggest that learning disabled children in special education classes feel better about themselves and their school performances than do learning disabled children in regular classroom setting.

The frustration that children experience because of academic learning difficulties due to learning disabilities may become more evident as (a) the demands of the academic situation increase, and (b) children are exposed to academic failure for a greater length of time. Increased frustration levels may be reflected by the presence of a greater number of maladaptive behaviours and more substantial personality disturbance for the learning disabled child. It would seem to follow that older learning disabled children should exhibit a greater degree of personality disturbance than would younger learning disabled children, because of the cumulative effects of feelings of inadequacy and frustration related primarily to their rather limited academic achievement. Although it has been
mentioned by some that the age of a learning disabled child may influence the extent to which he/she exhibits emotional and/or social maladjustment (e.g., Bryan, 1979b), this has not yet been investigated in a systematic fashion.

**Summary**

There would appear to be rather distinct limitations in the interpretability of results obtained from most investigations of the social and emotional characteristics of learning disabled children. Included among the shortcomings of many research projects are (a) inadequate subject selection, and (b) a somewhat naive understanding of learning disabilities of children. A lack of consensus concerning the definition for a learning disability has contributed to this particular state of affairs. Unquestionably, the impact of early theorists in the field of learning disabilities, the attempts of the educational and medical professions to classify and treat learning and/or behavioural deficiencies in childhood and, to some extent, recent legislation in the United States, have added to the confusion regarding the term "learning disability."

Because of this lack of general agreement, there has been very little systematic, reliable research carried out in this area. An appreciation of the "subtype" issue with respect to learning disabilities in children underscores this point. In this regard, it is clear that one cannot draw meaningful conclusions about specific groups of learning disabled children when only heterogeneous groups of learning disabled children are studied.
On the other hand, some of the significant results obtained from studies involving comparisons of groups of dissimilar learning disabled children and "normal" children suggest that general factors may exist which affect adversely the personality development of the learning disabled child. For example, there is some evidence available to support the contention that the learning impaired child is perceived and treated differently by his/her parents than are normally achieving children by their parents. This may be one factor contributing to the somewhat low self-concept exhibited by many learning disabled children.

Perhaps the most obvious and well-established general factor thought to be affecting adversely the personality development of learning disabled children is the frustration that these children reportedly experience as a result of academic failure. The purpose of Study 1 is to evaluate the significance of age for the degree of personality disturbance commonly associated with learning disabilities in children. It is expected that the cumulative frustration associated primarily with persistent academic failure will contribute to greater personality maladjustment as the learning disabled child grows older.

The Definitions, Expectations, Method, Results and Discussion for Study 1 will be presented first for the sake of clarity. These will be followed by the Definitions, Expectations, Method, Results and Discussion for Study 2.
STUDY 1

Definitions

(a) Personality disturbance. This is measured and defined in terms of the T score elevations for any or all of the following PIC profile scales: Somatic Concern; Depression; Family Relations; Delinquency; Withdrawal; Anxiety; Psychosis; Hyperactivity; Social Skills.

Expectations

(1) Older learning disabled children will exhibit more evidence of personality disturbance than will younger learning disabled children.
CHAPTER III

METHOD

(STUDY 1)

Subjects

The 60 subjects in this study were chosen from over 500 children who had been referred to the Department of Neuropsychology, Regional Children's Centre, Windsor Western Hospital Centre, Windsor, Ontario for a complete neuropsychological assessment. These children were referred because of learning, "perceptual", or behavioural difficulties. Furthermore, it was suspected that a central information processing deficiency was contributing directly to the problems that these children were exhibiting. For all potential subjects, the Personality Inventory for Children was completed by the child's mother.

All of the children in this study had attended school since the age of 6 years and fell within the Full Scale IQ range of 85-116 on the Wechsler Intelligence Scale for Children (WISC; Wechsler, 1949). Every child had at least one centile score on the Wide Range Achievement Test that was less than or equal to 27. None of the subjects had learning difficulties that could be attributed to a primary sensory disorder. Children with defective hearing or vision
were eliminated from the subject pool.

Children who exhibited in their histories evidence of primary emotional disturbance and/or cultural deprivation were not included in this study. The criteria employed for the elimination of children because of suspected primary emotional disturbance or cultural deprivation included the following: (1) a statement contained in a psychiatrist's or psychologist's report indicating that, in his/her opinion, the child was primarily emotionally disturbed; (2) any records indicating that the child has been involved in the past, or present, or will be involved in the future, in a treatment programme designed specifically for children with behavioural difficulties; (3) any evidence of the involvement of the Children's Aid Society; (4) any other evidence in the child's history (e.g., a physician's or school report indicating physical neglect) which indicated that there had been significant cultural deprivation.

Finally, for each child, there was some evidence to support the hypothesis that a central information processing deficiency was contributing to their adaptive difficulties. This was accomplished through a complete evaluation of the neuropsychological test results of each child by the author, including the employment of the following interpretive strategies: level of performance; pathognomonic sign; comparisons of performances on the two sides of the body; and, configurational analysis. Any child who failed to exhibit in his/her neuropsychological profile inferential evidence of a central information processing deficiency was excluded from the study.
When the above criteria was met, children were then chosen on the basis of their chronological age to fit one of three groups; there were 20 subjects in each group. The first group of children were 8-year-olds ranging in age from 8 years, 0 months to 8 years, 11 months. 10-year-old children comprised a second group. These children were between the ages of 10 years, 0 months and 10 years, 11 months. A third group of children were 12-year-olds between the ages of 12 years, 0 months and 12 years, 11 months. These three groups were matched for IQ range and educational-cultural milieu (see Table 1). In addition, the groups were matched for sex. There were 16 boys and 4 girls in each of the three groups.

Test Measures

The Personality Inventory for Children (PIC) "is an empirically and rationally constructed instrument which seeks to provide comprehensive and clinically relevant personality descriptions of individuals primarily in the range of 6 to 16 years of age" (Wirt, Lachar, Klinedinst, & Seat, 1977, p. 1). It is composed of 600 true-false questions regarding the child's behaviour, disposition, interpersonal relations, and attitudes, and is to be completed by one of the child's parents. In the present investigation, the inventories were completed by the subject's mother.

The PIC contains 33 scales. Of these 33 scales, there are 16 profile scales and 15 supplementary scales. The PIC profile includes all scales judged to be most important. The PIC profile scales can be divided further into three validity scales (the Lie, F and Defensiveness scales), one screening scale for general maladjustment.
**TABLE 1**

MEANS (STANDARD DEVIATIONS) FOR AGE, WISC FULL SCALE IQ, WISC VERBAL IQ, WISC PERFORMANCE IQ, AND WRAT READING, SPELLING AND ARITHMETIC SUBTEST CENTILE SCORES FOR STUDY 1 SUBJECTS (N = 20 IN EACH GROUP)

<table>
<thead>
<tr>
<th>Variables</th>
<th>8-year-olds</th>
<th>10-year-olds</th>
<th>12-year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (months)</td>
<td>103.45 (3.48)</td>
<td>124.40 (3.69)</td>
<td>148.90 (3.14)</td>
</tr>
<tr>
<td>WISC Full Scale IQ</td>
<td>99.85 (6.42)</td>
<td>99.00 (6.71)</td>
<td>98.80 (8.77)</td>
</tr>
<tr>
<td>WISC Verbal IQ</td>
<td>96.60 (7.74)</td>
<td>94.60 (7.52)</td>
<td>93.60 (7.71)</td>
</tr>
<tr>
<td>WISC Performance IQ</td>
<td>103.95 (7.17)</td>
<td>104.05 (8.39)</td>
<td>104.50 (11.00)</td>
</tr>
<tr>
<td>WRAT Reading (Centile)</td>
<td>18.65 (17.26)</td>
<td>28.70 (22.06)</td>
<td>20.20 (18.14)</td>
</tr>
<tr>
<td>WRAT Spelling (Centile)</td>
<td>15.80 (7.61)</td>
<td>21.10 (16.50)</td>
<td>13.25 (19.22)</td>
</tr>
<tr>
<td>WRAT Arithmetic (Centile)ab</td>
<td>27.00 (12.34)</td>
<td>18.20 (8.76)</td>
<td>12.20 (12.62)</td>
</tr>
</tbody>
</table>

(a) Comparison between 8-year-olds and 10-year-olds yields p < .05
(b) Comparison between 8-year-olds and 12-year-olds yields p < .01
(the Adjustment scale), and $\frac{1}{2}$ clinical scales. The clinical scales include the following: Achievement; Intellectual Screening; Development; Somatic Concern; Depression; Family Relations; Delinquency; Withdrawal; Anxiety; Psychosis; Hyperactivity; and Social Skills. Score elevations in the positive direction (e.g., above 70 T) increase the likelihood of significant pathology for each of these scales.

The dependent measures for this study included the 16 profile scales of the Personality Inventory for Children. Porter (1980) found that meaningful differences between subtypes of learning-disabled children could be determined with these scales. Furthermore, the profile scales of the PIC provide sufficient clinical information to make possible an evaluation of the child's social, emotional and behavioural functioning. PIC profile scale descriptions can be found in Table 2.

It should be noted that the Lie, F, and Defensiveness scales were designed specifically to measure respondent distortion, bias and response style. This allows the clinician to make some judgments about parental characteristics, and provided a method of eliminating from this study those PICs that had been seriously distorted. In this regard, a visual scanning of the three validity scales (the Lie, F, and Defensiveness scales) was completed first as a validity check for each subject. Those profiles having Lie scale elevations of greater than 69 T or F scale elevations of greater than 121 T, or Defensiveness scale elevations of greater than 80 T were not included in this study. These particular T score values were chosen to
<table>
<thead>
<tr>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lie (L)</td>
<td>Designed to identify a defensive response set manifested by a tendency to ascribe the most virtuous of behaviours, and to deny minor commonly-occurring behaviour problems, in the child described.</td>
</tr>
<tr>
<td>F</td>
<td>Designed to identify possible deviant response sets such as deliberate or unintentional exaggeration of symptoms or random responding. In the general clinic population, F appears to reflect relative intensity or severity of symptoms. Atypical response sets tend to be characterized by extremely high F Scale elevations (i.e., T-score 121).</td>
</tr>
<tr>
<td>Defensiveness (DEF)</td>
<td>Designed to measure the tendency, in the respondent, to be defensive in reporting on the child's behaviour.</td>
</tr>
<tr>
<td>Adjustment (ADJ)</td>
<td>A screening scale, designed to identify children in need of a psychological evaluation, and as a general measure of poor psychological adjustment. The ADJ scale tends to be elevated in the profiles of the great majority of children seen for psychological evaluations for whatever reason.</td>
</tr>
<tr>
<td>Achievement (ACH)</td>
<td>Designed to assist in the identification of children whose academic achievement is significantly below age expectation. This scale has its highest loading on the Cognitive Development factor (Lachar, 1975).</td>
</tr>
<tr>
<td>Intellectual Screening (IS)</td>
<td>A screening device to identify children whose difficulty might be due to impaired intellectual functioning. IS is designed to provide an index of need for an indepth intellectual assessment. This scale has its highest loading on the Cognitive Development factor (Lachar, 1975).</td>
</tr>
</tbody>
</table>

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TABLE 2 Continued

<table>
<thead>
<tr>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development (DVL)</td>
<td>Designed to measure poor general intellectual and physical development. This scale has its highest loading on the Cognitive Development factor (Lachar, 1975).</td>
</tr>
<tr>
<td>Somatic Concern (SCM)</td>
<td>Composed of items which measure various health related variables (frequency and seriousness of somatic complaints and illnesses, adjustment to illness, appetite and eating habits, sleep patterns, energy and strength, headaches and stomach aches, and physical basis for symptoms). This scale has its highest loading on the Somatic Concern factor (Lachar, 1975).</td>
</tr>
<tr>
<td>Depression (D)</td>
<td>Composed of items judged to reflect childhood depression (brooding, crying spells, lack of energy, anhedonia, pessimism, poor self-concept, uncommunicativeness, etc.). This scale has its highest loading on the Psychopathology-Internalization factor (Lachar, 1975).</td>
</tr>
<tr>
<td>Family Relations (FAM)</td>
<td>Designed to assess family effectiveness and cohesion (level of parental role effectiveness, ability to cooperate in making family decisions, family involvement in community affairs, presence of feelings of love and happiness in the home, parental emotional adjustment, appropriateness of discipline, and concern for the rights of child). This scale has its highest loading on the Acting Out-Conduct Disorder-Externalization factor (Lachar, 1975).</td>
</tr>
<tr>
<td>Delinquency (DQ)</td>
<td>A concurrent measure of delinquent tendencies (interpersonal insensitivity, disregard for limits, anti-social tendencies, impulsivity, interpersonal hostility, etc.). This scale has its highest loading on the Acting Out-Conduct Disorder-Externalization factor (Lachar, 1975).</td>
</tr>
</tbody>
</table>

Continued......
TABLE 2 Continued

<table>
<thead>
<tr>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Withdrawal (WDL)</td>
<td>Designed to measure withdrawal from social contact. This scale has its highest loading on the Psychopathology-Internalization factor (Lachar, 1975).</td>
</tr>
<tr>
<td>Anxiety (ANX)</td>
<td>Containing items that measure limited frustration tolerance, exaggeration of problems and concerns, worries which reflect parental concerns, behavioural and physiological correlates of anxiety, irrational fears and worries, and nightmares. This scale has its highest loading on the Psychopathology-Internalization factor (Lachar, 1975).</td>
</tr>
<tr>
<td>Psychosis (PSY)</td>
<td>Designed to discriminate children with psychotic symptomatology from normal, behaviourally disturbed non-psychotic and retarded children. High scoring children tend to be withdrawn and anxious, have poor social skills, and evidence indications of reality distortion. This scale has its highest factor on the Psychopathology-Internalization factor (Lachar, 1975).</td>
</tr>
<tr>
<td>Hyperactivity (HPR)</td>
<td>Designed to identify children who display characteristics frequently associated with the &quot;hyperkinetic syndrome.&quot; This scale has its highest loading on the Activity Level factor (Lachar, 1975).</td>
</tr>
</tbody>
</table>

Continued....
<table>
<thead>
<tr>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social Skills</td>
<td>Composed of items selected to measure various characteristics which reflect effective social relations in childhood (ability to lead and to follow, level of active participation in organized activities, self-confidence and poise in social situations, and social comprehension and tact in interpersonal relations). This scale has its highest loading on the Psychopathology-Internalization factor (Lachar, 1975).</td>
</tr>
</tbody>
</table>

The scale descriptions were adapted and summarized by Porter (1980) from those presented in the PIC manual (Wirt, Lachar, Klinedinst & Seat, 1977). Scale factor correlates derived from the study of Lachar (1975) were added to the scale descriptions.

A computer programme (Gudobba & Grisell, 1979) was employed to score the PIC inventories of most of the subjects in these studies including the conversion of raw scores into T-scores. Some PICs were scored by hand, using templates provided as part of the test paraphernalia. In these cases, the raw scores were converted into T-scores for the validity and clinical scales by using the profile form conversion scales.
CHAPTER IV
RESULTS
(STUDY 1)

Pre-selected PIC scaled scores were added together to form three unique composite scores for each subject. A "cognitive development" composite score was formed by adding together T score values for the Development, Achievement, and Intellectual Screening Scales for each subject. The T scores derived from the Depression, Withdrawal, Anxiety, Psychosis, and Social Skills scales were combined to form a composite "psychopathology-internalization" score for each subject. The T scores from all PIC clinical profile scales, including the Somatic Concern, Depression, Family Relations, Delinquency, Withdrawal, Anxiety, Psychosis, Hyperactivity, Social Skills scales, were included in a composite "personality deviance" score for each subject.

The "cognitive development" composite score included T scores from those profile scales which are included in Lachar's (Lachar, 1975) "cognitive development" factor. The "psychopathology-internalization" composite score is comprised of the T scores from those PIC profile scales which are included in Lachar's "psychopathology-internalization" factor (Lachar, 1975). The "personality deviance" composite score was formed to provide a general reflection of the cumulative PIC clinical profile T score elevations for each child.
These three composite scores were the dependent measures for a one-way analysis of variance (ANOVA) to test for significant differences between the three groups.

The results of this one-way analysis of variance for the composite "cognitive development", "psychopathology-internalization" and "personality deviance" scores yielded significant group differences on the "cognitive development" measure $F(2, 57) = 3.11, p < .05$. Comparisons between means using the Newman-Keuls procedure and the means and standard deviations for each composite score are presented in Table 3. It was found that higher T score elevations were obtained for the 8-year-olds on the combined scales comprising the "cognitive development" score than for the 12-year-olds on this score, $(p < .05)$. Because "psychopathology-internalization" and "personality deviance" mean scores for 10- and 12-year-olds were higher than those scores for 8-year-olds, planned comparisons between group means were completed for each variable. No pair of group means or comparisons between (orthogonal) group mean combinations produced differences which reached acceptable levels of statistical significance. Figure 1 presents a graphic illustration of group differences for these (composite score) variables.

It was noted that 12-year-old children obtained higher mean PIC T score values than 8-year-old children on eight of the nine scales associated with the "personality deviance" measure. Using Fisher's Exact Test it was determined that the probability of this comparison being due to chance was $p < .02$. Both 10-year-olds and 12-year-olds obtained higher mean PIC T score values than did the
<table>
<thead>
<tr>
<th>Variables</th>
<th>8-year-olds</th>
<th>10-year-olds</th>
<th>12-year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Development Score (ACH + IS + DVL)</td>
<td>221.70 (25.83)</td>
<td>210.10 (30.47)</td>
<td>198.85 (30.43)</td>
</tr>
<tr>
<td>Psychopathology-Internalization Score (D + WDL + ANX + PSY + SSK)</td>
<td>281.10 (43.18)</td>
<td>295.70 (48.53)</td>
<td>301.25 (68.75)</td>
</tr>
<tr>
<td>Personality Deviance Score (SQM + D + FAM + DLQ + WDL + ANX + PSY + HPR + SSK)</td>
<td>498.25 (59.15)</td>
<td>529.20 (63.74)</td>
<td>530.35 (84.82)</td>
</tr>
</tbody>
</table>

(a) Comparison between 8-year-olds and 12-year-olds yields $p < .05$
Figure 1

Study 1: Mean PIC Cognitive Development, Psychopathology-Internalization and Personality Deviance Scores (n = 20 in each group).
8-year-olds on all of the five scales associated with the "psychopathology-internalization" composite score. The probability of the 12-year-olds or the 10-year-olds obtaining higher mean PIC T score values than the 8-year-olds on five of five pre-selected scales was $p < .006$.

Next, all PIC scales were compared for the three groups by means of a one-way multivariate analysis of variance (Harris, 1975). The raw data for this analysis were the PIC T scores for each scale.

The means and standard deviations for the PIC profile scales are presented in Table 4. The MANOVA failed to yield a root that was significant beyond the .05 level. The Hotelling-Lawley Trace, Pillai's Trace, and Wilk's Criterion were computed.

Univariate $F$ tests yielded significant group differences for two variables: Intellectual Screening, $F (2, 57) = 5.99, p < .004$; and, Delinquency, $F (2, 57) = 3.50, p < .03$. Comparisons between means using the Newman-Keuls procedure are presented in Table 4.

For the Intellectual Screening scale, there was more concern about 8-year-olds than for 12-year-olds, ($p < .01$). Higher T score elevations were found for 10-year-olds than for 8-year-olds ($p < .05$) on the Delinquency scale. Figure 2 presents a graphic illustration of mean PIC profile scale group differences.
**TABLE 4**

MEANS (STANDARD DEVIATIONS) FOR PIC PROFILE SCALES

FOR STUDY 1 SUBJECTS (N = 20 IN EACH GROUP)

<table>
<thead>
<tr>
<th>PIC Scale</th>
<th>8-year-olds</th>
<th>10-year-olds</th>
<th>12-year-olds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lie (L)</td>
<td>44.75 (7.46)</td>
<td>46.10 (6.72)</td>
<td>47.00 (11.56)</td>
</tr>
<tr>
<td>F (F)</td>
<td>56.95 (13.32)</td>
<td>61.75 (15.59)</td>
<td>59.00 (21.80)</td>
</tr>
<tr>
<td>Defensiveness (DEF)</td>
<td>44.75 (7.86)</td>
<td>45.45 (11.52)</td>
<td>49.15 (11.78)</td>
</tr>
<tr>
<td>Adjustment (ADJ)</td>
<td>67.10 (9.34)</td>
<td>68.20 (12.02)</td>
<td>69.90 (16.83)</td>
</tr>
<tr>
<td>Achievement (ACH)</td>
<td>68.55 (8.90)</td>
<td>68.70 (7.64)</td>
<td>69.45 (14.98)</td>
</tr>
<tr>
<td>Intellectual Screening (IS)a</td>
<td>84.00 (17.28)</td>
<td>75.65 (20.82)</td>
<td>65.10 (12.87)</td>
</tr>
<tr>
<td>Development (DVL)</td>
<td>69.25 (7.88)</td>
<td>65.75 (7.72)</td>
<td>64.30 (8.87)</td>
</tr>
<tr>
<td>Somatic Concern (SOC)</td>
<td>59.75 (15.67)</td>
<td>59.10 (14.88)</td>
<td>57.35 (12.46)</td>
</tr>
<tr>
<td>Depression (D)</td>
<td>57.10 (10.97)</td>
<td>61.55 (13.77)</td>
<td>63.50 (16.17)</td>
</tr>
<tr>
<td>Family Relations (FAM)</td>
<td>48.80 (8.03)</td>
<td>53.35 (11.69)</td>
<td>54.45 (12.78)</td>
</tr>
<tr>
<td>Delinquency (DLQ)b</td>
<td>56.65 (10.47)</td>
<td>65.35 (10.79)</td>
<td>59.70 (10.17)</td>
</tr>
<tr>
<td>Withdrawal (WDL)</td>
<td>53.20 (11.62)</td>
<td>57.65 (10.36)</td>
<td>56.40 (15.47)</td>
</tr>
<tr>
<td>Anxiety (ANX)</td>
<td>57.55 (9.50)</td>
<td>57.80 (9.73)</td>
<td>61.05 (14.55)</td>
</tr>
<tr>
<td>Psychosis (PSY)</td>
<td>57.05 (10.71)</td>
<td>60.15 (14.80)</td>
<td>60.45 (18.07)</td>
</tr>
<tr>
<td>Hyperactivity (HPR)</td>
<td>54.65 (12.06)</td>
<td>54.15 (12.89)</td>
<td>56.75 (13.47)</td>
</tr>
<tr>
<td>Social Skills (SSK)</td>
<td>56.20 (9.27)</td>
<td>58.55 (10.52)</td>
<td>60.70 (13.31)</td>
</tr>
</tbody>
</table>

(a) Comparison between 8-year-olds and 12-year-olds yields \( p < .01 \)

(b) Comparison between 8-year-olds and 10-year-olds yields \( p < .05 \)
Figure 2

Study 1: Mean PIC Profiles for 8-year-old, 10-year-old, and 12-year-old Learning Disabled Children (n = 20 in each group)
CHAPTER V
DISCUSSION
(STUDY 1)

Heterogeneous groups of learning-disabled children at three age levels were compared on the profile scales of the Personality Inventory for Children (PIC). No clear statistical support was found for the expectation that older learning-disabled children would exhibit more evidence of personality disturbance than would younger learning-disabled children using a fixed-effects model. Even when the PIC clinical profile scale T scores that are thought to be most sensitive to psychopathology were summed in a fashion so as to maximize any differences between the groups (which included 8-year-olds, 10-year-olds, and 12-year-olds), no significant group differences emerged. Given the limitations of this experimental design, this finding does not offer support for the commonly held assumption of Bryan (1979b) and others that the cumulative effects of academic failure may cause older learning-disabled children to be less well-adjusted in their personality functioning than are younger learning-disabled children.

Despite the finding that there were no statistically significant differences between groups on "psychopathology-internalization" and "personality deviance" composite scores, these scores were more elevated for the 10- and, especially, the 12-year-olds. Figure 2 contains a graphic illustration of this point. Furthermore, the
12-year-olds obtained higher mean PIC T score values than did the 8-year-olds on 8 of 9 scales associated with the "personality deviance" composite score. Using Fisher's Exact Test it was determined that the probability of this comparison being due to chance was p < .02. Both 10-year-olds and 12-year-olds obtained higher mean PIC T score values than did the 8-year-olds on all of the five scales associated with the "psychopathology-internalization" composite score. The probability of the 12-year-olds or the 10-year-olds obtaining higher mean PIC T score values than the 8-year-olds on 5 of 5 pre-selected scales was well beyond chance levels, p < .006.

Together, this evidence suggests that there was a trend toward greater concern on the part of the mothers about the personality adjustment of older (10- and 12-year-old) learning disabled children than about younger (8-year-old) learning disabled children. Therefore, some support for Bryan's position was obtained using Fisher's Exact Test.

This "trend" is of interest and may be clinically relevant when considered in conjunction with findings in this study pertaining to the PIC "cognitive development" score. In this regard, it was found that younger (8-year-old) learning disabled children exhibited significantly higher elevations on the "cognitive development" composite score (which includes the Intellectual Screening scale, the Achievement scale, and the Development scale) than did older (12-year-old) learning disabled children. Univariate analyses indicated that the Intellectual Screening scale "contributed" most to the discrepancies between groups on this composite score. Figure 1 illustrates graphically the mothers' concerns about their learning disabled children with respect to the "psychopathology-internalization".
"personality deviance" and the "cognitive development" scores.

It would not be altogether inconsistent with the overall findings in this study to propose that there is some support for the notion that parents (mothers) may view their learning disabled child in a qualitatively different fashion as the child becomes older. It may be the case that, when a learning disabled child is younger (8-years-old), mothers focus their concerns on the intellectual capabilities of their child. Figure 2, in particular, illustrates this point. With older learning disabled children, there would appear to be less concern about the child's intellectual capabilities and more concern about the presence of psychopathology.

When one considers the amount of difficulty that most 8-year-old learning disabled children experience in their attempts to maintain age-appropriate academic achievement, the concerns of mothers about the intellectual capabilities of their learning disabled child are not difficult to understand. At this point in the child's academic career, reading, spelling, and other language-related demands increase significantly. Consequently, a decision is often made at this point by educational authorities to "fail" the child or to refer the child for "special education" because of the child's inability to meet the demands of the regular classroom situation. The latter may serve to extend further the concerns of mothers with respect to the intellectual capabilities and "cognitive development" of their learning-disabled child. Hence, the distinctly elevated Intellectual Screening mean PIC T score for the group of 8-year-old learning disabled children may be a reflection of their most outstanding
"developmental challenges" (e.g., learning to read and spell) and their mothers' perceptions of this situation.

On the other hand, as learning disabled children grow older, both mother and child may become better acquainted with the intellectual limitations of the child. This particular state of affairs may contribute to changes in the child's behavior. A mother, in turn, may then change the focus of her concerns so that they are partially in keeping with changes in the child's behaviour and partially in keeping with renewed behavioural expectations. The qualitative change in the mother's perception of her learning disabled child may then be viewed as an interaction between the child's behavioural experience, his behavioural changes, and the mother's reaction to her child's behaviour.

This formulation might also aid in explaining the Delinquency scale findings. It was found that 10-year-old children had significantly higher elevations on the Delinquency scale than did 8-year-old children. No differences were found between 12-year-old children and 8-year-old children on this scale. Perhaps these findings can be attributed to qualitative changes in behaviour as the learning disabled child grows older and to the mother's perception of these behavioural changes. The fact that 12-year-olds did not exhibit significantly elevated Delinquency T scores suggests that the presence of delinquent behaviours per se were not a general response to the cumulative effects of academic failure for older learning disabled children. In other words, the Delinquency scale findings could be due to an age-specific response rather than to a general
response to the cumulative effects of persistent academic failure.

It is acknowledged that this explanation is proposed on the basis of limited factual information. Questions regarding the presence or absence of qualitative changes in personality development for learning disabled children cannot be addressed directly by a cross-sectional study of this nature. Instead, longitudinal studies of individuals and groups of learning disabled children are needed to investigate further these issues. Moreover, there are rather distinct limitations with respect to the generalization of findings generated from rather heterogeneous groups of learning disabled children to the individual learning disabled child. It may be that subtle individual differences (based perhaps on such factors as learning disability subtype, the child's general developmental history, and/or the nature of the learning disabled child's family structure) are masked because of conflicting behavioural patterns within groups. These issues will require further study.

**STUDY 2**

Study 2 will constitute an initial attempt to evaluate the significance of the learning disabled child's pattern of cognitive strengths and weaknesses for personality status. Differences in the cognitive characteristics of learning disabled children may predispose one group of learning disabled subtype to a greater degree of personality maladjustment. Furthermore, this personality disturbance may tend to take one form rather than another because of the cognitive characteristics of the child. Since it has been fairly
well established that a relationship exists between specific visual-spatial and visual-perceptual deficiencies and some forms of psychosis, the group of children selected to represent this pattern of cognitive abilities is of special interest in Study 2.

Definitions

(a) Personality deviance. This is measured and defined specifically in terms of the T score elevations for the following PIC profile scales: Somatic Concern; Depression; Family Relations; Delinquency; Withdrawal, Anxiety; Psychosis; Hyperactivity; Social Skills.

(b) Psychopathology-Internalization factor. This factor was identified by Lachar (1975) through the factor analysis of 764 PIC profiles of a rather heterogeneous group of children with suspected psychological difficulties. The Psychopathology-Internalization factor includes the following PIC profile scales: Depression; Withdrawal; Anxiety; Social Skills; Psychosis.

(c) Word Knowledge skills. Levels of performance obtained by learning disabled children on the Similarities and Vocabulary subtests of the WISC. These subtests load on Cohen's (1959) Verbal Comprehension Factor A for younger and older children. When viewed together, they have some clinical utility for measuring a learning disabled child's "rote" capacities for language.

(d) Visual-perceptual-organizational skills. Levels of performance obtained by learning disabled children on the Block Design and Object Assembly subtests of the WISC. These subtests load on Cohen's (1959) Perceptual Organization factor (Factor B). This
factor has been identified in the WISC profiles of younger, mid-aged, and older children, as well as in the WAIS profiles of adults.

(e) Group 1: learning disabled children who exhibit a pattern of approximately similar levels of impairment in their word knowledge skills and their visual-perceptual-organizational skills.

(f) Group 2: learning disabled children who exhibit a pattern of better developed visual-perceptual-organizational skills and more poorly developed word knowledge skills.

(g) Group 3: learning disabled children who exhibit a pattern of better developed word knowledge, skills and more poorly developed visual-perceptual-organizational skills.

Expectations

(1) Group 3 children will exhibit more evidence of personality deviance than will Group 2 children.

(2) Group 3 children will exhibit more evidence of personality deviance than will Group 1 children.

(3) Group 3 children will exhibit more evidence of personality disturbance related specifically to the (PIC) Psychopathology-Internalization factor, than will Group 2 children.

(4) Group 3 children will exhibit more evidence of personality disturbance related specifically to the (PIC) Psychopathology-Internalization factor, than will Group 1 children.

(5) For Group 3 children, the PIC Psychosis scale will exhibit the highest T score elevation of all the (PIC) profile scales associated with personality deviance.
CHAPTER VI

METHOD

(STUDY 2)

Subjects

The sample for this study consisted of 60 learning disabled children who were divided into three groups (20 subjects in each group) on the basis of the discrepancy between a composite WISC Similarities subtest and Vocabulary subtest score and a composite WISC Block Design subtest and Object Assembly subtest score. The former is thought to be a measurement of "word-knowledge" skills, while the latter is considered to be a measurement of "visual-perceptual-organizational" skills. The scaled scores from the respective subtests were utilized to form each of these composite scores. The subjects for this study were chosen from over 500 children referred to the Department of Neuropsychology (see above for referral and subject selection criteria), and for whom a PIC had been completed by each subject's mother.

Group 1 children had a "word knowledge score" that was within two scaled score points of their "visual-perceptual-organizational score". It should be noted that the standard error of measurement for the WISC subtest scaled scores ranges from a low of .90 on the
Vocabulary subtest to highs of 1.82 on the Coding subtest and 1.92 on the Digit Span subtest for children included in the normative sample who were 10 1/2 years of age (Wechsler, 1949). Children in Group 2 had a "visual-perceptual-organizational" score that exceeded their "word knowledge score" by at least 5 points. Group 3 children had a "word knowledge score" that exceeded their "visual-perceptual-organizational score" by at least 5 points. The children in this study ranged in age from 8 years, 5 months to 13 years, 9 months and fell within the WISC Full Scale IQ range of 85-113 (see Table 5). Groups were matched for age and WISC Full Scale IQ. Groups were also matched for sex as closely as was possible. There were 4 girls and 16 boys in Group 1 and in Group 2. Six girls and 14 boys were contained in Group 3.

For all subjects in this study, primary emotional disturbance, socio-cultural deprivation, and sensory acuity defects had been ruled out as etiological factors in their poor learning performances. All children had at least one centile score on the Wide Range Achievement Test that was less than or equal to 25. The three groups of children were matched further for mean years of schooling and educational-cultural milieu.

In addition to these group membership selection criteria, each group was formed to contain 10 subjects who were under 10 years of age and 10 subjects who were at least 10 years of age. This particular group feature (two independent within group cells based on age) was introduced to permit a potential cross-validation of Study 1 findings (see Table 6 and Table 7).
TABLE 5
MEANS (STANDARD DEVIATIONS) FOR AGE, WISC FULL SCALE IQ, WISC
VERBAL IQ, WISC PERFORMANCE IQ, WISC "WORD KNOWLEDGE" SCORE,
WISC "VISUAL-PERCEPTUAL-ORGANIZATIONAL" SCORE, AND WRAT
READING, SPELLING, AND ARITHMETIC CENTILE SCORES FOR STUDY 2
SUBJECTS (N = 20 IN EACH GROUP)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (months)</td>
<td>124.75 (19.58)</td>
<td>124.10 (18.07)</td>
<td>124.05 (17.53)</td>
</tr>
<tr>
<td>WISC Full Scale IQ</td>
<td>98.25 (6.50)</td>
<td>98.45 (7.99)</td>
<td>97.45 (5.98)</td>
</tr>
<tr>
<td>WISC Verbal IQ^ab</td>
<td>95.45 (6.99)</td>
<td>88.25 (8.08)</td>
<td>99.60 (6.49)</td>
</tr>
<tr>
<td>WISC Performance IQ^abc</td>
<td>101.85 (7.85)</td>
<td>109.75 (9.02)</td>
<td>95.30 (9.61)</td>
</tr>
<tr>
<td>WISC &quot;Word Knowledge&quot; Score (Similarities + Vocabulary)^abcd</td>
<td>21.05 (2.50)</td>
<td>18.40 (2.99)</td>
<td>25.00 (2.15)</td>
</tr>
<tr>
<td>WISC &quot;Visual-Perceptual-Organizational&quot; Score (Block Design + Object Assembly)^abcd</td>
<td>21.50 (3.10)</td>
<td>25.60 (2.54)</td>
<td>17.05 (3.11)</td>
</tr>
<tr>
<td>WRAT Reading (Centile)^bcd</td>
<td>18.75 (15.30)</td>
<td>18.40 (13.91)</td>
<td>49.35 (31.66)</td>
</tr>
<tr>
<td>WRAT Spelling (Centile)^bcd</td>
<td>12.90 (8.19)</td>
<td>13.25 (8.47)</td>
<td>34.00 (24.04)</td>
</tr>
<tr>
<td>WRAT Arithmetic (Centile)</td>
<td>18.60 (15.85)</td>
<td>21.15 (13.09)</td>
<td>17.85 (9.53)</td>
</tr>
</tbody>
</table>

(a) Comparison between Group 1 and Group 2 yields \( p < .01 \)
(b) Comparison between Group 2 and Group 3 yields \( p < .01 \)
(c) Comparison between Group 1 and Group 3 yields \( p < .05 \)
(d) Comparison between Group 1 and Group 3 yields \( p < .01 \)
TABLE 6
MEANS (STANDARD DEVIATIONS) FOR AGE, WISC FULL SCALE IQ, WISC VERBAL IQ, WISC PERFORMANCE IQ, WISC "WORD KNOWLEDGE" SCORE, WISC "VISUAL-PERCEPTUAL-ORGANIZATIONAL" SCORE, AND WRAT READING, SPELLING AND ARITHMETIC CENTILE SCORES FOR YOUNGER AND OLDER GROUP 2 SUBJECTS (N = 30 IN EACH GROUP)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Younger</th>
<th>Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (months)(^a)</td>
<td>109.63 (5.00)</td>
<td>138.96 (14.03)</td>
</tr>
<tr>
<td>WISC Full Scale IQ(^b)</td>
<td>100.23 (6.26)</td>
<td>95.86 (6.65)</td>
</tr>
<tr>
<td>WISC Verbal IQ(^b)</td>
<td>96.33 (8.59)</td>
<td>92.53 (8.16)</td>
</tr>
<tr>
<td>WISC Performance IQ(^b)</td>
<td>104.50 (11.57)</td>
<td>100.10 (9.09)</td>
</tr>
<tr>
<td>WISC &quot;Word Knowledge&quot; Score (Similarities + Vocabulary)(^a)</td>
<td>22.33 (3.70)</td>
<td>20.63 (3.60)</td>
</tr>
<tr>
<td>WISC &quot;Visual-Perceptual-Organizational&quot; Score (Block Design + Object Assembly)(^a)</td>
<td>22.30 (4.73)</td>
<td>20.46 (4.24)</td>
</tr>
<tr>
<td>WRAT Reading (Centile)</td>
<td>27.40 (25.90)</td>
<td>30.26 (26.40)</td>
</tr>
<tr>
<td>WRAT Spelling (Centile)</td>
<td>21.46 (16.92)</td>
<td>18.63 (19.50)</td>
</tr>
<tr>
<td>WRAT Arithmetic (Centile)(^a)</td>
<td>26.40 (11.40)</td>
<td>12.00 (10.17)</td>
</tr>
</tbody>
</table>

(a) Comparison between Younger and Older yields \(p < .01\)
(b) Comparison between Younger and Older yields \(p < .05\)
<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1 Younger</th>
<th>Group 1 Older</th>
<th>Group 2 Younger</th>
<th>Group 2 Older</th>
<th>Group 3 Younger</th>
<th>Group 3 Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (months)</td>
<td>109.20</td>
<td>140.30</td>
<td>109.90</td>
<td>138.30</td>
<td>109.80</td>
<td>138.30</td>
</tr>
<tr>
<td>WISC Full Scale IQ</td>
<td>102.00</td>
<td>94.50</td>
<td>100.60</td>
<td>96.30</td>
<td>98.10</td>
<td>96.80</td>
</tr>
<tr>
<td>WISC Verbal IQ</td>
<td>98.20</td>
<td>92.70</td>
<td>88.90</td>
<td>87.60</td>
<td>101.90</td>
<td>97.30</td>
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<tr>
<td>WISC Performance IQ</td>
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<td>97.80</td>
<td>113.40</td>
<td>106.10</td>
<td>94.20</td>
<td>96.40</td>
</tr>
<tr>
<td>WISC &quot;Word Knowledge&quot; Score (Similarities + Vocabulary)</td>
<td>24.40</td>
<td>19.70</td>
<td>19.10</td>
<td>17.70</td>
<td>25.50</td>
<td>24.50</td>
</tr>
<tr>
<td>WISC &quot;Visual-Perceptual-Organizational&quot; Score (Block Design + Object Assembly)</td>
<td>23.70</td>
<td>19.30</td>
<td>26.10</td>
<td>25.10</td>
<td>17.10</td>
<td>17.00</td>
</tr>
<tr>
<td>WRAT Reading (Centile)</td>
<td>20.00</td>
<td>17.50</td>
<td>16.60</td>
<td>20.20</td>
<td>45.60</td>
<td>53.10</td>
</tr>
<tr>
<td>WRAT Spelling (Centile)</td>
<td>16.30</td>
<td>9.50</td>
<td>16.60</td>
<td>9.90</td>
<td>31.50</td>
<td>36.50</td>
</tr>
<tr>
<td>WRAT Arithmetic (Centile)</td>
<td>28.60</td>
<td>8.60</td>
<td>28.40</td>
<td>13.90</td>
<td>22.20</td>
<td>13.50</td>
</tr>
</tbody>
</table>
Test Measures

The dependent measures for this study included the 16 profile scales of the Personality Inventory for Children. Definitely atypical response sets were eliminated from the initial subject pools from which each group was formed (see Study 1 for a description of this procedure).
CHAPTER VII

RESULTS

(STUDY 2)

First, "cognitive development", "psychopathology-internalization" and "personality deviance" composite scores were computed for each subject (see Study I for a description and rationale for these composite scores). These three composite scores constituted the dependent measures for a two-way analysis of variance (Group X Age) to test for significant differences between the three groups. The following differences which approached commonly accepted levels of statistical significance were in evidence for Factor A (Groups):

"psychopathology-internalization" yielded $F(2, 54) = 2.29, p < .11$; and, "personality deviance" yielded $F(2, 54) = 2.37, p < .10$.

Planned comparisons were employed to test differences between group means for both variables since these comparisons addressed directly specific a priori hypotheses. For the "psychopathology-internalization" measure Group 3 children exhibited higher PIC T scores than did Group 2 children $(p < .05)$. Similar results were obtained on the "personality deviance" variable. The scores of Group 3 children exceeded those of Group 2 children $(p < .05)$. Group means, standard deviations, and the results of these planned comparisons are presented in Table 8. Figure 3 illustrates graphically the relationship between
TABLE 8
MEANS (STANDARD DEVIATIONS) FOR COGNITIVE DEVELOPMENT,
PSYCHOPATHOLOGY-INTERNALIZATION AND PERSONALITY DEVIANCE SCORES
FOR STUDY 2 SUBJECTS (N = 20 IN EACH GROUP)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Development Score (ACH + IS + DVL)</td>
<td>217.60 (28.78)</td>
<td>205.45 (31.95)</td>
<td>211.45 (37.34)</td>
</tr>
<tr>
<td>Psychopathology-Internalization Score (D+ WDL + ANX + PSY + SSK)</td>
<td>293.60 (41.19)</td>
<td>280.00 (43.65)</td>
<td>311.40 (50.56)</td>
</tr>
<tr>
<td>Personality Deviance Score (SQM + D + FAM + DLQ + WDL + ANX + PSY + HPR + SSK)</td>
<td>511.75 (65.65)</td>
<td>500.60 (63.91)</td>
<td>543.60 (59.81)</td>
</tr>
</tbody>
</table>

Comparison between Group 2 and Group 3 yields $p < .05$
Figure 3

Study 2: Mean PIC Cognitive Development, Psychopathology-Internalization and Personality Deviance Scores (n = 20 in each group).
groups on these composite scores.

Fisher's Exact Test was employed to evaluate further comparisons between Group 3 and Group 1 children and comparisons between Group 3 and Group 2 children on the composite score measures. On the "personality deviance" score Group 3 children obtained higher mean PIC T score values than did Group 2 children on eight of the nine scales. The probability of this result being due to chance was $p < .02$. Group 3 children obtained higher mean PIC T score values than did Group 1 children on all nine of the scales associated with "personality deviance." The probability of this result being due to chance was $p < .0001$. On the "psychopathology-internalization" composite score Group 3 children obtained higher mean PIC T score values than did Group 2 and Group 1 children on all five scales associated with this measure. The probability of either one of these comparisons being due to chance was $p < .006$.

No differences were in evidence for factor B (Age) and there were no statistically significant (A x B) interactions.

All PIC profile scales were then compared for the three groups by means of a two-way multivariate analysis of variance (Group X Age). The means and standard deviations for the PIC profile scales (for Factor A - Groups) are presented in Table 9. The MANOVA failed to yield a root that was significant beyond the .05 level. The Hotelling-Lawley Trace, Pillai's Trace, and Wilk's Criterion were computed. Univariate $F$ tests yielded significant group differences for two variables: Adjustment, $F(2, 54) = 3.10, p < .05$; and, Psychosis, $F(2, 54) = 3.44, p < .03$. Comparisons between means using the
<table>
<thead>
<tr>
<th>PIC Scale</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lie (L)</td>
<td>50.00 (9.18)</td>
<td>49.20 (10.60)</td>
<td>44.75 (10.35)</td>
</tr>
<tr>
<td>F (F)</td>
<td>58.05 (13.75)</td>
<td>56.30 (11.47)</td>
<td>64.05 (13.29)</td>
</tr>
<tr>
<td>Defensiveness (DEF)</td>
<td>49.15 (13.20)</td>
<td>44.20 (10.66)</td>
<td>43.60 (9.12)</td>
</tr>
<tr>
<td>Adjustment (ADJ)</td>
<td>68.85 (13.01)</td>
<td>65.00 (10.62)</td>
<td>75.05 (14.01)</td>
</tr>
<tr>
<td>Achievement (ACH)</td>
<td>69.90 (6.21)</td>
<td>66.90 (8.58)</td>
<td>65.90 (8.25)</td>
</tr>
<tr>
<td>Intellectual</td>
<td>81.05 (16.24)</td>
<td>74.35 (18.72)</td>
<td>79.85 (26.26)</td>
</tr>
<tr>
<td>Screening (IS)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development (DVL)</td>
<td>66.45 (9.67)</td>
<td>64.20 (9.51)</td>
<td>65.70 (10.43)</td>
</tr>
<tr>
<td>Somatic Concern (SOM)</td>
<td>59.20 (17.42)</td>
<td>55.05 (12.63)</td>
<td>61.55 (12.33)</td>
</tr>
<tr>
<td>Depression (D)</td>
<td>61.55 (10.93)</td>
<td>57.40 (11.65)</td>
<td>64.05 (13.32)</td>
</tr>
<tr>
<td>Family Relations (FAM)</td>
<td>50.60 (9.67)</td>
<td>55.00 (12.99)</td>
<td>54.05 (12.37)</td>
</tr>
<tr>
<td>Delinquency (DLQ)</td>
<td>58.55 (12.41)</td>
<td>56.50 (6.30)</td>
<td>59.20 (9.13)</td>
</tr>
<tr>
<td>Withdrawal (WDL)</td>
<td>54.70 (10.38)</td>
<td>55.95 (10.79)</td>
<td>56.20 (7.31)</td>
</tr>
<tr>
<td>Anxiety (ANX)</td>
<td>58.60 (10.21)</td>
<td>56.30 (10.88)</td>
<td>61.60 (13.39)</td>
</tr>
<tr>
<td>Psychosis (PSY) a</td>
<td>61.00 (11.92)</td>
<td>55.00 (11.94)</td>
<td>67.10 (17.96)</td>
</tr>
<tr>
<td>Hyperactivity (HPR)</td>
<td>52.75 (14.03)</td>
<td>54.05 (11.32)</td>
<td>55.25 (14.71)</td>
</tr>
<tr>
<td>Social Skills (SSK)</td>
<td>57.75 (8.20)</td>
<td>55.35 (11.15)</td>
<td>62.45 (12.47)</td>
</tr>
</tbody>
</table>

(a) Comparison between Group 2 and Group 3 yields p < .05
Newman-Keuls procedure are presented in Table 9. For the Adjustment scale, there were higher T score elevations for Group 3 children than for Group 2 children, (p < .05). A similar pattern of results was obtained on the Psychosis scale with Group 3 children exhibiting higher T score elevations than Group 2 children (p < .05). Figure 4 presents a graphic illustration of mean PIC profile scale group differences.

The mean and standard deviations for the PIC profile scales (for Factor B - Age) are presented in Table 10. The MANOVA failed to yield a root that was significant beyond the .05 level. The Hotelling-Lawley Trace, Pillai's Trace, and Wilk's Criterion were computed.

Univariate F tests were computed for each variable. None of these comparisons approached meaningful levels of statistical significance. Table 10 and Figure 5 illustrate the similarities between Younger (8- and 9-year-olds) and Older (10-, 11-, 12-, and 13-year-olds) children in this study.

Means for the PIC profile scales for Younger and Older Group 1, Group 2, Group 3 children are presented in Table 11. While the MANOVA failed to yield a root (Hotelling-Lawley Trace, Pillai's Trace, or Wilk's Criterion) that was significant beyond the .05 level for these (A X B) interactions, the results of two univariate F tests were of interest. The interactions for the PIC Achievement variable yielded F (2, 54) = 2.84, p < .06. The interaction for the PIC Development variable yielded F (2, 54) = 3.03, p < .05. The mean scores for both sets of comparisons have been illustrated graphically in Figure 6.
Figure 4

Study 2: Mean PIC Profiles for Group 1, Group 2, and Group 3 Learning Disabled Children (n = 20 in each group)
### TABLE 10

**Means (Standard Deviations) for PIC Profile Scales**

For Younger and Older Study 2 Subjects (N = 30 in Each Group)

<table>
<thead>
<tr>
<th>PIC Scale</th>
<th>Younger</th>
<th>Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lie (L)</td>
<td>47.63 (9.49)</td>
<td>48.33 (10.94)</td>
</tr>
<tr>
<td>F (P)</td>
<td>60.83 (15.05)</td>
<td>58.10 (10.87)</td>
</tr>
<tr>
<td>Defensiveness (DEF)</td>
<td>43.56 (9.36)</td>
<td>47.73 (12.62)</td>
</tr>
<tr>
<td>Adjustment (ADJ)</td>
<td>68.60 (12.47)</td>
<td>70.66 (13.82)</td>
</tr>
<tr>
<td>Achievement (ACH)</td>
<td>68.53 (7.42)</td>
<td>66.60 (8.18)</td>
</tr>
<tr>
<td>Intellectual Screening (IS)</td>
<td>80.66 (18.96)</td>
<td>76.16 (22.40)</td>
</tr>
<tr>
<td>Developmental (DVL)</td>
<td>66.36 (11.16)</td>
<td>64.53 (8.20)</td>
</tr>
<tr>
<td>Somatic Concern (SCM)</td>
<td>58.33 (16.44)</td>
<td>58.86 (12.15)</td>
</tr>
<tr>
<td>Depression (D)</td>
<td>60.03 (11.56)</td>
<td>61.96 (12.78)</td>
</tr>
<tr>
<td>Family Relations (FAM)</td>
<td>53.46 (13.36)</td>
<td>52.96 (10.04)</td>
</tr>
<tr>
<td>Delinquency (DLQ)</td>
<td>56.70 (8.00)</td>
<td>59.46 (10.78)</td>
</tr>
<tr>
<td>Withdrawal (WDL)</td>
<td>55.36 (10.84)</td>
<td>55.86 (8.06)</td>
</tr>
<tr>
<td>Anxiety (ANX)</td>
<td>58.66 (11.35)</td>
<td>59.00 (11.93)</td>
</tr>
<tr>
<td>Psychosis (PSY)</td>
<td>61.73 (14.35)</td>
<td>60.33 (15.53)</td>
</tr>
<tr>
<td>Hyperactivity (HPR)</td>
<td>54.30 (13.80)</td>
<td>53.73 (12.90)</td>
</tr>
<tr>
<td>Social Skills (SSK)</td>
<td>58.13 (11.51)</td>
<td>58.90 (10.60)</td>
</tr>
</tbody>
</table>
Figure 5

Study 2: Mean PIC Profiles for Younger and Older Learning Disabled Children (n = 30 in each group)
<table>
<thead>
<tr>
<th>PIC Scale</th>
<th>Group 1 Younger</th>
<th>Group 1 Older</th>
<th>Group 2 Younger</th>
<th>Group 2 Older</th>
<th>Group 3 Younger</th>
<th>Group 3 Older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lie (L)</td>
<td>48.70</td>
<td>51.30</td>
<td>50.69</td>
<td>47.90</td>
<td>43.70</td>
<td>45.80</td>
</tr>
<tr>
<td>F (F)</td>
<td>57.80</td>
<td>58.30</td>
<td>56.30</td>
<td>56.30</td>
<td>68.40</td>
<td>59.70</td>
</tr>
<tr>
<td>Defensiveness (DEF)</td>
<td>47.30</td>
<td>51.00</td>
<td>41.40</td>
<td>47.00</td>
<td>42.00</td>
<td>45.20</td>
</tr>
<tr>
<td>Adjustment (ADJ)</td>
<td>66.30</td>
<td>71.40</td>
<td>65.30</td>
<td>64.70</td>
<td>74.20</td>
<td>75.90</td>
</tr>
<tr>
<td>Achievement (ACH)</td>
<td>67.60</td>
<td>72.20</td>
<td>69.60</td>
<td>64.20</td>
<td>68.40</td>
<td>63.40</td>
</tr>
<tr>
<td>Intellectual Screening (IS)</td>
<td>80.00</td>
<td>82.10</td>
<td>79.00</td>
<td>69.70</td>
<td>83.00</td>
<td>76.70</td>
</tr>
<tr>
<td>Development (DVL)</td>
<td>63.50</td>
<td>69.40</td>
<td>65.40</td>
<td>63.00</td>
<td>70.20</td>
<td>61.20</td>
</tr>
<tr>
<td>Somatic Concern (SOM)</td>
<td>58.50</td>
<td>59.90</td>
<td>52.30</td>
<td>57.80</td>
<td>64.20</td>
<td>58.90</td>
</tr>
<tr>
<td>Depression (D)</td>
<td>61.90</td>
<td>61.20</td>
<td>56.90</td>
<td>57.90</td>
<td>61.30</td>
<td>66.80</td>
</tr>
<tr>
<td>Family Relations (FAM)</td>
<td>52.80</td>
<td>48.40</td>
<td>54.50</td>
<td>55.50</td>
<td>53.10</td>
<td>55.00</td>
</tr>
<tr>
<td>Delinquency (DLQ)</td>
<td>55.10</td>
<td>62.00</td>
<td>57.00</td>
<td>56.00</td>
<td>58.00</td>
<td>60.40</td>
</tr>
<tr>
<td>Withdrawal (WDL)</td>
<td>54.50</td>
<td>54.90</td>
<td>56.70</td>
<td>55.20</td>
<td>54.90</td>
<td>57.50</td>
</tr>
<tr>
<td>Anxiety (ANX)</td>
<td>58.30</td>
<td>58.90</td>
<td>55.60</td>
<td>57.00</td>
<td>62.10</td>
<td>61.10</td>
</tr>
<tr>
<td>Psychosis (PSY)</td>
<td>62.20</td>
<td>59.80</td>
<td>54.70</td>
<td>55.30</td>
<td>68.30</td>
<td>65.90</td>
</tr>
<tr>
<td>Hyperactivity (HPR)</td>
<td>52.20</td>
<td>53.30</td>
<td>55.50</td>
<td>52.60</td>
<td>55.20</td>
<td>55.30</td>
</tr>
<tr>
<td>Social Skills (SSK)</td>
<td>56.10</td>
<td>59.40</td>
<td>55.20</td>
<td>55.50</td>
<td>63.10</td>
<td>61.80</td>
</tr>
</tbody>
</table>
Figure 6

Study 2: Mean PIC Achievement and Development Scales for Younger and Older Group 1, Group 2, and Group 3 Subjects (n = 10 in each group)
Following these analyses, three new groups were formed to maximize the separation between Group 3 children and Group 2 children with respect to their scores on the independent "word knowledge" and "visual-perceptual-organizational" measures. A second purpose of this procedure was to increase the homogeneity of Group 3 children in terms of their patterns of PIC clinical scale scores. A visual scanning of the data including both dependent and independent measures suggested that discrepancy of greater than or equal to 8 points between the "word-knowledge" score and "visual-perceptual-organizational" score for Group 3 children served best for both of these purposes.

There were eight Group 3 children with a discrepancy of greater than or equal to 8 points between their "word-knowledge" score and "visual-perceptual-organizational" score. Ten Group 2 children met with this initial selection criteria. In order to match these Group 3 and Group 2 children with Group 1 children for age, sex, and WISC Full Scale IQ and maintain an equal number of subjects (n) in each group, it was necessary to reduce the groups to 7 members (n = 7). Table 12 contains means and standard deviations for the independent and other descriptive variables for the (n = 7) Group 1, Group 2 and Group 3 children. There were 3 girls and 4 boys in each group.

The results of a one-way analysis of variance for the composite "cognitive development", "psychopathology-internalization" and "personality deviance" scores yielded significant group differences on the "psychopathology-internalization" measure $F(2, 18) = 3.61$, $p < .04$. Planned comparisons were employed to test differences between group means for the "psychopathology-internalization" and
TABLE 12
MEANS (STANDARD DEVIATIONS) FOR AGE, WISC FULL SCALE IQ, WISC VERBAL IQ, WISC PERFORMANCE IQ, WISC "WORD KNOWLEDGE" SCORE, WISC "VISUAL-PERCEPTUAL-ORGANIZATIONAL" SCORE, AND WRAT READING, SPELLING, AND ARITHMETIC CENTILE SCORES FOR STUDY-2 SUBJECTS
(N = 7 IN EACH GROUP)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (months)</td>
<td>123.85 (14.38)</td>
<td>127.28 (20.85)</td>
<td>121.85 (18.70)</td>
</tr>
<tr>
<td>WISC Full Scale IQ</td>
<td>95.71 (5.46)</td>
<td>98.00 (10.64)</td>
<td>95.85 (8.00)</td>
</tr>
<tr>
<td>WISC Verbal IQ&lt;sup&gt;a&lt;/sup&gt;b</td>
<td>93.00 (5.53)</td>
<td>87.00 (10.03)</td>
<td>103.00 (6.19)</td>
</tr>
<tr>
<td>WISC Performance&lt;sup&gt;a&lt;/sup&gt;</td>
<td>99.85 (5.72)</td>
<td>110.28 (10.24)</td>
<td>88.71 (11.23)</td>
</tr>
<tr>
<td>WISC &quot;Word Knowledge&quot; Score (Similarities + Vocabulary)&lt;sup&gt;a&lt;/sup&gt;c&lt;sup&gt;d&lt;/sup&gt;</td>
<td>20.71 (2.69)</td>
<td>17.14 (3.33)</td>
<td>25.57 (2.22)</td>
</tr>
<tr>
<td>WISC &quot;Visual-Perceptual-Organizational&quot; Score (Block Design + Object Assembly)&lt;sup&gt;a&lt;/sup&gt;c&lt;sup&gt;e&lt;/sup&gt;</td>
<td>20.57 (3.35)</td>
<td>25.57 (2.87)</td>
<td>15.00 (3.26)</td>
</tr>
<tr>
<td>WRAT Reading (Centile)&lt;sup&gt;a&lt;/sup&gt;c</td>
<td>15.42 (-9.03)</td>
<td>21.57 (16.66)</td>
<td>71.71 (28.64)</td>
</tr>
<tr>
<td>WRAT Spelling (Centile)&lt;sup&gt;a&lt;/sup&gt;c</td>
<td>13.28 (9.28)</td>
<td>12.71 (5.08)</td>
<td>45.71 (26.68)</td>
</tr>
<tr>
<td>WRAT Arithmetic (Centile)</td>
<td>15.42 (4.31)</td>
<td>20.42 (12.28)</td>
<td>21.85 (11.36)</td>
</tr>
</tbody>
</table>

(a) Comparison between Group 2 and Group 3 yields p < .01
(b) Comparison between Group 1 and Group 3 yields p < .05
(c) Comparison between Group 1 and Group 3 yields p < .01
(d) Comparison between Group 1 and Group 2 yields p < .05
(e) Comparison between Group 1 and Group 2 yields p < .01
"personality deviance" variables, since these comparisons addressed
directly specific a priori hypotheses. Significant group differences
were obtained on the "psychopathology-internalization" measure only.
Group 3 children exhibited higher combined PIC T scores when compared
with Group 2 children (p < .05), and when compared with Group 1,
children (p < .05). Group means, standard deviations, and the
results of these planned comparisons are presented in Table 13.
Figure 7 illustrates graphically the relationship between groups on
these composite scores.

The means and standard deviations for the PIC profile scales
for (n = 7) Group 1, Group 2, and Group 3 are presented in Table 14.
The results of a one-way analysis of variance yielded group diffe-
rences on the PIC Psychosis scale F (2, 18) = 6.38, p < .008. Com-
parisons between group means using the Newman-Keuls procedure are also
presented in Table 14. These comparisons revealed higher PIC
Psychosis T score elevations for Group 3 vs. Group 2 children (p < .01)
and a similar pattern of results for Group 3 vs. Group 1 children
(p < .05). Figure 8 presents a graphic illustration of mean PIC
profile scale group differences.
### TABLE 13

**MEANS (STANDARD DEVIATIONS) FOR COGNITIVE DEVELOPMENT, PSYCHOPATHOLOGY-INTERNALIZATION AND PERSONALITY DEVIANCE SCORES FOR STUDY 2 SUBJECTS (N = 7 IN EACH GROUP)**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Development Score</td>
<td>232.28 (23.94)</td>
<td>216.42 (30.47)</td>
<td>222.00 (26.38)</td>
</tr>
<tr>
<td>(ACH + IS + DVL)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychopathology</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalization Score (D + WDL +</td>
<td>274.28 (34.84)</td>
<td>271.57 (50.36)</td>
<td>320.57 (25.81)</td>
</tr>
<tr>
<td>ANX + PSY + SSK) ab</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personality Deviance Score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score (SQM + D + FAM + DLQ + WDL + ANX + PSY + HFR + SSK)</td>
<td>485.28 (51.34)</td>
<td>490.57 (62.15)</td>
<td>540.14 (46.08)</td>
</tr>
</tbody>
</table>

(a) Comparison between Group 2 and Group 3 yields p < .05
(b) Comparison between Group 1 and Group 3 yields p < .05
Study 2: Mean PIC Cognitive Development, Psychopathology-Internalization and Personality Deviance Scores (n = 7 in each group).
### TABLE 14

**MEANS (STANDARD DEVIATIONS) FOR PIC PROFILE SCALES FOR STUDY SUBJECTS (N = 7 IN EACH GROUP)**

<table>
<thead>
<tr>
<th>PIC Scale</th>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lie (L)</td>
<td>51.14 (12.95)</td>
<td>53.28 (8.36)</td>
<td>46.14 (11.62)</td>
</tr>
<tr>
<td>F (F)</td>
<td>57.42 (7.87)</td>
<td>57.85 (13.24)</td>
<td>70.00 (13.25)</td>
</tr>
<tr>
<td>Defensiveness (DEF)</td>
<td>53.57 (13.98)</td>
<td>44.14 (13.54)</td>
<td>44.71 (13.90)</td>
</tr>
<tr>
<td>Adjustment (ADJ)</td>
<td>68.00 (12.60)</td>
<td>63.00 (9.74)</td>
<td>70.28 (17.07)</td>
</tr>
<tr>
<td>Achievement (ACH)</td>
<td>74.14 (4.45)</td>
<td>69.14 (7.05)</td>
<td>67.57 (9.30)</td>
</tr>
<tr>
<td>Intellectual Screening (IS)</td>
<td>87.42 (15.89)</td>
<td>81.14 (17.83)</td>
<td>83.57 (24.08)</td>
</tr>
<tr>
<td>Developmental (DVL)</td>
<td>70.17 (9.06)</td>
<td>66.14 (6.38)</td>
<td>70.85 (8.93)</td>
</tr>
<tr>
<td>Somatic Concern (SCM)</td>
<td>54.42 (11.05)</td>
<td>59.85 (13.18)</td>
<td>57.57 (15.97)</td>
</tr>
<tr>
<td>Depression (D)</td>
<td>54.28 (8.32)</td>
<td>55.57 (13.89)</td>
<td>62.00 (8.28)</td>
</tr>
<tr>
<td>Family Relations (FAM)</td>
<td>49.42 (7.91)</td>
<td>50.71 (5.49)</td>
<td>51.85 (9.35)</td>
</tr>
<tr>
<td>Delinquency (DLQ)</td>
<td>62.28 (9.99)</td>
<td>57.85 (4.81)</td>
<td>55.71 (9.65)</td>
</tr>
<tr>
<td>Withdrawal (WDL)</td>
<td>50.28 (6.31)</td>
<td>57.14 (14.54)</td>
<td>59.42 (7.25)</td>
</tr>
<tr>
<td>Anxiety (ANX)</td>
<td>55.14 (10.68)</td>
<td>49.28 (6.52)</td>
<td>58.57 (8.92)</td>
</tr>
<tr>
<td>Psychosis (PSY)ab</td>
<td>58.85 (13.90)</td>
<td>51.71 (8.34)</td>
<td>76.42 (16.42)</td>
</tr>
<tr>
<td>Hyperactivity (HPR)</td>
<td>53.28 (12.72)</td>
<td>50.57 (5.38)</td>
<td>54.42 (20.43)</td>
</tr>
<tr>
<td>Social Skills (SSK)</td>
<td>55.71 (3.68)</td>
<td>57.85 (11.52)</td>
<td>64.14 (12.13)</td>
</tr>
</tbody>
</table>

(a) Comparison between Group 2 and Group 3 yields $p < .01$

(b) Comparison between Group 1 and Group 3 yields $p < .05$
Figure 8

Study 2: Mean PIC Profiles for Group 1, Group 2, and Group 3 Learning Disabled Children (n = 7 in each group)

PIC Scale
CHAPTER VIII
DISCUSSION
(STUDY 2)

This chapter begins with a summarized evaluation of the expectations for this study. A more detailed discussion of the cognitive and PIC characteristics of Group 3 children follows. The cognitive and PIC characteristics of Group 2 children and Group 1 children are then considered in succeeding sections of this chapter. Separate sections dealing with (a) mean PIC profile comparisons of "older" and "younger" Group 1, Group 2, and Group 3 children, (b) the clinical and research utility of the Personality Inventory for Children with learning disabled children, and (c) future research and clinical considerations pertaining to Group 3 children are also presented in this discussion.

Evaluation of Expectations

(1) It was expected that Group 3 children would exhibit more evidence of "personality deviance" than would Group 2 children. Statistically significant differences between the two groups on the "personality deviance" composite score confirmed this expectation.

(2) Group 3 children were expected to exhibit more evidence of "personality deviance" than were Group 1 children. Group comparisons were not found to be statistically significant on this
measure. However, Group 3 children obtained higher mean PIC T score values on all nine of the scales associated with "personality deviance." Using Fisher's Exact Test, it was determined that the probability of this result being due to chance was $p < .0001$.

(3) Group 3 children were expected to exhibit more evidence of personality disturbance related specifically to the (PIC) Psychopathology-Internalization factor than were Group 2 children. This expectation was confirmed. Univariate analyses indicated that the PIC Psychosis scale findings contributed most to group differences found on the "psychopathology-internalization" measure.

(4) It was expected that Group 3 children would exhibit more evidence of personality disturbance related specifically to the (PIC) Psychopathology-Internalization factor than would Group 1 children. Group differences were not found to be statistically significant on the composite score that was employed to represent this factor. However, Group 3 children obtained higher mean PIC T score values on all five of the scales associated with the "psychopathology-internalization measure." Using Fisher's Exact Test, it was determined that the probability of this result being due to chance was $p < .006$.

(5) It was expected that the PIC Psychosis scale would exhibit the highest T score elevation of all of the (PIC) profile scales associated with "personality deviance" for Group 3 children. This expectation received clear support from the results of this study.
Characteristics of Group 3 Children

Group 3 children were of primary interest in this study. Every child in this group exhibited a pattern of well-developed "word-knowledge" skills and more poorly developed "visual-spatial-organizational" skills. The exceptionally good performances exhibited by Group 3 children on the WISC Similarities and Vocabulary subtests are thought to be an adequate reflection of their most salient information processing strengths. Knowledge of common word associations and a general store of information concerning word usage are well-developed for these youngsters. On the other hand, the deficiencies of Group 3 children are thought to extend well beyond their poor puzzle construction abilities (WISC Object Assembly subtest) and difficulties with the completion of specific visual-spatial designs with blocks (WISC Block Design subtest). There is good reason to believe that many children in this group would perform poorly relative to their age-mates on many other measures of "non-verbal" information processing abilities (Rourke & Finlayson, 1978; Rourke & Strang, 1978).

A visual scanning of the mean PIC profiles for Group 1, Group 2, and Group 3 children in Figure 4 suggests that Group 3 children are most "at risk" with respect to psychopathology. Somewhat prominent "peaks" on the PIC Psychosis, Depression, Social Skills, Adjustment, and F scales characterize best the differences between Group 3 children and the other two groups. However, univariate analyses revealed only significant differences between Group 3 and Group 2 children on the PIC Adjustment and Psychosis scales (there exists
a moderate correlation of .51 between the PIC Adjustment and Psychosis scales). Undoubtedly, the PIC Psychosis scale results "contributed" most to the statistically significant differences found between Group 3 children and Group 2 children on the "personality deviance" and "psychopathology-internalization" composite score measures.

The visual configuration obtained for the mean PIC profile for Group 3 children is quite similar to that obtained for Subtype 2 children in the Porter (1980) study. This particular mean PIC profile pattern suggests that many Group 3 children may have a tendency towards internalizing psychological conflicts and be seen as somewhat depressive, anxious, uncomfortable, and socially maladaptive. An analysis of items from the PIC Psychosis scale, which is especially elevated for Group 3 children, reveals item categories which include the following: (1) isolation from peers and/or peer rejection; (2) a lack of self-help skills; (3) the presence of inappropriate affect and/or disorientation; and, (4) a lack of judgment. An item analysis of the PIC Psychosis scale can be found in Appendix A. Although the mean PIC Psychosis scale T score elevation for Group 3 children could be considered to be only moderate at best, it would be essentially in keeping with these test results to suggest that Group 3 children exhibit (or are perceived by their mothers as exhibiting) behaviours that are not typical of the "average" child.

When the degree of discrepancy between "word-knowledge" skills and "visual-perceptual-organizational" skills was increased from a
minimum of 5 points to a minimum of 8 points (causing a reduction of subjects in Group 3 from 20 to 7), the mean PIC Psychosis scale became more elevated. Figure 8 illustrates the distinctly elevated PIC Psychosis scale for Group 3 children which approximated the 75 T score range. The clinical significance of this particular T score elevation on the PIC Psychosis scale is not well understood at this point (Wirt, Lachar, Klinedinst, & Seat, 1977), although it is certainly noteworthy, particularly in relation to the rather normal PIC Psychosis scale elevations obtained by Group 2 and Group 3 children.

Perhaps, the most interesting and reliable finding concerning the n = 7 procedure completed in Study 2 was that Group 3 children became more homogeneous with respect to general elevations on the "psychopathology-internalization" measure. The relatively small standard deviation (25.81) for Group 3 (n = 7) children on the "psychopathology-internalization" measure as presented in Table 13 illustrates this point. This apparent reduction in the heterogeneity of Group 3 children suggests that even more dramatic differences between groups could be demonstrated on the "psychopathology-internalization" measure by increasing the number of subjects with a "word-knowledge" skill score and "visual-perceptual-organizational" skill score discrepancy of at least 8 points. It also suggests that a direct relationship may exist between the degree of specific impairment in visual-perceptual and visual-spatial skills and the predisposition towards the development of atypical (unusual) behavioural patterns in childhood.
Characteristics of Group 2 Children

There is little doubt that the language impairment of Group 2 children extends well beyond their poor performances on the WISC Vocabulary and Similarities subtests (Rourke & Finlayson, 1978; Rourke & Strang, 1978). By the same token, it is quite likely that most Group 2 children have a number of very well-developed "non-verbal" abilities.

One does not have to venture far into the "learning disability" literature to obtain descriptions of children who are quite similar to those subjects in Group 2. In fact, the majority of children with disorders of learning exhibit somewhat impaired linguistic skills and better developed visual-perceptual and visual-spatial skills. The very impaired mean WRAT centile scores for Reading, Spelling and Arithmetic subtests underscore the extent of academic underachievement for Group 2 children. Table 5 contains these and other descriptive statistics.

Whether there was a minimal discrepancy of five points or a more significant discrepancy of eight points between better developed "visual-perceptual-organizational" skills and more poorly developed "word-knowledge" skills for Group 2 children, they obtained mean PIC profiles essentially free of outstanding concerns with respect to personality maladjustment. Although there were distinctly elevated scales associated with Lachar's (1975) "cognitive development" factor (which includes the PIC Achievement, Intellectual Screening, and Development scales), no other PIC clinical scales exceeded 63 T for Group 2 children.
It would seem that virtually all of the prominent researchers in the area of socio-emotional disturbances of learning disabled children (e.g., Bruininks, 1978; Bryan, 1979b) have selected children for study who probably resemble closely Group 2 children in terms of their information processing strengths and weaknesses. If this be the case, there would seem to be additional questions that could be raised with respect to the direction and scope of current research dealing with socio-emotional disturbances in learning disabled children. It is clear that this type of (Group 2) child (i.e., one with well developed visual-perceptual and visual-spatial skills and more poorly developed linguistic skills) is not most "at risk" with respect to socio-emotional disturbances.

**Characteristics of Group 1 Children**

The mean PIC profile scale differences between Group 3 and Group 1 children were certainly not as distinct as those contrasts between Group 2 and Group 3 children. As is illustrated graphically in Figure 4, Group 1 children obtained mean PIC T-scores elevations on those clinical scales most sensitive to psychopathology that were, in most cases, intermediate to those of Group 3 and Group 2 children. Consequently, no statistically significant differences were obtained for any individual PIC scale or PIC scale composite score for Group 2 and Group 3 comparisons with Group 1.

This is not to suggest that clinically meaningful differences did not exist between the mean PIC profiles for Group 3 and Group 1 children. For example, the relationship between mean PIC T-scores
elevations for the Adjustment scale and Achievement scales for Group 3 and Group 1 children would appear to be quite different. Whereas Group 1 children have approximately equal elevations on these two scales, Group 3 children obtained a markedly elevated Adjustment scale and an Achievement scale mean T score which was approximately 10 points lower. The exact interpretation of this particular finding is beyond the "current state of the art" with respect to PIC profile analysis. However, the descriptive statistics contained in Table 5 indicate that Group 1 children exhibited a greater degree of academic impairment (especially with regard to reading and spelling achievement) than did Group 3 children. The discrepancy between Group 3 and Group 1 children with respect to WRAT Reading and Spelling achievement became even more distinct when there was an 8-point separation between the "word-knowledge" skills and the "visual-perceptual-organizational" skills to Group 3 children. In this regard, the descriptive statistics found in Table 12 indicate that Group 3 (n = 7) children exhibited significant academic impairment only in WRAT Arithmetic. Certainly, it can be assumed that better academic achievement by Group 3 children has contributed to lower PIC Achievement scale elevations for Group 3 children relative to those for Group 1 children.

In the second Study 2 procedure (n = 7), significant group differences were found between Group 3 children and Group 1 children on the combined "psychopathology-internalization" composite score. The Psychosis scale elevations for Group 3 children contributed most to the discrepancy between the two groups on this combined score
measure. The limited number of subjects in this procedure and a possible violation of assumptions with respect to random selection of subjects in Group 2 and, in particular, Group 1, undermine and bring into question the utility of these group comparisons. Better subject selection procedures and a larger number of subjects in each group will be needed to cross-validate these findings.

Younger and Older Study 2 Children

Younger (8- and 9-year-olds) and older (10-, 11-, '12- and 13-year-olds) Study 2 children were compared to investigate the possibility that PIC age-related differences exist for these learning disability subtypes. Study 1 had revealed statistically significant differences between younger (in this study, 8-year-olds) and older (12-year-olds) children on the PIC "cognitive development" composite score. Univariate analyses indicated that the PIC Intellectual Screening scale "contributed" most to the "cognitive development" composite score group differences. Higher PIC Intellectual Screening scale elevations were found for the younger children as compared with the older children. No statistically significant differences between younger and older Study 1 children were found on the composite PIC "psychopathology-internalization" and "personality deviance" measures.

In Study 2, no significant group differences were found between the younger and older children on any of the three PIC composite scores or on any of the individual PIC profile scales.

On the surface, this Study 2 finding would appear to cross-validate two Study 1 results (no differences between younger and older
children on the PIC "psychopathology-internalization" and "personality deviance" composite scores) and fail to offer support for one Study 1 result (older children exhibited significantly lower PIC "cognitive development" values than did the younger children). However, the following must be considered to understand fully the Study 2 results: (1) the younger group of Study 2 children included 9-year-olds as well as 8-year-olds; (2) younger Study 2 children were superior to older Study 2 children on most measures of psychometric intelligence (see Table 6); (3) it would appear that younger and older Group 1 children did not exhibit the same pattern of results as did younger and older Group 2 and Group 3 children on the PIC Achievement, Development and Intellectual Screening scales (see Table 11 and Figure 6).

Close inspection of Figure 5 indicates that younger Study 2 children did exhibit higher mean PIC T score elevations than did older Study 2 children on all three "cognitive development" scales. These group differences may have been greater on these scales (especially the Intellectual Screening scale) had the two groups been matched for WISC Full Scale IQ and had Group 1 children not been included in these comparisons.

On the other hand, two, possibly interacting variables, would appear to be complicating the interpretation of Study 2 results with respect to comparisons between younger and older children on the the PIC "psychopathology-internalization" and "personality deviance" measures.

(1) Lower levels of psychometric intelligence for older Study
2 children should, if anything, have had the effect of elevating concerns about their personality adjustment (Peter & Spreen, 1979).

(2) The inclusion of 9-year-old children in the Study 2 younger group should, if anything, have minimized the differences between older and younger Study 2 children on the PIC "psychopathology-internalization" and "personality deviance" measures (in view of the findings obtained in Study 1).

Therefore, the results obtained in Study 2 with respect to comparisons of younger and older children on the PIC profile scales are quite difficult to compare directly with the results obtained in Study 1. However, the weight of the evidence does suggest that no appreciable differences exist between younger and older Study 2 children on the PIC scales thought to be most sensitive to psychopathology.

The Clinical and Research Utility of the PIC with Learning Disabled Children

Study 1 and Study 2 constitute essentially exploratory studies with respect to the use of the Personality Inventory for Children with learning disabled children. As was found in the Porter (1980) study, meaningful differences between groups of learning disabled children were obtained through the employment of this instrument. Furthermore, within the context of what is known clinically about children in Group 3, the mean PIC profile exhibited, particularly in Figure 8, would seem to be quite meaningful. In general, it has been found that the parents of Group 3 children (particularly the mothers) express a great deal of concern about their children's
personality development and behaviour. Children with well-developed "automatic" verbal abilities and more poorly developed visual-perceptual and visual-spatial skills are often described by their parents and others as being somewhat "unusual". Almost always, it is said that these children have poor social skills and poorly developed self-help skills.

The strong inter-correlations between some PIC profile scales, and the degree of item overlap (particularly with respect to the PIC Psychosis, Anxiety, and Withdrawal scales) pose some limitations on the clarity and meaningfulness of results obtained from the composite scores (e.g., the "psychopathology-internalization" measure) employed in this study. There would seem to be no practical way around this problem except by eliminating those scales from the composite scores which have a higher inter-correlations with other PIC scales due to possible item overlap. This problem should be addressed in future research with the PIC.

Group 3 Children - Future Considerations

It is clear that there are concerns with respect to the personality development of Group 3 children. These concerns would seem to be characterized best by certain properties of the PIC Psychosis scale. An item analysis of the PIC Psychosis scale is required to investigate further items which might best identify the common characteristics of Group 3 children.

It would seem likely that the cognitive deficiencies of Group 3 children are interacting directly with the (perceived) personality disturbances of these children. For example, impaired visual-per-
ceptual and visual-spatial abilities prevent effective development of certain non-verbal skills that are important for successful interactions in novel social situations. Furthermore, there may be an inappropriate use of language in social situations as a substitute for non-verbal gestures. This has implications for both the treatment and identification of these children.

Unfortunately, we have found that these (Group 3) children are least likely to be identified as being in need of special intervention. This is likely to be especially the case when they are younger because of their proficiencies in reading and spelling. When compared with the "usual" learning disabled child, their academic difficulties almost always appear to be minimal to their teachers. It goes without saying that the early identification and formulation of appropriate treatment plans which take into account the extent of the inadequacies and deficiencies of these (Group 3) children constitute the most important future clinical research implications emanating from Study 2. Every effort should be made to identify, treat, and follow children who are identified as having difficulties similar to those of children in Group 3 because this learning disability subtype would appear to be most "at risk" for socio-emotional disturbances.
Appendix A

Psychosis Scale (PSY): Items Grouped by Factor Loadings, Direction of Scoring and Overlap with Other Profile Scales

<table>
<thead>
<tr>
<th>I. Isolation from Peers (48.36%)</th>
<th>154. My child believes in God. (F) (T: IS: F: F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>My child has very few friends. (T) (T: SSK)</td>
<td>328. My child seldom talks. (T) (T: D, WDL: F, IS)</td>
</tr>
<tr>
<td>My child often brings friends home. (F)</td>
<td></td>
</tr>
<tr>
<td>173. My child seems to know everyone in the neighborhood. (F)</td>
<td></td>
</tr>
<tr>
<td>II. Toilet Training Problems (10.10%)</td>
<td>471. My child can take a bath by him (her) self. (F)</td>
</tr>
<tr>
<td>448. My child was difficult to toilet train. (T)</td>
<td>60. My child usually undresses him (her) self for bed. (F)</td>
</tr>
<tr>
<td>571. My child was completely toilet trained by three years of age. (F)</td>
<td>418. My child gets lost easily. (T)</td>
</tr>
<tr>
<td>III. Emotional Outbursts (8.33%)</td>
<td>120. Sometimes my child runs errands for me. (F) (T: IS: F: F)</td>
</tr>
<tr>
<td>24. Little things upset my child. (T) (T: D)</td>
<td>489. By the age of five years, my child could dress him (her) self except for tying things. (F)</td>
</tr>
<tr>
<td>460. I had an especially difficult time with temper tantrums in my child at an early age. (T)</td>
<td>97. My child could ride a tricycle by age five years. (F) (F: F)</td>
</tr>
<tr>
<td>53. My child is liable to scream if disturbed. (T)</td>
<td></td>
</tr>
<tr>
<td>550. Frequently my child will put his (her) hands over his (her) ears. (T)</td>
<td></td>
</tr>
<tr>
<td>IV. Infrequent Behaviors and Beliefs (6.42%)</td>
<td>585. My child often has crying spells. (T) (T: F, D, ANX)</td>
</tr>
<tr>
<td>54. My child sometimes undresses outside. (T)</td>
<td>572. My child often will cry for no apparent reason. (T) (T: D)</td>
</tr>
<tr>
<td></td>
<td>VII. Lack of Judgement (3.44%)</td>
</tr>
<tr>
<td></td>
<td>504. My child is able to keep out of everyday dangers. (F) (F: F)</td>
</tr>
</tbody>
</table>
Appendix A Continued

401. I have often found my child playing in the toilet. (T) (T: DEF: F: IS)
536. My child needs protection from everyday dangers. (T)

508. My child likes parties. (F) (F: F)

222. My child likes to play active games and sports. (F)

416. Usually my child plays inside. (T)

297. My child usually plays alone. (T) (T: D, WDL)
533. My child could eat with a fork before age four years. (F) (F: DVL, ACH)

164. My child doesn't seem to care to be with others. (T) (T: F, D, WDL: F: IS, HPR)

a indicates percent of common variance
b indicates overlap and scoring direction of overlapping items

322. My child would rather be with adults than with children his (her) own age. (T) (T: SSK)

IX. Lack of Communication (2.82%)

490. My child most always tells me where he (she) is going to play. (F) (T: IS)

X. Peer Rejection (2.72%)

340. Other children make fun of my child's different ideas. (T) (T: F)

69. My child is usually rejected by other children. (T) (T: SSK)

XI. Inappropriate Affect, Disorientation (2.29%)

379. Often my child will laugh for no apparent reason. (T) (T: F)

131. My child has had brief periods of time when he (she) seems unaware of everything that is going on. (T)

426. Often my child will wander about aimlessly. (T)
528. Sometimes I don't understand what my child means. (T)

Other

74. I am afraid my child might be going insane. (T)

91. My child never takes the lead in things. (T) (T: SSK)

115. Often my child goes about wringing his (her) hands. (T)
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