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UNIVERSITY OF ALBERTA

A SCREENING/REFERRAL INSTRUMENT FOR SCHOOL-BASED OCCUPATIONAL THERAPY: AN ITEM VALIDATION STUDY

BY

ANU TIRRUL-JONES

A THESIS

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ABSTRACT

As part of the development of an instrument for referring students to occupational therapy (OT) in schools, a survey of Alberta elementary school teachers was conducted in the spring of 1990. Teachers who worked in school districts outside Edmonton and Calgary and had a minimum of one year of teaching experience responded to a questionnaire by rating 64 items on a four-point scale in two sections. The "impact" section reflected the extent to which a behavior (an item) would hinder students' ability to benefit from their educational programs, while the "referral" section rated the need for referral to personnel outside the classroom. From 328 potential respondents a response rate of 31.7% yielded 104 useable replies.

The teachers were categorized according to their level of experience in special education and the extent of special educational programming within their schools. Responses in these groupings were compared. Additionally, data from the Magill-Evans and Madill (1990) survey of occupational therapists with and without school experience was contrasted with that of the teachers.

The items were divided according to domains of OT practice: activities of daily living, cognition, psychosocial, sensorimotor, and therapeutic adaptation/prevention. Fifty-three of the 64 items were endorsed by both therapists and teachers as indicators for referral; no item was rated as unimportant by both groups. While activities of daily living, sensorimotor, and therapeutic adaptation/prevention behaviors were more important to therapists, for teachers, the cognitive and psychosocial items were more pressing indicators for referral and the most important "impact" items. The most significant differences of opinion about the items were between the two professional groups whereas intra-professional scoring was comparatively homogeneous.

Implications for further development of the instrument and recommendations for additional research are discussed. Suggestions are provided for school-based OT practice based on the results of this study.

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CHAPTER I

The Research Problem

Introduction

Occupational therapy (OT) practice in school-based settings is increasing. A recent survey revealed that at least 162 or 48% of the 341 pediatric therapists on record with the Canadian Association of Occupational Therapists (CAOT) had school-related experience (Magill-Evans & Madill, 1990). In the USA this area of practice is now the second largest employment sector for therapists (American Occupational Therapy Association [AOTA], 1989). Practice in this relatively new setting for occupational therapy differs from that in traditional medically related settings.

In school-based practice therapists work within an administrative structure that varies significantly from that found in health services, with difierent communicative and role demands (Magill-Evans & Madill, 1990). The models and guidelines for service, the screening and assessment tools, and the interdisciplinary educational materials needed to facilitate school-based practice are still in the early stages of development. A screening instrument is being designed in the Department of Occupational Therapy at the University of Alberta that will provide teachers with a valid and reliable means of referring students who have learning difficulties that can best be assisted by occupational therapy intervention. It is anticipated that this project will contribute to the formulation of a frame of reference for school-based occupational therapy in Canada (Magill-Evans & Madill,1990).

Purpose of the Study

The objective of this study is to provide additional validity data for the design of the screening instrument. The instrument is developed to the point that 66 items have been generated; they have been determined to be within the domain of pediatric occupational therapy practice and have been categorized according to five areas of OT practice (Magill-Evans & Madill, 1990). Additionally, Canadian pediatric occupational therapists were surveyed to discover the level of importance that they assigned to the items as indicators of a need for occupational therapy services (Magill-Evans & Madill, 1990).

This study examines the degree to which the behaviors described by the screening items are viewed by Alberta elementary school teachers as hindering students' ability to benefit from their educational programs. It also investigates

whether the teachers consider that these behaviors indicate a need for referral to other personnel. Teachers' responses about the items as referral indicators are compared to those from the study of occupational therapists (Magill-Evans & Madill, 1990).

The data from this investigation will eventually be examined with those from the therapist survey and from a study of school administrators (Anderson, 1991). The result of that review will be a preliminary screening instrument with the selected items being assigned weights.The instrument will then be tested for sensitivity, specificity, and reliability (Magill-Evans & Madill, 1990).

Research Questions

1. Which of the potential screening instrument items do the teachers consider:
   a) an important hindrance to students' ability to benefit from their educational program,
   b) an important indicator for referral to personnel outside the classroom,
   c) important both as a hindrance to education and an indicator for referral.

2. Which items do teachers with and without special education experience agree are important hindrances to learning and/or indicators for referral? On which items do their opinions differ?

3. Which items do teachers from schools with extensive special educational programming and those from schools without such programming agree are important hindrances to learning and/or indicators for referral? On which items do their opinions differ?

4. Which of the items do teachers and occupational therapists agree constitute reasons for referral? On which items do their opinions differ?

5. Do the teachers and the occupational therapists differ in their opinions about groups of items constituting a reason for referral when the items are divided into the categories of daily living skills, psychosocial skills, sensorimotor skills, cognitive components, and therapeutic adaptation/prevention?

6. Are there differences in the opinions of teachers and pediatric occupational therapists in relation to their years of experience?

Definitions

Integrated classroom: a regular classroom in which one or more students who require a special education program are enrolled. The majority of the students receive regular instruction and the teacher does not need special education qualifications to teach the class.

Referral: a formal request made by a teacher for assistance with a student's educational program. Usually a referral is sent to a particular consultant or department. An evaluation of the student is usually expected. This term does not imply referral for student placement problems only.

Regular classroom: a classroom in which all the students receive the courses of study prescribed for that grade level. Special education programs are not part of the course of instruction.

School-based practice: occupational therapy services offered in an educational setting to school personnel and students.

Screening: the process of identifying students for assessment (Sensory, 1979, p. 7). If the assessment is to be done by someone other than the classroom teacher, a referral to the appropriate individual would follow screening.

Special education program: "by virtue of the student's behavioral, communicational [sic], intellectual, learning, or physical characteristics, or a combination of those characteristics," a student may be deemed to require educational programming other than or in addition to that offered as a matter of course to students in his or her grade level (Province of Alberta School Act, 1988, Section 29[1]).

Delimitations

For the purposes of this investigation the following delimitations were made:

1. The educators selected were elementary school teachers with at least one year of teaching experience.

2. The teachers were from Alberta, outside the metropolitan areas of Calgary and Edmonton.

3. The schools from which teachers were selected were from public jurisdictions and did not include private schools or government correctional institutions.

Limitations

The mailed questionnaire survey design has some inherent limitations: the respondents are volunteers and their self-selection interferes with representativeness, the questions may not have been understood, the framing of the questions can skew responses, and there is no assurance about who answered the question (Isaac & Michael, 1981). Permission was required of superintendents and principals before teachers could be contacted which complicated the selection process since some refusals occurred at this non-respondent level.

The division of schools into those with and those without extensive special educational programming was done by one knowledgeable person according to preset criteria. As this classification did not use information provided directly by the schools the possibility of mistaken classification decisions due to personal bias or information error was increased.

The results of this investigation are valid for those who responded. They cannot be generalized to those who declined to take part or for whom permission to participate was refused by the superintendent or principal; nor can they be generalized to non-elementary grade teachers or to teachers outside the survey area.

CHAPTER II

Literature Review

Occupational therapists first worked in public schools in Canada 60 years ago (Robinson, 1981). In the USA, therapists are reported to have begun working in schools during the 1940s (Royeen, 1986). Most of the early work in both countries was done by a small number of therapists who provided traditional medically based service in specialized classes for handicapped students, and otherwise had little contact with the education system (Kalish & Pressler, 1980).

In the 1960s a profound change began to take place. In many industrialized countries there was movement away from centralized institutions for the handicapped and toward the provision of educational and living arrangements in local communities (Jenkinson, 1987). The CELDIC Report in Canada, the Warnock Report in Great Britain, and American Public Law 94-142 are major documents resulting from this movement (Lazure, 1970; US PL 94-142, 1975: Warnock, 1978). Each document urges that the special services (including OT) that were previously provided in residential institutions now be available to handicapped students in their community settings, including schools.

Other studies such as a task force report on services for physically handicapped children in Ontario and the sensory multihandicapped project report in Alberta followed, with recommendations that occupational therapists should practice in school systems (Altopiedi, 1976; Sensory, 1979). Consequently, OTs in significant numbers began to work in public school systems in the 1970s and 1980s.

From 1973 to 1982 the proportion of American therapists working in schools rose from 11% to 18% (Clark, Mack & Pennington, 1988). Presently it is estimated that 11,000 occupational therapists and certified occupational therapy assistants work in the public schools in the USA (Chandler, 1990). In Canada many therapists working in schools are in fact employed by hospitals or public health units. Though only 72 therapists reported being employed by school boards in 1989 (Canadian Association of Occupational Therapists (CAOT) 1990a), the Magill-Evans and Madill (1990) study showed that at least 48% of the 341 Canadian pediatric therapists had school related experience. In another Canadian study, only 2 of 22 therapists who worked in elementary schools were employed by school boards (Beckett, 1981). Thus, the small number directly employed by school boards is not indicative of the total number of therapists that provide service in Canadian school systems.

The trend of occupational therapists working in school-based settings can be expected to continue. This assumption is based upon the following: there continue to be school-aged children with handicaps, occupational therapy continues to be one of the main avenues of assistance for these children, and the de-institutionalization of individuals with disabilities is an established practice (Sensory, 1979; CAOT, 1990b). Therefore the services required by children with special needs will be offered in the community facilities they use which are primarily schools (Brewer, McPherson, Magrab & Hutchins, 1989). These facilities will therefore continue to require specialized knowledge available from professionals such as occupational therapists.

Larter, Cheng, Chandorkar, and Willet (1982) also summarized some factors contributing to the trend of therapists working in school systems. Due to medical advances, increasing numbers of handicapped children survive to school age and beyond. Because of decreasing architectural barriers, disabled persons now have greater access than ever before to community facilities. Mobility has also been enhanced by advances in bio-engineering and rehabilitation technologies.

Attitudinal factors influence the provision of special services in schools (Larter et al., 1982). Parents and other advocates for handicapped children feel strongly that the regular school system is the place for education of all children. There is also a growing realization that no clear delineation can be made between the handicapped and the non-handicapped: rather a continuum of services for a continuum of learning needs must be provided.

One of the service needs within the educational system in future will be occupational therapy. However, the short history of modern integrated education has left some major problems still to be resolved by therapists in school-based practice.

Australian, British, American, and Canadian writers, both educators and therapists, have described the collaboration difficulties between therapists and teachers (Bloom, 1988; Jenkinson, 1987; Orelove & Sobsey, 1988; Baine, 1984, Ottenbacher, 1982; Pankhurst, 1980). Two professional traditions meet when a therapist and teacher work together to alleviate student learning difficulties and the differences between the medical and educational approaches are very evident (Nole, 1982). This was not particularly problematic when therapists provided isolated direct treatment outside the classroom--under these conditions, a medical orientation was simply being used in a different location. However, this mode of service is now only useful in a limited number of situations since today integrated education demands that services be educationally relevant and provided as much as possible within the classroom (Baine & Sobsey, 1983; Royeen & Marsh, 1988). Friend (1988) pointed out that

the direct service delivery mode is also costly and consequently unrealistic in many school jurisdictions. Health care and educational agencies must cooperatively service children and youth because the expense of past "solo practices" is no longer tenable (Gilfoyle, 1984, p. 581).

Working more closely together is advocated by both educators and therapists, but certain difficulties must be overcome. Ottenbacher (1982, 1983) described the differences between educational and medical terminology, belief systems, and approaches to problems which may cause confusion for therapists and teachers. Ignorance of each others' professions brought about by isolated training can cause misunderstandings (Baine & Sobsey, 1983). Bell (1984) spoke of the need for role negotiation between occupational therapists and teachers so that school personnel know who therapists are and what they plan to do in schools. Some writers speculate that teachers may mistakenly assume that they can offer the same services therapists do in schools (Bloom, 1988; Hightower-Vandamm, 1985), and that therapists can overtax teachers' reserves of emotion and time by seeing them as program carry-over agents (Haslam & Valletutti, 1985). Moreover, Larter et al. (1982) found that 56% of the Toronto elementary school teachers surveyed did not know that consultants were readily available to them. This suggests that in addition to collaboration difficulties some opportunities to work with other professionals were missed even when specialists were available.

Crowe and Kanny (1990) described problems which are developing as integration into community schools increases. Therapists spend more time travelling to more schools, which makes time for interdisciplinary communication harder to schedule. The physical space and equipment available in some schools limits the therapy techniques possible, hampering the effectiveness occupational therapy.

Baine (1984) mentioned several consequences which occur when teachers and other specialists work in relative isolation. The lack of communication and coordination can result in omission or overlap of service, or counter-productive services. The problems addressed by non-teaching professionals, including OTs, may not be those that have high priority or are even typically manifest in the classroom. Disciplines not familiar with classrooms may make recommendations which seem irrelevant or worse, inappropriate to the classroom environment. This can be very frustrating for the teacher who probably initiated the referral. A 1985 survey of Oregon special services to children with orthopedic problems found that physical and occupational therapy services were the most problematic; next to fragmented,

patchwork service systems, the most troublesome aspect was the isolated, discipline specific, goals of therapy (Reed, Cicirello, & Hall, 1987)

As partial answers to these collaborative difficulties many authorities have called for greater communication between the professions and a greater effort on the part of therapists specifically to explain occupational therapy in educationally relevant terms (Baine, 1984; Bell, 1984; Royeen & Marsh, 1988). In her description of a psychosocial OT program in schools, Agrin (1987) stressed the commonality of OT goals with educational ones and their straight-forward, unambiguous, and clearly relevant nature which lead to high educator understanding and acceptance. Brintnell and Goldenberg (1984) observed that the amount of cooperation that different professionals offer each other is usually dependent on the level of understanding that each one has of the others' contributions to the client's well-being.

The short history of modern integrated education has given occupational therapists little time to develop tools for school-based practice which may help resolve some of these difficulties. The collaborative efforts of teachers and therapists begin with the first step in occupational therapy practice, namely screening (AOTA 1989; CAOT, 1990b; Department of National Health and Welfare [DNHW] & CAOT, 1983)

Screening is a responsibility shared by therapists and teachers and takes 10% to 15% of therapists' time (Campbell, 1987). Being a joint venture, screening is potentially fraught with coordination difficulties. A screening instrument which lists problems that occupational therapists can help ameliorate and which describes these problems in educational terms can provide a good base for inter-professional co-operation, especially if there is some basis for believing that both professionals view the identified problems as important and relevant.

Some screening instruments are described in the literature but they have been designed by therapists alone or offer no history of their development (Kauffman, 1988; Langdon & Langdon, 1983; McKee et al, 1982; Pratt, Coley, Allen & Schanzenbecher, 1989; Stowers & Huber, 1987; Wisconsin, 1987). In addition, these and other instruments exhibit shortcomings, such as a lack of reliability, validity, sensitivity, and specificity (Carr, 1989). Some are based on particular theories of intervention (such as sensory integration) and few have items from all evaluation areas identified in the AOTA standards of practice.

The available screening tools are also limited by another factor for Canadian therapists. Most instruments are American in origin and therefore designed for the use of occupational therapy as a "related service", i.e. , a service related to a student's special education program (AOTA, 1989; US PL 94-142, 1975). In Canada there is no such

restriction and therapy may be the only form of special service a student receives. Both the referral process and the type of learning problems referred to therapists in Canadian school-based settings may thus differ significantly, necessitating a screening tool designed for Canadian use. The difference probably lies in a broader Canadian scope of service, making American tools not so much inaccurate as perhaps incomplete for Canadian purposes. This remains to be investigated.

A screening instrument is used "to identify individuals for follow-up assessment at the lowest cost without an undue amount of over- or under- identification." (Sandoval, 1981). Screening efficiency is very important since the chronic shortage of therapists and their "employment instability" or great turn-over of staffing are well known and documented (Crowe & Kanny, 1990; McClelland and Hirata, 1986; Renwick, Friedland, Sernas, & Raybould, 1990). A screening tool which fits the above definition helps to use available personnel to best advantage.

Some American authors suggest that occupational therapy services vary from school district to school district and therapist to therapist, including variability in criteria for receiving service (Carr, 1990; McClelland & Hirata, 1986). This occurs despite legislation and national association guidelines which delineate the role of occupational therapy in school systems. It would seem likely that this variability also exists in Canadian practice especially because of the lack of legislation or national guidelines. A screening tool that is accepted by large numbers of therapists would help increase uniformity of practice. Reliability and validity information must be available for this to occur so that the users can assess the usefulness of a tool in their particular set of circumstances (Sandoval, 1981; Rogers, 1987).

In designing the list of screening items the Uniform Terminology for Reporting OT Services was first used to construct a 70 item Problem Identification Checklist. This ensured that the problems noted were within an accepted OT service mandate (content validity). The checklist was subsequently used by 11 teachers of students with special needs in the first of several pilot projects which also included school-based therapists attending the Great Southern OT Conference in New Orleans, fourth year OT students at the University of Alberta, three Canadian therapists working as school-based consultants, and the faculty of the School of OT at Dalhousie University to develop the checklist further. These studies further established that the instrument adequately sampled an accepted OT service mandate (content validity) and that it addressed problems actually experienced by students in their educational environment (construct validity).

Canadian pediatric therapists were then surveyed to determine the level of importance that they assigned to the items as indicators of the need for occupational therapy services (Magill-Evans & Madill, 1990). Many of the items were also on a list which Daffner (1987) used when surveying approximately 350 American therapists and educators. She investigated the validity of a number of indicators for referral to OT in the school system and the similarity of some items with those in the Magill-Evans and Madill (1990) study allowed for comparison and additional validation.

To develop the instrument further, this study was designed to provide validity data gathered from educational settings. The instrument will thus have validity information available from both user groups: educators and occupational therapists. This is the type of collaborative, cross-professional work called for in the literature (Baine & Sobsey, 1983; Ottenbacher, 1983; Giangreco, 1986).

CHAPTER III

Methodology

Introduction

A sample of Alberta elementary school teachers was asked to complete a two page questionnaire which they received from their principal's office. The questionnaire required that they score 64 items on a two-part Likert type scale and answer two inquiries about the length of their regular and special education teaching experience.

The data was analyzed to identify those items which received high and low scores by large numbers of teachers. Items rated by teachers with and without special education experience, and by teachers working in schools with and without extensive special education programming were compared.

Comparison was also made with ratings given by occupational therapists in the Magill-Evans and Madill (1990) study. Here the items had been grouped into five categories. Analysis of variance was used to help determine whether the groups of items were scored differently by therapists and teachers.

Sample

The population of interest was Alberta elementary school teachers who:

- were located outside the metropolitan areas of Edmonton and Calgary
- had a minimum of one year of teaching experience
- were teaching within the regular school system, i.e. not private schools or government institutions like remand centres
- had principals and superintendents who allowed participation

Ease of accessibility and cost containment limited the population to non-metropolitan Alberta teachers. The elementary school level, that is grades one to six, was chosen because most therapists work with students in those grades (Gilfoyle & Hays, 1979). At least one year of teaching experience was required to match the experience level of the OTs. The opinions about the items can thus be said to reflect at least a year of practical experience.

The population was stratified into two groups: teachers from schools with extensive special education programming and teachers from schools without extensive special education programming. The List of Operating Schools in Alberta identified schools having an "elementary special education program" but did not describe what type of special education was offered. Therefore it would contain programs for the gifted

and for English as a second language as well as schools having one special needs student for the first time; all categories that were not relevant to this study. Another method for identifying schools which were familiar with special educational programing was necessary.

An official from the Response Centre of Alberta Education who was very familiar with special education programs throughout the province was used to identify schools which had limited or no special education programs and those which were experienced special education providers for mentally retarded, multiply handicapped, physically disabled, learning disabled, and developmentally delayed students. The latter schools had several students enrolled with a variety of special needs for several consecutive years. Specialists within a variety of disciplines had assisted students and staff in those schools. A variety of situations were thus included within these criteria. For example, a large school had several classrooms for handicapped students as well as resource rooms and integrated classrooms while a small school had a few handicapped students for whom there had been much consultation in integrated classrooms for several years. The goal of the stratification was to identify schools in which teachers could be expected to have been exposed to aspects of special education, even if not directly responsible for special educational teaching themselves, and those which were known to have more limited exposure to special education.

The sample was selected by stratified cluster sampling. Schools were randomly chosen from each of the two groups, keeping the number of teachers roughly equal. Superintendents from the jurisdictions in which the chosen schools were located were then asked for permission to contact the schools. Survey packages were sent to the schools for which superintendent permission was granted. Some superintendents and principals refused to participate. Sample size prior to mailing was 333; it was not finalized until questionnaires were returned because then respondents with less than one year of experience could be eliminated. Table 1 shows the stratification of the sample.

Table 1

Stratification of the Sample

	Special education	Non-sp. education	Total
Number of schools	12	19	31
No. of potential respondents	158	175	333

Determination of the number of elementary grade teachers in the schools was done using three sources of information: the List of Operating Schools in Alberta, the Teacher Certification Branch of Alberta Education, and school principals. If a school had only elementary grades, the total number of teachers in the list of schools was used. For schools which had additional grade levels, the number of elementary grade teachers on record at the Teacher Certification Branch was used. For schools which were contacted by telephone for follow-up, the principals were asked about the number of teachers who taught elementary grades. Occasionally the information given by principals differed from that of the other sources, but the number of teachers supplied by the principal was considered to be the most accurate.

Instrument

The screening instrument used in this investigation is currently under development. Presently it contains 66 items which reflect student behaviors that are associated with learning problems. It has been determined that these items are representative of occupational therapy practice and that singly or in combination they indicate a need for OT service (Magill-Evans & Madill, 1990).

For this survey the wording of some of the items was slightly changed to make language usage more consistent throughout the list, to improve spacing on the questionnaire form, or to substitute terms in order to describe the behaviors without using terminology specific to the occupational therapy profession. The changes are listed below and were not considered sufficient to compromise later data comparisons between samples of teachers and therapists. In the list that follows the first item of each pair is from the original questionnaire from the OT study, the second is the item as it appeared in this study.

2. By age 10, pays little attention to his/her appearance; is messy and unkempt.
   By age 10, pays little attention to personal appearance; is messy and unkempt.

10. Cannot heel-toe walk, hop on one foot, or jump in place.
    Cannot hop on one foot, jump in place, or walk so that heel of foot strikes ground before rest of foot.

24. Has extreme tightness at any joint which limits function.
    Has extreme stiffness at any joint which limits function.

58. Does not recognize when help is needed; doesn't request help.
    Does not recognize when help is needed; does not request help.

59. Cannot realistically identify his/her strengths & limitations.
    Cannot realistically identify his strengths & limitations.

64. Is unaware of others' feelings & needs; does not recognize nonverbal cues.
    Is unaware of others' feelings & needs; doesn't recognize nonverbal cues.

Items 19 and 20 were eliminated from this study as they refer to skills not expected in elementary grades. They were stroked out rather than completely deleted to maintain the same numbering of items as in the first study for easier data analysis.

The scale used in the Magill-Evans and Madill (1990) survey was also modified. Teachers were asked to indicate on a four-point scale the degree to which the behavior described in each item was an indication for referral, as the therapists were requested to do. However, the scale for teachers in this study does not specify referral to occupational therapy. Occupational therapy is unfamiliar to many teachers. Whether or not an item would result in a teacher seeking assistance might be unclear if the only assistance under consideration was little known. The scale appeared as follows:

Referral

1 = never indicates a need for referral to personnel other than classroom teacher.
2 = may indicate a need for referral to personnel other than classroom teacher.
3 = frequently indicates a need for referral to personnel other than classroom teacher.
4 = always indicates a need for referral to personnel other than classroom teacher.

The second modification was to expand the scale by adding a section that asked the teachers' opinions about how much of a hindrance the behaviors would be to a

student's benefitting from his or her education program. The four-point system and parallel weighting and description is given below:

Impact

1 = never hinders the student in benefitting from educational program.

2 = may hinder the student in benefitting from educational program.

3 = frequently hinders the student in benefitting from educational program.

4 = always hinders the student in benefitting from educational program.

The two part scale was used to obtain information about the teachers' opinions of the educational relevance of the items. With the expanded scale, items could be identified which might be significant hindrances to learning but which did not necessarily lead to referral. By contrast, items could be noted which were not deemed to have an important educational impact but which nevertheless frequently indicated a need for referral, presumably for some non-educationally related reason.

Pilot Study

A pilot project was conducted to help finalize the questionnaire format. In particular, information was sought about the clarity of the wording, readability of the design, and the time required to complete the form.

The pilot sample was one of convenience. Teachers volunteered in two elementary schools and filled out the questionnaire while the author was present to answer questions and note comments. Additionally, six teachers who were recommended by the author's colleagues were contacted by mail. Seventeen elementary grade teachers in Edmonton participated in the pilot project.

As a result of this preliminary study, the final length of two pages, the fonts, the spacing, and the wording were decided. See Appendix 1 for a copy of the final questionnaire. The majority of respondents completed the questionnaire in 15 to 20 minutes. In the early stages of questionnaire development, much more background information was asked of the respondents. This resulted in questionnaires of three pages or more. A less lengthy format was strongly supported by the pilot respondents so the additional information was sacrificed for a shorter document which would favour a higher return rate.

Data Collection

Superintendents of the selected schools were mailed a package containing:

- a letter of transmittal (Appendix B)
- a form to sign indicating either approval or non approval of the project for schools in the jurisdiction (Appendix B)

- a sample of the transmittal letter to principals (Appendix C)
- a sample of the transmittal letter to teachers (Appendix D)
- a questionnaire (Appendix A)
- a stamped, addressed return envelope.

When permission was granted, the principals of the schools which had been chosen in that jurisdiction were mailed a survey package containing:

- a letter of transmittal
- questionnaires with teacher transmittal letters attached
- a stamped, addressed return envelope.

The teachers most likely received the questionnaires and transmittal letters in their school mail slots and returned their questionnaires to the principal's office.

A follow-up telephone call was made to superintendents and principals if no replies had been received within two to three weeks of mailing the survey packages. If a superintendent gave his permission over the telephone, mailings were immediately sent to the respective principals. Eventually written permission was received from all the superintendents.

If the number of completed questionnaires was more than 10% short of the total number of possible respondents, a small number of additional questionnaires with a stamped addressed return envelope were included with the thank you letter to the principal. Each of these follow-up transmittal letters to teachers had a hand written note encouraging participation in the study.

The number of randomly selected schools in each strata was greater than that represented by the initial mailings to superintendents. Despite refusals at the superintendent and principal levels, the sample size of approximately 300 teacher could be maintained by contacting the superintendents and principals of the alternative schools. This resulted in the data collection proceeding in two waves: one in which initial mailings to superintendents were followed by mailings to schools, and another in which the original mail-out had resulted in refusals and so the process began once more with a request to another superintendent.

In total, 483 questionnaires were mailed. Data collection began in early April 1990 with the first mailings to superintendents and ended in early July with receipt of the last batch of returned questionnaires.

Data Analysis

Data from all respondents on the impact section of the scale were compared to those on the referral section. The data were also tabulated according to two kinds of teacher grouping: (a) those with and without special education experience, and (b) those from schools with and without extensive special educational programs. Items scored on each section of the scale by both groups of teachers were compared.

The items scored by the teachers and therapists on the referral section of the scale were compared (Magill-Evans & Madill 1990). Reference was also made to items identified in the Daffner (1987) study.

Frequency counts and percentages were used for most of these comparisons. Scoring categories numbered 3 and 4, described as "frequently" and "always" were considered together as they were in the Magill-Evans and Madill (1990) study. For ease of description, items scored 3 or 4 are referred to as "important". Similarly, a score of 1, described as "never", was considered separately and the behavioral descriptors scored this way are referred to as "unimportant". Items scored 2 , though on the continuum of opinion and therefore not neutral like a "no opinion" category would have been, were nevertheless considered to be neither sufficiently strong for a clear endorsement nor sufficiently weak for an expression of lack of support, and are not discussed.

The 70% cut-off point used in previous studies for items scored as important (Daffner, 1987; Magill-Evans & Madill, 1990) was also used in this one. The 70% criterion represents the minimum percentage of respondents who scored an item as important in order for that item to be classified as strongly endorsed. Initially, this was the only firmly established criterion and it served well in previous studies because a sizeable number of items fell within this range. However, in this investigation far fewer items were captured in this manner and had it been the only criterion used to categorize the data, the great majority of items would have been left out of all but the preliminary analysis.

Comparison of items identified by teachers and therapists was particularly important. The future development of the screening instrument, of which this study is a part, will be based upon the opinions of teachers, therapists, and school administrators. A basic premise in the design of the project is that it is not enough to identify items for the instrument that are important for therapists. Therefore in this study it was not enough to identify important items for therapists with which teachers also agree. Items important to teachers with which the therapists did not agree were of great interest as well. In the process of trying to find items which were important to

both groups, the degree of importance accorded to the items by either teachers or therapists could not be lost.

When comparing the scoring of items by two groups of respondents, items that did not meet the 70% criterion of both groups could not automatically be said to be unimportant, nor could they be considered to have generated noticeably different opinions between the two groups. If an item was scored as important (a score of 3 or 4) by less than 20% of respondents or if it was scored by more than 20% as being unimportant (a score of 1), then that item was considered to have met a criterion for poor endorsement. Therefore those items that were most poorly supported met both criteria: having few scores of 3 or 4 and relatively many scores of 1.

A third criterion was used to acknowledge the items scored 3 or 4 by a majority of a respondent group. The 50% cut-off was useful to compare the large number of items which remained after identification of those that were very important and unimportant.

Further analysis was carried out on the referral section of the scale with data classified in five categories: activities of daily living, psychosocial skills, sensorimotor skills, cognitive components, and therapeutic adaptations/prevention. With these categories as five dependent variables, one way analysis of variance (ANOVA) procedures were done to determine differences among groups of teachers and therapists. Two-way ANOVAs were not appropriate as special education experience (for teachers) and school-related experience (for therapists) are not equivalent levels of one factor. Although MANOVAs are appropriate with multiple dependent variables, such analyses were beyond the scope of this paper. This is one limitation of the analysis reported in the subsequent sections.The Statistical Package for Social Sciences (SPSS-X) version 3.0 was used. The level of significance was set at .05 and the Scheffé method of multiple comparisons was used as a post hoc test to determine the differences between groups. The one way ANOVAs compared:

a) teachers and therapists

b) teachers with and without special education experience and therapists with and without school experience

c) teachers from schools with and without extensive special education programs and therapists with and without school experience.

d) teachers and therapists with less than, and greater than, ten years of experience in their respective fields.

CHAPTER IV

Results

Return Rates

Permission from superintendents and principals

Responses to the requests made to superintendents and principals for permission to contact teachers are summarized in Table 2. There were eight refusals in all. No reason was given for two, and for another two the refusal was unrelated to the investigation. Four respondents refused permission as they viewed the study as irrelevant because the schools were too small, the lack of OT services in the area made the survey unworthwhile, or the questions did not pertain to situations in their schools.

Table 2

Responses Regarding Permission to Participate

	Total	Permission refused	Permission granted	Percent granted
Superintendents				
no. of superintendents	34	6	28	82.4
potential respondents	454	106	348	76.7
Principals				
no. of principals	33	2	31	93.9
potential respondents	348	15	333	95.7

Questionnaire Returns

Questionnaires were returned from 27 of the 31 schools. Table 3 and Table 4 summarize the return rates. An assumption was made that if a respondent did not report years of experience, the teacher had more than one year of experience. This was based on the relatively small number of first year teachers at a school at any one time and on the small number of respondents who reported experience of less than a year.

Table 3

Summary of Questionnaire Returns

	Schools Without Extensive Sp. Ed. Programs	Schools With Extensive Sp. Ed. Programs	Total
(a) Potential no. of respondents	175	158	333
(b) Resp. < 1 yr. experience	3	2	5
(c) Eligible respondents (a - b)	172	156	328
(d) Returned questionnaires	69	67	136
(e) Blank questionnaires	9	18	27
(f) Unuseable questionnaires (b+e)	12	20	32
(g) Useable responses (d - f)	57	47	104
(h) Response rate [(d - b) ÷ c]	38.4%	41.7%	39.9%
(i) Useable response rate (g ÷ c)	33.2%	30.1%	31.7%

Table 4

Summary of Returns By Type of School and Teacher Experience

	Extensive Sp. Ed. Program	No Extensive Sp. Ed. Program	Total
With Sp. Ed. Experience	26	23	49
No Sp. Ed. Experience	19	30	49
Did Not State Experience	2	4	6
Total	47	57	104

Missing Data

The category of each item is given according to this key: (A) = activities of daily living, (C) = cognitive skills, (P) = psychosocial skills, (S) = sensorimotor skills, (T) = therapeutic adaptation/prevention. The number of missing scores for each item is listed in Appendix E. The only items which had no missing scores on either section of the scale were: 53. Is hyperactive, very restless. (C)

61. Is easily frustrated or discouraged. (P)

Cognitive and psychosocial skills are predominant among the items with least missing data, i.e., having no more than five missing scores on both sections of the scale (see table 5). The greatest number of missing scores were found for the items listed in Table 6 and in contrast, no cognitive or psychosocial skills appear on this list.

Several respondents gave reasons for not answering some items, and their comments echo the sense of remoteness or irrelevance that the superintendents and principals sometimes conveyed about the survey when they chose not to allow participation (Appendix F).

Table 5

Items With Least Missing Data

29. Holds pencil awkwardly; presses too hard or too lightly. (S)
45. Is awkward and large movements are clumsy. (S)
46. Has poorly developed sense of rhythm; can't play clapping games. (S)
52. Is easily distracted; has a short attention span. (C)
54. Has difficulty communicating events sequentially. (C)
56. Has difficulty classifying or categorizing objects. (C)
57. Has trouble applying concepts to a variety of situations. (C)
60. Has no strategy for solving simple problems. (C)
62. Does not express emotions or needs in socially appropriate ways; has no strategies for relieving stress and tension. (P)
64. Has difficulty communicating with peers or strangers. (P)
65. Does not recognize when he needs to change his behavior. (P)
66. Has difficulty with group participation; is uncooperative. (P)

Table 6

Items With Most Missing Data

Item	Missing scores
8. Habitually walks on toes. (S)	26
9. Needs help with use of wheelchair. (A)	24
16. Requires special adjustments to use a computer in class. (T)	23
32. When using one hand, tenses or moves the other. (S)	23
13. By age 8, has difficulty using a telephone. (A)	22
11. Does not have reciprocal arm & leg movements when walking. (S)	21
36. Sometimes makes no attempt to catch himself when falling. (S)	21
37. Has trouble holding head up when sitting. (S)	21
18. By age 8, has difficulty with simple homemaking tasks. (A)	20
38. Slumps to one side or slides forward in chair or wheelchair. (T)	19
39. Has a hard time keeping his balance; adjusts posture frequently. (S)	19

Length of Experience

The number of years of teaching experience ranged from 2 to 38 years with a mean of 12.5 years (*SD* = .7). The 49 educators who reported special education teaching experience had from 1 to 17 years with a mean of 2.1 years (*SD* = 3.4).

The therapists from the Magill-Evans and Madill (1990) study reported an average of 6.5 years experience in pediatric occupational therapy. Those with school experience were categorized according to type of work setting and the three groups had average school experience from 4.0 to 4.7 years (*SD* = 3.0 to 3.7)

Research Questions

Research question #1

Which of the potential screening instrument items do the teachers consider:

a) an important hindrance to students' ability to benefit from their educational program,

b) an important indicator for referral to personnel outside the classroom,

c) important both as a hindrance to education and an indicator for referral?

a) Items which the teachers considered to be important hindrances to a student's ability to benefit from their educational program.

The six items identified in boldface in Table 7 were rated by 70% or more of the teachers as frequently or always hindering a student's ability to benefit from their educational program. These six items, which can be considered to have received strong endorsement as hindrances to education, were from the psychosocial and cognitive domains. An additional 15 behaviors were considered to be important hindrances by at least 50% of the teachers (see Table 7).

Among the behaviors endorsed as important hindrances to education by 50% or more of the teachers the psychosocial and cognitive domains are particularly well represented. Each of the seven cognitive items and all but two of the ten psychosocial items were scored as important by at least 50% of the teachers on the impact part of the scale.

All items were endorsed at some level: 43 were below the 50% level and 13 of these items received less than 20% endorsement with two at less than 10%. The items can also be examined according to their rating as never indicating a need for referral and as never hindering a student from benefitting from their educational program as shown in Table 8. Note that the behavior descriptions retain the meaning of the originals but have been shortened.

Eleven items constitute those with the weakest endorsement by having met both minimum cut-off criteria. These items were scored as important by less than 20% of the teachers and were rated as unimportant by more than 20% of the teachers: 8, 9, 10, 11, 12, 13, 16, 17, 25, 28, 32. None are cognitive or psychosocial items.

This categorization leaves 31 items being modestly endorsed as important hindrance behaviors. They were scored 3 or 4 on the impact section of the scale by less than 50%, but scored 1 by less than 20% of the teachers.

Table 7

Items Scored by Teachers as Always or Often Hindering Students in Benefitting from Educational Programs

Item	Category	Percent
55. Can not repeat 3 words or numbers.	**C**	**80.8**
53. Is hyperactive, very restless.	**C**	**77.9**
62. Doesn't express emotions appropriately.	**P**	**73.1**
52. Is easily distracted; has a short attention span.	**C**	**73.1**
65. Doesn't recognize need to change behavior.	**P**	**71.1**
66. Difficulty with group participation; uncooperative	**P**	**70.2**
57. Trouble applying concepts to a variety of situations.	C	67.3
64. Difficulty communicating with peers or strangers.	P	66.4
61. Is easily frustrated or discouraged.	P	66.4
37. Has trouble holding head up when sitting.	S	65.4
54. Has difficulty communicating events sequentially.	C	65.4
1. Is unable to manage toileting.	A	64.4
60. Has no strategy for solving simple problems.	C	63.4
58. Does not recognize when help is needed.	P	61.5
63. Is unaware of other's feelings	P	60.6
56. Has difficulty classifying or categorizing objects.	C	58.6
38. Slumps/slides forward in chair or wheelchair.	T	56.8
3. Difficulty with swallowing, chewing, or drooling.	A	55.8
4. Needs assistance with self-feeding.	A	55.8
43. Has difficulties copying shapes, numbers, or letters.	S	53.8
22. Has difficulty taking turns, sharing or following rules.	P	51.0
41. Has difficulty copying from the blackboard.	S	49.0
34. Doesn't allow others nearby; upset by unexpected touch.	S	45.2
21. Rarely plays with other children; doesn't have friends.	P	45.2
39. Trouble keeping balance; often adjusts posture	S	43.3
49. Is confused about directional words	S	43.3
42. By age 8, still has number or letter reversals.	S	43.3
59. Can't identify strengths and limitations.	P	43.3
33. Loses place when reading; moves head.	S	43.3
5. Trouble changing clothes; difficulty with fastenings.	A	39.4
51. Is unable to draw a 6 part recognizable person with body.	S	37.5
44. Has trouble pasting one piece of paper on another.	S	37.5
30. By age 9, has difficulty spacing letters; is messy.	S	34.6
26. Has a splint or brace that interferes with class work.	T	32.7
23. Does not play age-appropriate games.	A	31.8
2. By age 10, is messy and unkempt.	A	30.8
48. By age 9, still confuses right & left on self or another.	S	29.8
40. Has difficulty with puzzles.	S	27.9
50. Has difficulty imitating simple body postures and movements; doesn't cross the body midline.	S	27.9
14. Has difficulty handling small items (e.g. coins, paper clips)	S	26.0
47. By age 7, switches hands during activities.	S	26.0
45. Is awkward and large movements are clumsy.	S	26.0

Item	Category	Percent
36. Sometimes makes no attempt to catch himself when falling.	S	25.0
24. Has extreme stiffness at any joint which limits function.	T	24.1
35. Appears to have poor overall body strength; is "floppy".	S	24.1
6. Has difficulty with stairs (holds bannister, 2 feet/step).	S	23.1
27. Has difficulty using scissors or cutting along a line.	S	23.1
7. Walks poorly with assistive devices.	T	22.1
31. When writing, doesn't stabilize paper.	S	22.1
18. By age 8, has difficulty with simple homemaking tasks.	A	21.2
29. Holds pencil awkwardly; presses too hard or too lightly.	S	20.1
9. Needs help with use of wheelchair.	A	19.2
28. Difficulty handling a ball.	S	19.2
12. Stumbles & falls more frequently than others his age.	S	17.3
46. Poor sense of rhythm; can't do clapping games.	S	17.3
11. Does not have reciprocal arm & leg movements when walking.	S	14.4
15. Has physical difficulties accessing a computer.	T	14.4
13. By age 8, has difficulty using a telephone.	A	13.5
16. Requires special adjustments to use a computer in class.	T	13.5
17. Has difficulty with doorknobs and faucets.	S	13.5
32. When using one hand, tenses or moves the other.	S	11.5
10. Can't hop, jump, or heel-toe walk.	S	10.6
25. Has too much movement in joints; seems double jointed.	S	8.7
8. Habitually walks on toes.	S	5.7

Note: All percentages were calculated as a percent of the total 104 respondents. For percentages of those who responded to each item, please see Appendix I.

Boldface denotes items which were scored 3 or 4 by more than 70% of respondents.

A = Activities of daily living
C = Cognitive
P = Psychosocial
S = Sensorimotor
T = Therapeutic adaptation/prevention

Table 8

Items Scored by Teachers as Never Being an Educational Hindrance and/or an Indicator for Referral

Item	Category	Referral %	Impact %
25. Too much movement in joints; double jointed.	**S***	**37.5**	**44.2**
31. When writing, doesn't stabilize paper.	**S***	**32.7**	**26.0**
29. Holds pencil awkwardly; presses too hard or lightly.	**S***	**31.7**	**20.2**
32. When using one hand, tenses/moves the other.	**S***	**29.8**	**26.9**
13. By age 8, difficulty using a telephone.	**A***	**24.0**	**30.8**
16. Requires adjustments to use computer in class.	**T***	**24.0**	**25.0**
15. Physical difficulty accessing computer.	**T**	**22.1**	**15.4**
46. Poor sense of rhythm; can't do clapping games	**S**	**22.1**	**16.3**
28. Difficulty handling a ball.	S*	18.3	20.2
30. By age 9, difficulty spacing letters; messy.	S	17.3	8.7
8. Habitually walks on toes.	S*	16.3	32.7
10. Can't hop, jump, or heel-toe walk.	S*	16.3	28.8
11. No reciprocal limb movements when walking.	S*	16.3	31.7
17. Difficulty with doorknobs and faucets.	S*	16.3	29.8
26. Splint or brace interferes with class work.	T	16.3	11.5
27. Difficulty using scissors.	S	16.3	14.4
48. By age 9, confuses right & left on self or another.	S	16.3	10.6
59. Can't identify strengths and limitations.	P	15.4	8.7
9. Needs help with use of wheelchair.	A*	14.4	22.1
49. Confused about directional words.	S	14.4	4.8
40. Difficulty with puzzles.	S	13.5	13.5
47. By age 7, switches hands during activities.	S	13.5	9.6
58. Doesn't recognize when help needed.	P	13.5	3.8
18. By age 8, difficulty with homemaking tasks.	A	12.5	19.2
44. Trouble pasting paper.	S	12.5	5.8
45. Awkward and large movements are clumsy.	S	12.5	8.7
33. Loses place when reading; moves head.	S	11.5	8.7
61. Is easily frustrated or discouraged.	P	11.5	2.9
12. Stumbles,falls more often than peers.	S*	10.6	22.1
14. Difficulty handling small items.	S	10.6	13.5
2. By age 10, is messy and unkempt.	A	9.6	9.6
34. Doesn't allow others nearby; upset by unexpected touch.	S	9.6	6.7
6. Difficulty with stairs.	S	8.7	19.2
41. Difficulty copying from blackboard.	S	8.7	4.8
50. Difficulty imitating postures; doesn't cross midline.	S	8.7	6.7
64. Difficulty communicating with peers/strangers.	P	8.7	2.9
23. Doesn't play age-appropriate games.	A	7.7	6.7
22. Difficulty taking turns, following rules.	P	6.7	3.8
42. By age 8, has number/letter reversals.	S	6.7	4.8
54. Difficulty communicating events sequentially.	C	6.7	1.0
57. Trouble applying concepts to a variety of situations.	C	6.7	1.9
60. No strategy for solving simple problems.	C	6.7	2.9

Item	Category	Referral %	Impact %
5. Trouble changing clothes; difficulty with fastenings.	A	5.8	9.6
7. Walks poorly with assistive devices.	T	5.8	17.3
24. Extreme stiffness at a joint which limits function.	T	5.8	11.5
35. Poor overall body strength; is "floppy".	S	5.8	10.6
36. Makes no attempt to catch self when falling.	S	5.8	14.4
63. Unaware of other's feelings.	P	5.8	1.9
3. Difficulty swallowing, chewing, or drooling.	A	4.8	5.8
21. Rarely plays with other children; lacks friends.	P	4.8	4.8
39. Trouble keeping balance; often adjusts posture.	S	4.8	8.7
43. Difficulty copying shapes, numbers, or letters.	S	4.8	2.9
51. Unable to draw 6 part person with body.	S	4.8	4.8
53. Is hyperactive, very restless.	C	4.8	2.9
56. Difficulty categorizing objects.	C	4.8	1.0
62. Doesn't express emotions appropriately.	P	4.8	1.0
66. Difficulty with group participation; uncooperative.	P	4.8	1.9
4. Needs assistance with self-feeding.	A	3.8	5.8
38. Slumps/slides forward in chair or wheelchair.	T	3.8	7.7
52. Easily distracted; short attention span.	C	3.8	26.0
65. Doesn't recognize need to change behavior.	P	3.8	1.0
1. Unable to manage toileting.	A	2.9	5.8
37. Trouble holding head up when sitting.	S	1.9	3.8
55. Can't repeat 3 words or numbers.	C	1.0	14.4

Note: Boldface denotes items which 20% or more of the teachers scored 1 on the referral section of the scale.

An asterisk denotes items which 20% or more of the teachers scored 1 on the impact section of the scale.

All percentages are calculated as a percent of the total 104 respondents. For percentages of those who responded to each item, please see Appendix I.

A = Activities of daily living
C = Cognitive
P = Psychosocial
S = Sensorimotor
T = Therapeutic adaptation/prevention

b) Items which the teachers considered to be important indicators for referral to personnel outside the classroom.

The six items identified in boldface in Table 9 were scored by 70% or more of the teachers as important referral items and can be considered to have received strong endorsement. These important referral items were from all categories except therapeutic adaptation/prevention. An additional ten behaviors were considered important referral indicators by at least 50% of the teachers (see Table 9) and all categories of items are represented at this level of endorsement.

As with the scoring on the impact section of the scale, every item received some level of endorsement. A modest level of endorsement as important referral indicators was given to 43 behaviors which were considered important by fewer than 50% of the teachers and scored as unimportant by less than 20%.

Items in the referral section with the weakest level of endorsement can be established by referring to Tables 8 and 9. Of the six items having less than 20% of the teachers giving them a score of 3 or 4, five were further indicated as being unimportant referral items by having more than 20% giving them a score of 1. These most weakly endorsed reasons for referral were: 25, 29, 31, 32, 46. All are in the sensorimotor domain.

Table 9

Items Scored by Teachers as Always or Often Being an Educational Hindrance and/or Indicator for Referral

Item	Category	Referral %	Impact %
37. Trouble holding head up when sitting.	**S**	**75.9**	**65.4**
55. Can't repeat 3 words or numbers.	**C ***	**74.1**	**80.8**
1. Unable to manage toileting.	**A**	**73.1**	**64.4**
4. Needs assistance with self-feeding.	**A**	**72.1**	**55.8**
62. Doesn't express emotions appropriately.	**P***	**72.1**	**73.1**
3. Difficulty with swallowing, chewing, or drooling.	**A**	**70.2**	**55.8**
53. Is hyperactive, very restless.	C*	67.3	77.9
38. Slumps or slides forward in chair or wheelchair.	T	64.5	56.8
52. Easily distracted; short attention span.	C*	64.5	73.1
65. Doesn't recognize need to change behavior.	P*	62.5	71.1
63. Unaware of other's feelings.	P	59.6	60.6
66. Difficulty with group participation; uncooperative.	P*	58.6	70.2
34. Doesn't allow others nearby; upset by unexpected touch.	S	55.7	45.2
39. Trouble keeping balance; often adjusts posture.	S	53.8	44.2
64. Difficulty communicating with peers/strangers.	P	52.9	66.4
5. Trouble changing clothes;difficulty with fastenings.	A	51.9	39.4
42. By age 8, has number/letter reversals.	S	49.0	43.3
43. Difficulty copying shapes, numbers, or letters.	S	49.0	53.8
54. Difficulty communicating events sequentially.	C	49.0	65.4
56. Difficulty categorizing objects.	C	48.1	58.6
60. No strategy for solving simple problems.	C	48.1	63.4
57. Trouble applying concepts to a variety of situations.	C	47.1	67.3
61. Is easily frustrated or discouraged.	P	47.1	66.4
21. Rarely plays with other children; lacks friends.	P	46.1	45.2
36. Makes no attempt to catch self when falling.	S	46.1	25.0
51. Unable to draw 6 part person with body.	S	45.2	37.5
41. Difficulty copying from blackboard.	S	43.3	49.0
22. Difficulty taking turns, following rules.	P	40.4	51.0
58. Doesn't recognize when help needed.	P	40.4	61.5
6. Difficulty with stairs.	S	39.5	23.1
49. Confused about directional words.	S	38.5	43.3
7. Walks poorly with assistive devices.	T	37.5	22.1
35. Poor overall body strength; is "floppy".	S	37.5	24.1
33. Loses place when reading; moves head.	S	37.5	43.3
9. Needs help with use of wheelchair.	A	36.6	19.2
44. Trouble pasting paper.	S	36.5	39.4
26. Splint or brace interferes with class work.	T	35.6	32.7
24. Extreme stiffness at a joint which limits function.	T	35.6	24.1
50. Difficulty imitating postures; doesn't cross midline.	S	31.8	27.9
12. Stumbles, falls more often than peers.	S	31.8	17.3
48. By age 9, confuses right & left on self or another.	S	30.8	29.8
2. By age 10, is messy and unkempt.	A	30.8	30.8
59. Can't identify strengths and limitations.	C	30.8	43.3

Item	Category	Referral	Impact
		%	%
23. Doesn't play age-appropriate games.	A	29.8	31.8
30. By age 9, difficulty spacing letters; messy.	S	29.8	34.6
18. By age 8, difficult with homemaking tasks.	A	29.8	21.2
14. Difficulty handling small items.	S	27.9	26.0
40. Difficulty with puzzles.	S	27.9	27.9
16. Requires adjustments to use computer in class.	T	26.0	13.5
47. By age 7, switches hands during activities.	S	26.0	26.0
45. Awkward and large movements are clumsy.	S	30.8	26.0
11. No reciprocal limb movements when walking.	S	26.0	14.4
13. By age 8, difficulty using a telephone.	A	25.9	13.5
27. Difficulty using scissors.	S	25.0	23.1
15. Physical difficulty accessing computer.	T	23.1	14.4
17. Difficulty with doorknobs and faucets.	S	23.1	13.5
10. Can't hop, jump, or heel-toe walk.	S	22.1	10.6
8. Habitually walks on toes.	S	20.2	5.7
25. Too much movement in joints; double jointed.	S	19.2	8.7
28. Difficulty handling a ball.	S	17.3	19.2
46. Poor sense of rhythm; can't do clapping games.	S	15.3	17.3
29. Holds pencil awkwardly; presses too hard/lightly	S	16.3	20.1
31. When writing, doesn't stabilize paper.	S	14.4	22.1
32. When using one hand, tenses or moves the other.	S	12.5	11.5

Note: Bold face denotes items which 70% or more of the teachers scored 3 or 4 on the referral section of the scale.

An asterisk denotes items which 70% or more of the teachers scored 3 or 4 on the impact section of the scale.

All percentages are a percent of the total 104 respondents. For percentages of those who responded to each item, please see Appendix I.

A = Activities of daily living
C = cognitive
P = Psychosocial
S = Sensorimotor
T = Therapeutic adaptation/prevention

c) Items considered by teachers to be important both as hindrances to education and indicators for referral.

Two items were considered important by 70% of the teachers on both parts of the scale:

55. Can not repeat 3 words or numbers. (C)

62. Doesn't express emotions appropriately. (P)

The items which received an endorsement by 70% of the teachers on one section of the scale, also were scored as important by at least 55% on the other section. This group of eight items, in addition to 55 and 62 noted above, are either in boldface or marked with an asterisk in Table 9. Together these ten items can be considered the most strongly endorsed items on both parts of the scale. Moreover, items 38, 63, and 64, were scored as important by at least 50% of the teachers on each part of the scale which adds three behaviors which can be considered to have good endorsement.

At the other extreme, four items were scored 3 or 4 by less than 20% of the teachers on each part of the scale (Table 9). Two of these, 25 and 32, were also scored unimportant by more than 20% of the teachers on each part of the scale (see Table 8) and can be considered the most weakly endorsed on both parts of the scale.

Items with modest endorsement are those not included in the above categories. With ten items important on both parts of the scale, three more at the 50% level of endorsement, and two items which are quite unimportant, 49 behaviors emerge as having a modest importance to the teachers when both parts of the scale are considered.

Research Question #2

Which items do teachers with and without special education experience agree are important hindrances to learning and/or indicators for referral? On which items do their opinions differ?

Two items were rated as important by teachers with and without special education experience as educational hindrances and indicators for referral: 55 (cognitive) and 62 (psychosocial). Items 52 and 53 were considered important impact behaviors by both groups and though not receiving endorsement as referral items at the 70% level, they were considered important by at least 65% of both teacher groups. Items 3 and 37 were considered important referral items by both groups and were endorsed by at least 50% of each teacher group on the impact part of the scale. These items can

therefore be considered as those most strongly endorsed by the teachers with and without special education experience.

The remaining items in Table 10 were not strongly endorsed. Nevertheless, items 1, 4, 65, and 66 were scored 3 or 4 by at least 50% of teachers. These can also be viewed as important items on which there was general agreement between both groups of teachers.

No strong difference of opinion about items rated as important is evident. Items endorsed as important by one group of teachers on a section of the scale were also important to at least 20% in each subgroup. Nor was any item with a 70% endorsement scored as unimportant on either part of the scale by more than 20% of either teacher group (see Tables 10 and 11).

Determining the most unimportant items can be done by viewing Table 11. Twenty percent or more of both teacher groups scored three items as never being educational hindrances or referral indicators: 16, 25, 31. These items did not meet both criteria for the weakest endorsement category since they were rated as important on at least one section of the scale by more than 20% of the scorers. No items rated as unimportant came from the cognitive domain.

The psychosocial category is represented by item 58 which met the 20% cut-off in one of the three scoring divisions but was scored as unimportant by less than 10% of the teachers in each subgroup.

When rating the unimportant items, teachers without special education experience identified roughly three times as many items as those with a special education background. The scoring of important items, by contrast, was done quite similarly by the two groups.

Table 10

Items Scored 3 or 4 by 70% of Teachers With Different Experience

	Referral			Impact		
Experience	Item	No.	%	Item	No.	%
Teachers With Special Education Experience $n = 49$	1 (A)	37	75.5			
	3 (A)	35	71.4			
	37 (S)	35	71.4			
				52 (C)	37	75.5
				53 (C)	39	79.6
	55 (C)	**36**	**73.5**	**55 (C)**	**40**	**81.6**
				61 (C)	35	71.4
	62 (P)	**36**	**73.5**	**62 (P)**	**36**	**73.5**
				64 (C)	37	75.5
	65 (P)	35	71.4	65 (C)	37	75.5
Teachers Without Special Education Experience $n = 49$				1 (A)	37	75.5
	3 (A)	35	71.4			
	4 (A)	36	73.5			
	37 (S)	39	79.6			
				52 (C)	36	73.5
				53 (C)	38	77.5
	55 (C)	**35**	**71.4**	**55 (C)**	**39**	**79.6**
	62 (P)	**35**	**71.4**	**62 (P)**	**37**	**75.5**
				66 (P)	35	71.4

Note: Boldface denotes items scored as important (3 or 4) by 70% of both groups on both sections of the scale.

Table 11

Items Scored 1 by 20% or More of Teachers With Different Experience

	Referral			Impact		
Experience	Item	No.	%	Item	No.	%
Teachers With Special Education Experience n = 49				11 (S)	12	24.5
				13 (A)	10	20.4
	16 (T)	**12**	**24.5**	**16 (T)**	**12**	**24.5**
				17 (S)	14	28.6
	25 (S)	**14**	**28.6**	**25 (S)**	**19**	**38.8**
	29 (S)	13	26.5			
	31 (S)	**12**	**24.5**	**31 (S)**	**12**	**24.5**
	32 (S)	10	20.4			
Teachers Without Special Education Experience n = 49				7 (T)	12	24.5
	8 (S)	11	22.4	8 (S)	23	46.9
	9 (A)	10	20.4	9 (A)	14	28.6
				10 (S)	16	32.7
	11 (S)	10	20.4	11 (S)	19	38.8
				12 (S)	13	26.5
	13 (A)	14	28.6	13 (A)	19	38.8
	15 (T)	11	22.4	15 (T)	10	20.4
	16 (T)	**12**	**24.5**	**16 (T)**	**12**	**24.5**
				17 (S)	14	28.6
				18 (A)	10	20.4
	25 (S)	**23**	**46.9**	**25 (S)**	**25**	**51.0**
	26 (T)	10	20.4			
	27 (S)	11	22.4			
	28 (S)	10	20.4	28 (S)	10	20.4
	29 (S)	17	34.7	29 (S)	13	26.5
	31 (S)	**19**	**38.8**	**31 (S)**	**12**	**24.5**
	32 (S)	17	34.7	32 (S)	14	28.6
	46 (S)	13	26.5	46 (S)	10	20.4
	48 (S)	12	24.5			
	49 (S)	12	24.5			
	58 (P)	10	20.4			

Note: Boldface denotes items scored as unimportant (1) by 20% or more of both groups on both sections of the scale.

Research Question #3

Which items do teachers from schools with extensive special educational programming and those from schools without such programming agree are important hindrances to learning and/or indicators for referral? On which items do their opinions differ?

No item was scored as important by both groups of teachers on both sections of the scale (see Table 12). Items 52, 53, and 55 were rated as important hindrances to learning and were scored 3 or 4 by at least 61% on the referral section of the scale. Items 1, 3, and 37 were rated as important on the referral section and were considered important educational hindrances by at least 50% of each teacher group. These six items were the most strongly endorsed items by teachers from schools with and without extensive special educational programming. Additionally, items 4, 62, 64, 65, and 66 from Table 12 received general agreement as to their importance by both groups, being scored 3 or 4 by at least 50% of teachers in each subgroup.

The behaviors rated as important hindrances to learning were from the cognitive and psychosocial domains. The scoring of items as important referral indicators was more mixed with items identified from all categories except therapeutic adaptation/prevention

Great differences of opinion between the teacher groups about items rated as important were not evident. Items endorsed as important by one group on a section of the scale were also supported by at least 20% of the teachers in each subgroup. Similarly, behaviors that received a 70% level of endorsement were not rated as unimportant by more than 20% of either teacher group on either section of the scale (see Table 13).

Items rated as unimportant by 20% or more of both groups of teachers on both sections of the scale were: 13, 16, 25, 31, and 32. Item 32 also fit the criteria for the most weakly endorsed items by having less than 20% of either group of teacher scoring it 3 or 4 on either part of the scale. The cognitive and psychosocial categories were not represented among the items rated unimportant.

Table 12

Items Scored 3 or 4 by 70% of Teachers From Two Types of Schools

	Referral			Impact		
School Type	Item	No.	%	Item	No.	%
Teachers from Schools With Extensive Special Education Programs $n = 47$	1 (A)	33	70.2			
	3 (A)	33	70.2			
	37(S)	33	70.2			
				52 (C)	34	72.3
				53 (C)	34	72.3
				55 (C)	33	70.2
Teachers from Schools Without Extensive Special Education Programs $n = 57$	1 (A)	43	75.5			
	3 (A)	40	70.2			
	4 (A)	44	77.2			
	37 (S)	46	80.7			
				52 (C)	42	73.7
	53 (C)	41	71.9	53 (C)	47	82.5
				54 (C)	42	73.7
	55 (C)	46	80.7	55 (C)	51	89.4
				61 (P)	40	70.2
	62 (P)	43	75.5	62 (P)	46	80.7
	64 (P)	43	75.5	64 (P)	43	75.4
	65 (P)	45	78.9	65 (P)	45	78.9
	66 (P)	47	82.4	66 (P)	47	82.4

Table 13

Items Scored 1 by 20% or More Teachers From Two Types of Schools

	Referral			Impact		
School Type	Item	No.	%	Item	No.	%
Teachers from Schools With Extensive Special Education Programs $n = 47$				8 (S)	14	29.8
				9 (A)	12	25.5
				10 (S)	14	29.8
				11 (S)	17	36.2
	13 (A)	**11**	**23.4**	**13 (A)**	**14**	**29.8**
	16 (T)	**10**	**21.3**	**16 (T)**	**12**	**25.5**
				17(S)	16	34.0
				18 (A)	10	21.3
	25 (S)	**12**	**25.5**	**25 (S)**	**19**	**40.4**
				26 (S)	10	21.3
				28 (S)	11	23.4
	29 (S)	11	23.4			
	31 (S)	**12**	**25.5**	**31 (S)**	**13**	**27.7**
	32 (S)	**10**	**21.3**	**32 (S)**	**13**	**27.7**
				40 (S)	10	21.3
	46(S)	10	21.3			
Teachers from Schools Without Extensive Special Education Programs $n = 57$				6 (S)	12	21.1
				8 (S)	20	35.1
				10 (S)	16	28.1
				11 (S)	16	28.1
				12 (S)	16	28.1
	13 (A)	**14**	**24.6**	**13 (A)**	**18**	**31.6**
	15 (T)	15	26.3			
	16 (T)	**15**	**26.3**	**16 (T)**	**14**	**24.6**
				17 (S)	15	26.3
	25 (S)	**27**	**47.4**	**25 (S)**	**27**	**47.4**
	28 (S)	12	21.1			
	29 (S)	18	24.6	29 (S)	12	21.1
	31 (S)	**22**	**38.6**	**31 (S)**	**14**	**24.6**
	32 (S)	**21**	**36.8**	**32 (S)**	**15**	**26.3**
	46 (S)	13	22.8			

Note: Boldface denotes items scored as unimportant (1) by 20% or more of both groups of teachers on both sections of the scale

Table 14 summarizes the items which 70% of the teachers scored as frequently or always indicating a need for referral and as frequently or always being a hindrance to students benefitting from their educational programs.

Table 14

Items Considered Important by Teachers

	Referral		Impact	
All teachers	1 (A) toileting 3 (A) swallowing 4 (A) self-feeding 37 (S) hold head up 55 (C) repeat 3 words 62 (P) express emotions		52 (C) distractible 53 (C) hyperactive 55 (C) repeat 3 words 62 (P) express emotions 65 (P) see need to change behavior 66 (P) uncooperative	
Teachers with Sp. Ed. Experience	1 (A) 3 (A) 37 (S)	55 (C) 62 (P) 65 (P)	61 (P) easily frustrated 64 (P) communication 52 (C) 53 (C) 55 (C)	62 (P) 65 (P)
Teachers without Sp. Ed. Experience	3 (A) 4 (A) 37 (S)	55 (C) 62 (P)	1 (A) 52 (C) 53 (C)	55 (C) 62 (P) 66 (P)
Teachers from Schools with Extensive Special Programs	1 (A) 3 (A) 37 (S)		52 (C) 53 (C) 55 (C)	
Teachers from Schools without Extensive Special Programs	1 (A) 3 (A) 4 (A) 37 (S) 53 (C)	55 (C) 62 (P) 64 (P) 65 (P) 66 (P)	52 (C) 53 (C) 54 (C) 55 (C) 61 (P)	62 (P) 64 (P) 65 (P) 66 (P)

Note: Items are given a verbal description when they first appear in the table.

Research Question #4

Which items do teachers and occupational therapists agree constitute reasons for referral? On which items do their opinions differ?

Some general trends in the scoring of the items should be noted here because they pertain to the overall patterns of agreement and disagreement between the items scored by therapists and teachers: (a) more items were scored as important by therapists than teachers, (b) fewer items were scored as unimportant by therapists than teachers, and (c) the items were held to be important by a greater proportion of therapists, and unimportant by a greater proportion of teachers. The differences in the scoring of important items are clearly seen in Figure 1.

Five times as many items were scored as frequently or always being indicators for referral by the therapists in the Magill-Evans and Madill (1990) study as by the teachers in this study. Six items were endorsed by 70% or more of the teachers as important referral indicators; 31 items were endorsed by the therapists (see Table 9 and Table 15). Only one item was scored as an important referral indicator by more than 80% of the teachers, whereas 16 were scored as important by over 80% of therapists, three of these items being endorsed by over 90% of OTs.

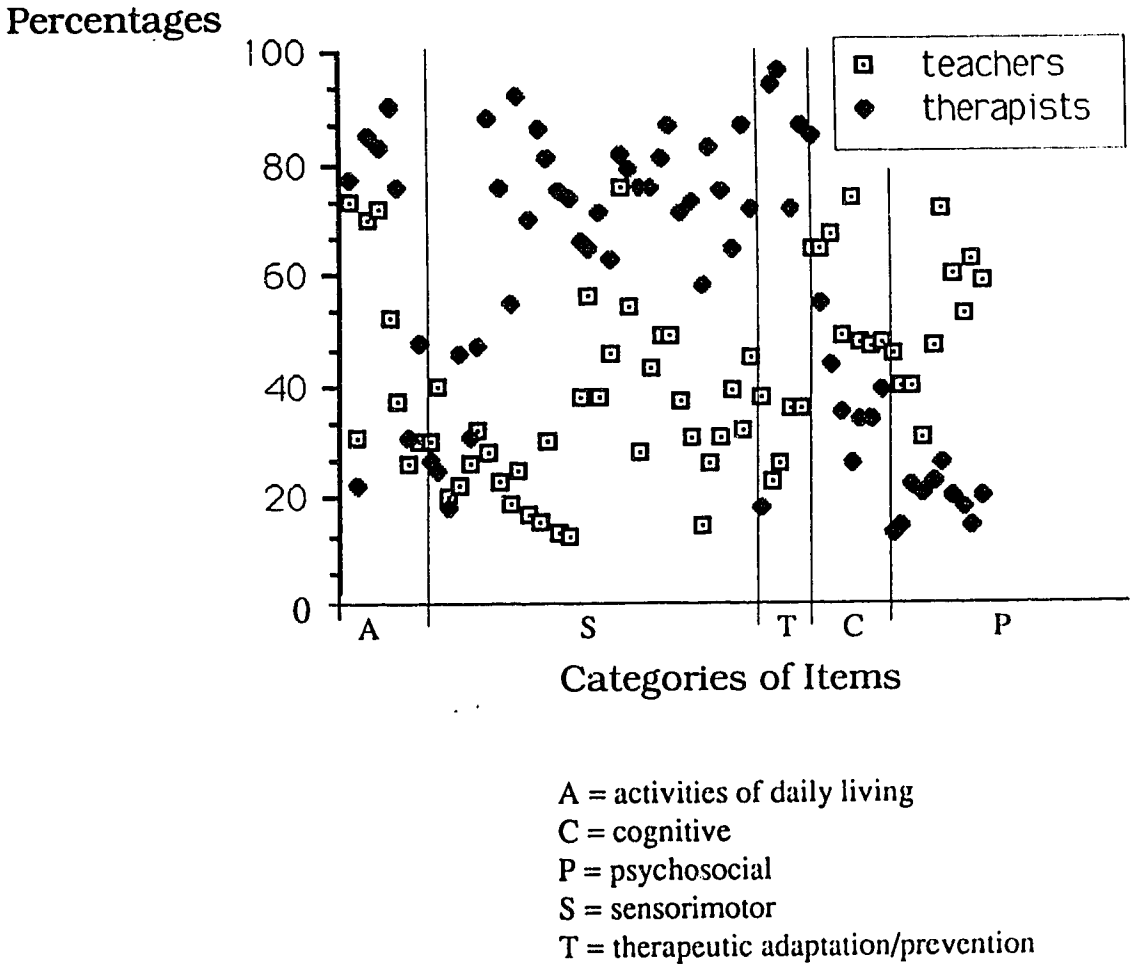

Figure 1. Percentage of Therapists and Teachers Scoring Items as Always or Often Indicating Need for Referral.

Table 15

Items Scored by Therapists as Always or Often Indicating Need for Referral to Occupational Therapy

Percent		Item
96.9	16.	Needs special adjustments to use a computer.
93.8	15.	Physical difficulties in accessing a computer.
91.7	27.	Difficulty using scissors.*
89.6	5.	Trouble changing clothes, difficulty with fastenings.*
88.0	14.	Difficulty handling small items.
87.0	26.	Has a splint/brace that interferes with class work.
87.0	43.	Has difficulty copying shapes, numbers, or letters.
87.0	50.	Difficulty imitating body movements; doesn't cross midline.
86.4	29.	Holds pencil awkwardly; presses too hard or too lightly.*
85.4	3.	Difficulty with swallowing, chewing, or drooling.*
85.4	38.	Slumps to one side, slides forward in chair/ wheelchair.
83.3	4.	Needs assistance with self-feeding.*
82.8	47.	By age 7, switches hands during activities.*
82.3	37.	Has trouble holding head up when sitting.*
80.6	30.	By age 9, has difficulty spacing letters.*
80.6	42.	By age 8, still has number/letter reversals or inversions.*
79.2	39.	Trouble keeping balance; readjusts posture frequently.*
76.6	1.	Unable to manage toileting.*
76.0	17.	Has difficulty with doorknobs & faucets.
76.0	41.	Has difficulty copying from the blackboard.*
75.8	9.	Needs help with use of wheelchair.*
75.5	40.	Has difficulty with puzzles.
75.0	31.	When writing, doesn't stabilize the paper.
74.5	48.	By age 9, confuses right & left on self or another person.*
74.0	32.	When using one hand, tenses or moves the other.
73.4	45.	Is awkward, and large movements are clumsy.
72.4	51.	Is unable to draw a 6 part recognizable person.
72.3	24.	Has extreme tightness which limits joint function.
71.4	35.	Appears to have poor overall body strength; is "floppy".*
70.8	44.	Has trouble pasting one piece of paper on another.*
70.3	28.	Difficulty bouncing, throwing, or catching a large ball.*
66.2	33.	Loses place when reading; moves head when reading.
64.9	34.	Is upset by unexpected touch; doesn't like others nearby.
64.6	49.	Confused about meaning of directional words.
62.5	36.	Makes no attempt to catch himself when falling.
58.3	46.	Poorly developed sense of rhythm; can't play clapping games.
54.7	52.	Easily distracted; has short attention span.
54.5	25.	Too much movement in joints; seems double-jointed.
47.9	18.	By age 8, has difficulty with simple homemaking tasks.
47.4	12.	Stumbles, falls more frequently than others the same age.
46.4	10.	Cannot heel-toe walk, hop on one foot, jump in place.
44.3	53.	Is hyperactive, very restless.
39.1	60.	Has no strategy for simple problem solving.
34.9	54.	Has difficulty communicating events sequentially.
34.4	56.	Has difficulty classifying or categorizing objects.
33.9	57.	Has trouble applying concepts to a variety of situations.
30.9	11.	Lacks reciprocal arm and leg movements when walking.
30.5	13.	Difficulty using telephone by age 8.
27.1	23.	Doesn't play age-appropriate games.
26.0	62.	Doesn't express emotions in appropriate ways.
25.5	55.	Can't repeat three words or numbers.
25.0	6.	Difficulty with stairs.
22.9	61.	Is easily frustrated or discouraged.
22.4	58.	Doesn't recognize when help is needed.
21.9	2.	Little attention to appearance.
21.5	20.	By high school, lacks basic job acquisition skills.
21.4	19.	By high school, has unrealistic career plans.
21.4	59.	Cannot identify his/her strengths & limitations.
20.3	63.	Unaware of others' feelings/needs.
19.5	66.	Has difficulty with group participation; is uncooperative.
18.3	8.	Habitually walks on toes.
17.7	7.	Walks poorly with assistive devices.
17.7	64.	Has difficulty communicating with peers or strangers.
15.1	22.	Difficulty taking turns or following rules.
15.1	65.	Does not recognize when needs to change behaviour.
13.5	21.	Rarely plays with other children; lacks friends.

* Similar items identified in Daffner's (1987) study by over 70% of therapists.

Note. From "Occupational Therapy in Schools: Identifying Items for a Referral Instrument" by J. Magill-Evans and H. Madill, 1990, *Canadian Journal of Occupational Therapy, 57*, p. 136. Reprinted by permission.

Table 8 and Table 16 show the items which received scores of 1 or of never indicating a need for referral. All items were rated as unimportant by some of the teachers but only 23 of the items on this study's questionnaire were scored as unimportant by the therapists. No item from this questionnaire was scored as unimportant by more than 20% of the therapists but eight items on the referral section (and 13 items on the impact section) of the scale were scored as never indicating a need for referral by more than 20% of the teachers.

Table 16

Items Scored by Therapists as Never Indicating Need for Referral to Occupational Therapy

Percent		Item
~~21.5~~	~~20.~~	~~By high school, lacks basic job acquisition skills. (A)~~
~~20.0~~	~~19.~~	~~By high school, has unrealistic career plans.(P)~~
19.8	65.	Does not recognize when he needs to change behaviour.(P)
18.8	63.	Unaware of others' feelings/nee .(P)
18.2	22.	Difficulty taking turns or following rules.(P)
17.7	58.	Doesn't recognize when help is needed (P)
17.7	59.	Cannot identify his/her strengths & limitations.(P)
17.7	64.	Difficulty communicating with peers or strangers.(P)
16.7	13.	Difficulty using telephone by age 8.(A)
16.1	21.	Rarely plays with other children; lacks friends.(P)
15.6	66.	Difficulty with group participation; is uncooperative. (P)
14.1	8.	Habitually walks on toes.(S)
13.5	2.	Little attention to appearance.(A)
12.5	18.	By age 8, has difficulty with simple homemaking tasks.(A)
12.5	23.	Doesn't play age-appropriate games.(A)
12.0	62.	Doesn't express emotions in appropriate ways.(P)
10.9	11.	Lacks reciprocal arm and leg movements when walking.(S)
10.4	61.	Is easily frustrated or discouraged.(P)
8.9	57.	Has trouble applying concepts to a variety of situations. (C)
8.3	55.	Can't repeat three words or numbers. (C)
7.8	56.	Has difficulty classifying or categorizing objects.(C)
7.3	7.	Walks poorly with assistive devices.(T)
6.8	10.	Cannot heel-toe walk, hop on one foot, jump in place.(S)
6.8	54.	Has difficulty communicating events sequentially.(C)
6.3	25.	Too much movement in joints; seems double-jointed.(S)

A= activities of daily living
C= cognitive items
P= psychosocial items
S= sensorimotor items
T= therapeutic adaptation/ prevention items

Note. From "Occupational Therapy in Schools: Identifying Items for a Referral Instrument" by J. Magill-Evans and H. Madill, 1990, *Canadian Journal of Occupational Therapy, 57*, p. 137. Reprinted by permission.

Now to consider research question #4 more directly. Four items were scored as always or frequently indicating a need for referral by 70% of the teachers in this study and 70% of the therapists in the Magill-Evans and Madill (1990) study. These were the only items to meet the 70% criterion of both respondent groups:

1. Is unable to manage toileting. (A)
3. Has difficulty with swallowing, chewing, drinking, or drooling. (A)
4. Needs assistance with self-feeding or is exceptionally sloppy. (A)
37. Has trouble holding head up when sitting. (S)

Five items were endorsed by 50% of respondents in each study:

5. Has trouble putting on clothes & changing; has difficulty with fastenings. (A)
34. Doesn't allow others to be nearby when working; is upset by unexpected touch. (S)
38. Slumps to one side or slides forward in chair or wheelchair. (T)
39. Has a hard time keeping his balance; readjusts posture frequently. (S)
52. Is easily distracted; has a short attention span. (C)

The most agreement between teachers and therapists about items of the most importance was achieved by the group of nine items noted above. Of these, items 1, 3, 4, 5, 37, and 39 were also identified by over 70% of the respondents in Daffner's (1987) study. Table 17 is a summary of agreement between teachers and therapists for all the items as being reasons for referral.

Table 17

Agreement of Items Scored as Indicators for Referral by Teachers and Therapists

Agreement/Endorsement Category with Minimum Criteria	Item	% Giving Item Score of 3 or 4 (also high % scoring 1)	
		Teachers	Therapists
Very strong agreement re: important referral indicators. 70% of each group score item 3 or 4.	3 (A)	70.2	85.4
	4 (A)	72.1	83.3
	37 (S)	75.9	82.3
	1 (A)	73.1	76.6
Strong agreement. One group has 70%, other group 50% scoring item 3 or 4.	5 (A)	51.9	89.6
	38 (S)	64.5	85.4
	39 (S)	53.8	79.2
Agreement. 50% of both groups score item 3 or 4.	34 (S)	55.7	64.9
	52 (C)	64.5	54.7

Agreement/Endorsement Category with Minimum Criteria	Item	% Giving Item Score of 3 or 4 (also high % scoring 1)	
		Teachers	Therapists
Some agreement for items being important indicators for referral. In one group at least 50%, in other group 20% score item 3 or 4.	27 (S)	25.0	91.7
	14 (S)	27.9	88.0
	43 (S)	49.0	87.0
	26 (T)	35.6	87.0
	50 (S)	31.8	87.0
	47 (S)	26.0	82.7
	42 (S)	49.0	80.6
	30 (S)	29.8	80.6
	41 (S)	43.3	76.0
	17 (S)	23.1	76.0
	9 (A)	36.6	75.8
	40 (S)	27.9	75.5
	48 (S)	30.8	74.5
	55 (S)	74.1	25.5
	45 (S)	30.8	73.4
	51 (S)	45.2	72.4
	24 (T)	35.6	72.3
	62 (P)	72.1	26.0
	35 (S)	37.5	71.2
	44 (S)	36.5	70.8
	53 (C)	67.3	44.3
	33 (S)	37.7	66.2
	49 (S)	38.5	64.6
	36 (S)	46.1	62.5
	63 (P)	59.6	20.3

Agreement/Endorsement Category with Minimum Criteria	Item	% Giving Item Score of 3 or 4 (also high % scoring 1)	
		Teachers	Therapists
Weak endorsement by both groups. Less than 50% of both groups scored item 3 or 4.	54 (C)	49.0	34.9
	60 (C)	48.1	39.1
	56 (C)	48.1	34.4
	18 (A)	29.8	47.9
	12 (S)	31.7	47.4
	57 (C)	47.1	33.9
	61 (P)	47.1	22.9
	10 (S)	22.1	46.4
	21 (P)	46.1	13.5
	58 (P)	40.4	22.4
	22 (P)	40.4	15.1
	6 (S)	39.5	25.0
	7 (T)	37.5	17.7
	11 (S)	26.0	30.9
	2 (A)	30.8	21.9
	59 (C)	30.8	21.4
	13 (A)	25.9 (1 = 24.0)	30.5
	23 (A)	29.8	27.1
	8 (S)	20.2	18.3
Some Disagreement. 50% or more of one group, and less than 20% of the other group scored item 3 or 4.	65 (P)	62.5	15.1 (1 = 19.8)
	66 (P)	58.6	19.5
	46 (S)	15.3	58.3
	25 (S)	19.2 (1 = 37.5)	54.5
	64 (P)	52.9 (1 = 22.1)	17.7 (1 = 17.7)
Disagreement. 70% or more of one group scored item 3 or 4. Other group scored item 3 or 4 by less than 20%, or scored 1 or "never " by more than 20%.	15 (T)	23.1 (1 = 22.1)	96.9
	16 (T)	26.0 (1 = 24.0)	93.8
	28 (S)	17.3	70.3

Agreement/Endorsement Category with Minimum Criteria	Item	% Giving Item Score of 3 or 4 (also high % scoring 1)	
		Teachers	Therapists
Strong Disagreement. 70% or more of one group scored item 3 or 4. Other group scored item 3 or 4 by less than 20% and scored item "never" or 1 by more than 20%.	29 (S)	16.3 (1 = 31.7)	86.4
	31 (S)	14.4 (1 = 32.7)	75.0
	32 (S)	12.5 (1 = 29.8)	74.0

Note: Some percentages of the score 1 are given despite being less than 20% because they matched or exceeded the percentages of the scores 3 or 4 .

In several cases there were large differences between the percentage of teachers and therapists who rated an item as important (see Table 17). Items were not designated as generating disagreement on the basis of this kind of difference however, but on whether or not the proportion of scorers met certain cut-off criteria. As stated in Chapter III, the goal of the comparisons was to establish the items upon which the groups agreed without losing sight of the importance given to an item by either one of the groups. Taking item 62 as an example, the difference in percentages was quite large (72.1 & 26.0). The higher number met the criterion for being considered a strong endorsement by being over 70%, but the lower one did not fit the criterion for very poor endorsement because it was above the 20% cut-off. Since both groups could be considered to have endorsed the item to some extent, this behavior was in the "some agreement" classification rather than one of the "disagreement" groups, despite the large difference in percentages of respondents scoring the item as important.

A difference of opinion which is related to this research question concerns the items identified as important by the teachers on the impact section of the scale. Seventy percent or more of the teachers endorsed six items as important hindrances to a student's education. Though only two of these were also important as referral items at the 70% level, they all were nevertheless in the top 12 important referral items, endorsed by at least 58% of the teachers. None of these six important impact items (and to a lesser extent important referral items too) identified by the teachers were considered by 70% or more of the therapists to be important reasons for referral. This

is despite the therapist list of important referral items being 31 items long and including almost half of all the items. The behaviors were cognitive and psychosocial.

Research Question #5

Do the teachers and occupational therapists differ in their opinions about groups of items constituting a reason for referral when the items are divided into the categories of daily living skills, psychosocial skills, sensorimotor skills, cognitive components, and therapeutic adaptation/prevention?

One way analysis of variance (ANOVA) procedures were done to compare items scored by teachers and therapists. Five dependent variables were the item groupings or domains: activities of daily living (ADL) with 9 items, cognitive with 7 items, psychosocial with 10 items, sensorimotor with 32 items, and therapeutic adaptation/prevention (Ther. Ad/P.) with 6 items.

Some teachers failed to answer any item in one of the five categories of items. This happened in three instances and those questionnaires were unuseable, resulting in a total of 101 teacher questionnaires being used for this analysis. Respondents also failed to report experience or work setting in some cases making their questionnaire data ineligible for some of the analysis. This resulted in the variation in sample sizes reported in the following comparisons.

The therapists were divided according to whether or not they had school experience because this division was significant with the cognitive domain of items ($F(1, 186)=4.63$, $p=.033$) (Magill-Evans & Madill, 1990). This division was not indicated as significant by the statistical procedures used in this study. This analysis used the Scheffé method which is very conservative, requiring large differences in means before significance is attained, while the Magill-Evans and Madill (1990) study used the least significant difference test. Also, the means were calculated differently in the two studies. Because the return rate was low, it was decided to sacrifice some power and use the conservative Scheffé procedure to increase the confidence which could be placed in the differences which were indicated by the analyses. Means, variances, and results of tests of homogeneity of variance are given in Appendix G. A few of the tests of homogeneity of variance were significant and this should be kept in mind when interpreting the results.

Comparing Teachers And Therapists

The teachers (N = 101) and therapists (N = 192) scored all five groups of items significantly differently (see Table 18). The differences in the ADL, sensorimotor, and therapeutic adaptation/prevention categories were that the therapists scored the items as being more important indicators for referral than did the teachers. Cognitive and psychosocial groups of items were more important to the teachers.

Table 18

ANOVA Summary for Comparison Between Teachers and Therapists

Variable	M.S. Between	df	M.S. Within	df	F ratio	Prob.
ADL	163.66	1	14.93	291	10.96	.001
Cognitive	708.97	1	16.14	291	43.93	.000
Psychosocial	1643.21	1	29.88	291	55.00	.000
Sensorimotor	25478.10	1	207.72	291	122.65	.000
Ther. Ad/P.	673.19	1	9.29	291	72.47	.000

Comparing Teachers and Therapists with Different Experience

Teachers with special education experience (n = 47), teachers without this background (n = 48), therapists with school experience (n = 158),and therapists without school experience (n = 30) were compared. Six teachers and four therapists did not report experience and are not included in this analysis. Significant differences were found in each domain of items (see Table 19).

Table 19

ANOVA Summary for Comparison Between Teachers and Therapists with Different Experience

Variable	M.S. Between	df	M.S. Within	df	F ratio	Prob.
ADL	61.11	3	15.18	279	4.03	.008
Cognitive	292.11	3	15.55	279	18.79	.000
Psychosocial	629.17	3	28.64	279	21.97	.000
Sensorimotor	8428.96	3	208.03	279	40.52	.000
Ther. Ad/P.	213.26	3	9.23	279	23.11	.000

Post hoc testing using the Scheffé method of multiple comparisons was used to identify contrasts which reached statistical significance when the Type I error rate was set at .05. No significant differences occurred intra-professionally; rather the differences were between some group(s) of teachers and group(s) of therapists as denoted by an asterisk in Table 20 and described as follows:

ADL - Both groups of therapists scored the items as being more important than did the teachers with no special education experience.

Cognitive and Psychosocial - The teachers scored the items as being more important than the therapists with school experience. In addition, the teachers with a special education background also rated the items as more important than did the other group of therapists, without school experience.

Sensorimotor and Therapeutic adaptation/prevention - The therapists scored these items as more important than did teachers.

Comparing Teachers from Different Types of Schools and Therapists with Different Experience

Comparisons were made between teachers from schools with extensive special education programs (n = 44), teachers from schools without extensive special education programs (n = 57), therapists with school-based experience (n = 158), and therapists without school-based experience (n = 30). Four therapists not reporting experience were not included in this analysis. Significant differences were found in all five domains as shown in Table 20

Table 20

ANOVA Summary for Comparison Between Teachers from Different Types of Schools and Therapists with Different Experience

Variable	M.S. Between	df	M.S. Within	df	F ratio	Prob.
ADL	66.16	3	15.04	285	4.4	.005
Cognitive	273.89	3	15.85	285	17.28	.000
Psychosocial	592.51	3	29.35	285	20.19	.000
Sensorimotor	8450.61	3	209.50	285	40.34	.000
Ther. Ad/P.	224.47	3	9.37	285	23.11	.000

Using the post hoc Scheffé method significant differences between the two subgroups of teachers, or the two subgroups of therapists were not evident; differences occurred inter-professionally as noted below:

ADL - Both groups of therapists scored these items as more important than teachers in schools without special education programs.

Cognitive - Both groups of teachers scored these items as more important than the therapists with school experience.

Psychosocial, Sensorimotor, and Therapeutic adaptation/prevention - Both groups of teachers differed from both groups of therapists, and the direction of the difference varied. Psychosocial items were rated as more important by teachers while therapists identified sensorimotor and therapeutic adaptation/prevention items as being more important.

Summary of research question #5. Significant differences of opinion between teachers and therapists were found in all five areas. When the teachers and therapists were divided into subgroups, significant differences were indicated between many subgroups along professional lines but none were found between intra-professional subgroups. The direction of differences varied among the categories, but the pattern was the same in every comparison. ADL, sensorimotor, and therapeutic adaptation/ prevention were scored as more important by therapists; psychosocial and cognitive items were scored as more important by the teachers.

Of the 40 inter-professional contrasts examined by the Scheffé method, 32 values were found to be significant (α=.05). Appendix H provides summary data for all Scheffé procedures.

Research Question #6

Are there differences in the opinions of teachers and pediatric occupational therapists in relation to their years of experience?

Teachers and therapists with <9 years of experience in their fields were compared with teachers and therapists with ≥10 years of experience. The respondents not reporting years of experience were omitted from this analysis (one therapist and six teachers). Fifty-five therapists and 60 teachers had more than ten years in their field, while 136 therapists and 41 teachers had less than ten years. As reported in Table 21, significant differences were found in all categories of items.

Table 21

ANOVA Summary for Comparison Between Teachers and Therapists with Different Lengths of Experience

Variable	M.S. Between	df	M.S. Within	df	F ratio	Prob.
ADL	134.97	3	14.24	288	9.48	.000
Cognitive	238.96	3	16.25	288	14.71	.000
Psychosocial	562.40	3	30.01	288	18.74	.000
Sensorimotor	8792.48	3	206.76	288	42.53	.000
Ther. Ad/P.	249.23	3	9.13	288	27.31	.000

The results of the Scheffé method indicated that inter-professional contrasts were significant with one exception. In the ADL domain the less experienced teachers scored items as less important referral indicators than the other three groups of respondents. This is the only instance of significant difference found between intra-professional subgroups: the two subgroups of teachers scored the ADL items differently. Therapists and the more experienced teachers rated items in a similar manner.

CHAPTER VI

Discussion

The major finding from this study is that there were statistically significant differences of opinion between therapists and teachers about the importance of the behaviors on the checklist. The proportion of therapists scoring the items as important was greater than teachers. ANOVA and post hoc Scheffé method indicated that when items grouped by OT domains of practice were analyzed, the most significantly different comparisons were between therapists and teachers. The descriptive statistics and ANOVA results pointed to relative homogeneity within each professional group in rating the items.

This pattern is not particularly surprising as it likely reflects the unifying effect of professional education and working roles. Since all the items originated from occupational therapy practice, therapists could be expected to consider them as important indicators for OT service. This was the case for activities of daily living, sensorimotor components, and therapeutic adaptation/prevention.

For the cognitive and psychosocial behaviors, scoring also followed the trend of differing along professional boundaries. However, in these two categories teachers scored the items as more important than therapists.

The cognitive domain is an area of professional overlap where the educators are more active than therapists. The educational system can be viewed, if narrowly, as primarily serving the intellectual or cognitive needs of students, whereas in occupational therapy, improvement in cognitive ability is often seen as one of the eventual outcomes of direct assistance with the child's other developmental needs or requirements for environmental adaptations.

In the Magill-Evans and Madill (1990) study, the cognitive area was the one domain where the ratings of therapists without school experience differed from therapists with school experience. These items were considered more important by those without firsthand experience of the OT role in school systems. Therapists with school experience may have scored cognitive items as less important reasons for referral as they are less professionally invested than teachers in this area and are not likely to be directly called upon to deal with this domain. One mitigating factor is the number of other professionals that provide help in this area. As suggested by Magill-Evans and Madill (1990), specialists in reading, in mathematics, resource room teachers, and psychologists all offer expertise in cognitive functioning. Occupational therapists in the school system have been called upon to use their scarce resources in

other areas where there are great needs and few specialists. Nonetheless, the issue raised by Magill-Evans and Madill (1990) is reinforced by results of this study: "Occupational therapists need to clarify the uniqueness of their approach to cognitive function and its relationship to task performance in school" (p. 138).

The psychosocial items, which teachers also scored as being more important than therapists, represent an area of practice which has historically been of great importance to OT. One of the first descriptions of an OT program in a Canadian regular school included a psychosocial service (Bell & Burch, 1977). Magill-Evans and Madill (1990) offer several possible reasons for therapists' current low rating of items in this domain: OTs may not feel they have sufficient skills to work in this domain in a school setting; other professionals may be already filling these needs; or school administrators may have narrowed the scope of OT due to an incomplete understanding of the profession.

The issue however, may not be confined to school-based practice. A "crisis" in Canadian psychosocial occupational therapy is perceived by several authors cited by Renwick et al. (1990). In the American experience a neglect of pediatric psychosocial OT specifically has been identified as more therapists specialize in the broad area of physical disabilities (Florey, 1989). Be it school-based or profession-wide, the need to clarify present psychosocial occupational therapy practice is evident.

Psychosocial and cognitive behaviors received the highest endorsement by the educators as being able to hinder students' performance in their educational programs. Occupational therapists gave the least importance to the items which the teachers felt had the greatest educational impact. To some extent teachers rated the items that they have the skills to deal with themselves as having the most impact but these behaviors were also much more important referral items for the teachers than they were for therapists. This underscores the need for OTs to examine their practice in the cognitive and psychosocial areas. By focussing on problems that educators might see as more peripheral OTs are perhaps reinforcing the view of therapists as external health professionals. This view is not justified by results of this study, because important referral items were rated as also having educational impact, though not the most important impact. However, by giving the most educationally relevant problems short shrift, therapists may be helping to perpetuate a peripheral role for themselves in school systems.

One other point must be kept in mind when reviewing the rating by teachers and therapists. The therapists were asked about referral specifically to OT services while the teachers were asked to rate the items more generally, in terms of referral to any

specialist. If the therapists had rated the items in a general way, they may have indicated the items as being more important for referral particularly in the psychosocial and cognitive domains where there are several types of specialists to whom one could direct a referral. In the other domains where there are fewer types of specialists who can offer assistance, the rating according to referral to an OT might more closely approximate the general rating; scoring by therapists might have shifted less in these domains if they had been asked the same question as the teachers. Conversely, if the teachers had been asked to rate the items according to referral to OT, as the therapists did, they may have scored them as less important. Being unfamiliar with OT services, they might not have placed as much importance on indicators for referral to those services especially in the cognitive and psychosocial areas where they may be accustomed to making referrals to other specialists. The overall effect of the two professions answering two slightly different questions was probably to decrease the difference in their scoring of the items particularly in the cognitive and psychosocial areas.

Another major focus of this study was to establish whether differences between the scoring by therapists and teachers were great enough, in an item by item analysis, to shed doubt on the value of any item. The majority of items were endorsed to some degree by both professional groups. On 34 items there was some agreement as to their importance by both groups; another 19 items were weakly endorsed, but none were considered to be unimportant by both groups.

Three psychosocial items were scored as much less important by therapists. There are only 10 items in this category and to de-value these three would be to reinforce the trend of OTs being relatively inactive in this area of practice in schools. This is a difficult issue and the information to be acquired in the later stages of the instrument's development will be valuable for the psychosocial items in particular.

Two other items which generated disagreement were the most highly rated by the therapists and had to do with computer access. Teachers outside metropolitan areas are probably aware that computers can assist special needs students but have limited access to that technology. For occupational therapists, this is a new field as well, but high technology assistive devices for special needs populations has become an important area of practice. The disagreement about these items can be expected to decrease in future as all students spend more time on computers in school.

The remaining items on which therapists and teachers disagreed were six sensorimotor behaviors (25, 28, 29, 31, 32, 46). In each case teachers rated them as much less important than therapists. Teachers are unlikely to use these items to describe the behaviors of students who they refer to OT, and are unlikely to refer students who exhibit these behaviors either because they do not believe these behaviors to be important or perhaps because they have not been trained to notice some of the subtle movements the items describe.

There are 32 sensorimotor items in all; half the questionnaire items were from this category. Nine behaviors which were scored with more agreement than the six mentioned have to do with fine motor function such as handling scissors or small items in general, copying, and handwriting. It may well be that items 29, 31, and 32 which describe pencil grasp, holding paper while handwriting, and associated movements during hand activities, are deemed extraneous. Similar functions are addressed by other descriptors so the same students may well be identified by screening using the other, more valued, items.

Items 28 and 46, describing difficulty with ball play and poor rhythm, have no overlapping items. Neither behavior was viewed as a priority by teachers, and although these items are part of larger problems, which have other manifestations, a therapist is very unlikely to see a client because of either behavior alone. When all data has been collected, decisions must be made about how widely the screening items will stray from classroom priorities in an attempt to comprehensively include the related aspects of any one problem.

The last contentious item is 25, describing too much joint movement. Few teachers saw this items as important (19.2%), and more than a third of them (37.5%) responded that it would never be a cause for referral. Ultra flexibility is seldom a problem and in certain physical pursuits is a decided advantage. The difficulty which can accompany great mobility, and which is more often directly addressed by therapy, is a lack of sufficient strength to support the mobile joints. This problem is identified in item 35. As with the previous items, a decision will have to be made about balancing classroom priorities with problem indicators that are primarily meaningful to therapists. This is not the point in the development of the instrument at which such decisions can be made; these results serve to highlight some of the decisions to be made in the future.

The further development of the screening instrument is already planned, and includes research concerning the interrater and test-retest reliability of the tool. Specificity and sensitivity measures will be determined to ensure the instrument

classifies students in need of OT services without an over-identification problem leading to inappropriate referrals. Further item validation will be done to establish the internal consistency of the instrument; this will determine that when actually referring students, teachers make use of all items to some useful extent.

Other research suggested by this study concerns the way occupational therapy practice in schools is determined. Do OTs "...find themselves filling gaps in educational services rather than practicing occupational therapy"? (Madill, Tirrul-Jones, & Magill-Evans, 1990; p.107) What helps shape the scope of OT in schools; e.g. , expertise already present on the educational team, the individual therapist's skills, priorities set by school administrators, or variations in funding different types of students?

A related issue is the call to clarify the psychosocial area of OT practice which is given additional impetus by this survey (Renwick et al., 1990). What is, and what should be, the role of OT regarding psychosocial dysfunction in the school system?

As well as suggesting areas of research, this study reinforces the need for communication. Therapists and others on educational teams need to ensure that information flows easily between service providers if students are to benefit from their educational experiences. A good example is that therapists need to relay to teachers the possibilities of computer assistance for special needs students.

The number of comments made by superintendents, principals and teachers to explain their lack of participation in this study showed that they did not recognize OT as relevant to their particular setting. Hence the need for OTs to communicate information about their service to others in the educational system is strongly indicated. It is possible that some of the non-participating teachers refused to do so for the same reasons given by those who supplied comments (see Appendix F). Given the low return rate, a large number of teachers would appear to be unfamiliar with OT and/or students with special needs.

Within the population of Alberta non-metropolitan elementary grade teachers, the respondents probably represented the most informed group and were more familiar with students with special needs than were non-respondents, although they may not have had direct familiarity with occupational therapy. Such reasoning means that the teachers who answered this survey are also those teachers who could be expected to make most use of the final referral/screening instrument. To some extent this helps ameliorate the impact of the low return rate by implying that the results are very applicable to the highest user group, but it heightens the need to inform the other two-thirds of the teacher population.

Occupational therapists must develop discussion papers, guidelines, and position papers about their service mandate in school systems on a national basis (Madill et al., 1990). The profession needs to identify current practice, compare it with such models as exist and the Guidelines for Client-centred Practice of Occupational Therapy (DNHW & CAOT, 1983), and make recommendations about best-practice in school systems and modifications to models and guidelines as needed. Perhaps psychosocial and cognitive areas should remain less important domains as this study indicates they presently are, or perhaps efforts to widen the practice are required in order to bring help to more students with learning difficulties. This is on-going work for the profession in all areas of practice. However, it is of particular importance to school-based OT because of the newness of the practice, the shift required from a medical toward an educational model, and the danger that OT practice will become limited in scope before broad issues are examined during this early, formative stage of school-based occupational therapy.

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Appendix A

Questionnaire

for office use only [ ][ ][ ]

Please rate each of the listed behaviors according to the two scales by circling the appropriate number, assuming that the student has reached an age when each of the following behaviors should have been accomplished.

Scale 1: Impact
Based on your experience, please rate each of the behaviors listed as:
1 = never hinders the student in benefitting from educational program.
2 = may hinder the student in benefitting from educational program, if the student has several problems.
3 = frequently hinders the student in benefitting from educational program.
4 = always hinders the student in benefitting from educational program.

Scale 2: Referral
Based on your experience, please rate each of the behaviors listed as:
1 = never indicates a need for referral to personnel other than classroom teacher.
2 = may indicate a need for referral to personnel other than classroom teacher, if the student has several problems.
3 = frequently indicates a need for referral to personnel other than classroom teacher
4 = always indicates a need for referral to personnel other than classroom teacher.

Impact	Referral	The Student:
1 2 3 4	1 2 3 4	1. Is unable to manage toileting.
1 2 3 4	1 2 3 4	2. By age 10, pays little attention to personal appearance; is messy and unkempt.
1 2 3 4	1 2 3 4	3. Has difficulty with swallowing, chewing, drinking, or drooling.
1 2 3 4	1 2 3 4	4. Needs assistance with self-feeding or is exceptionally sloppy.
1 2 3 4	1 2 3 4	5. Has trouble putting on clothes & changing; has difficulty with fastenings
1 2 3 4	1 2 3 4	6. Has difficulty with stairs (holds bannister, 2 feet/step).
1 2 3 4	1 2 3 4	7. Walks poorly with assistive devices (e.g., canes, walker, crutches).
1 2 3 4	1 2 3 4	8. Habitually walks on toes.
1 2 3 4	1 2 3 4	9. Needs help with use of wheelchair.
1 2 3 4	1 2 3 4	10. Cannot hop on one foot, jump in place, or walk so that heel of foot strikes ground before rest of foot.
1 2 3 4	1 2 3 4	11. Does not have reciprocal arm & leg movements when walking.
1 2 3 4	1 2 3 4	12. Stumbles & falls more frequently than others his age.
1 2 3 4	1 2 3 4	13. By age 8, has difficulty using a telephone.
1 2 3 4	1 2 3 4	14. Has difficulty handling small items (e.g., coins, paperclips).
1 2 3 4	1 2 3 4	15. Has physical difficulties in accessing a computer.
1 2 3 4	1 2 3 4	16. Requires special adjustments to use a computer in class.
1 2 3 4	1 2 3 4	17. Has difficulty with doorknobs and faucets.
1 2 3 4	1 2 3 4	18. By age 8, has difficulty with simple homemaking tasks.
~~1 2 3 4~~	~~1 2 3 4~~	~~19. By high school, has unrealistic career plans in light of abilities.~~
~~1 2 3 4~~	~~1 2 3 4~~	~~20. Lacks basic job acquisition skills (e.g., applications, interviews).~~
1 2 3 4	1 2 3 4	21. Rarely plays with other children; doesn't have friends.
1 2 3 4	1 2 3 4	22. Has difficulty taking turns, sharing or following rules.
1 2 3 4	1 2 3 4	23. Does not play age-appropriate games.
1 2 3 4	1 2 3 4	24. Has extreme stiffness at any joint which limits function.
1 2 3 4	1 2 3 4	25. Has too much movement in joints; seems double jointed.
1 2 3 4	1 2 3 4	26. Has a splint or brace that interferes with class work.
1 2 3 4	1 2 3 4	27. Has difficulty using scissors or cutting along a line.
1 2 3 4	1 2 3 4	28. Has difficulty bouncing, throwing, or catching a large ball.
1 2 3 4	1 2 3 4	29. Holds pencil awkwardly; presses too hard or too lightly.
1 2 3 4	1 2 3 4	30. By age 9, has difficulty spacing letters; is messy.
1 2 3 4	1 2 3 4	31. When writing, doesn't use nondominant hand to stabilize the paper.
1 2 3 4	1 2 3 4	32. When using one hand, tenses or moves the other.
1 2 3 4	1 2 3 4	33. Loses place when reading; moves head as well as eyes when reading.
1 2 3 4	1 2 3 4	34. Doesn't allow others to be nearby when working; is upset by unexpected touch.

Scale 1: Impact
Based on your experience, please rate each of the behaviors listed as:
1 = never hinders the student in benefitting from educational program.
2 = may hinder the student in benefitting from educational program, if the student has several problems
3 = frequently hinders the student in benefitting from educational program.
4 = always hinders the student in benefitting from educational program.

Scale 2: Referral
Based on your experience, please rate each of the behaviors listed as:
1 = never indicates a need for referral to personnel to other than classroom teacher.
2 = may indicate a need for referral to personnel other than classroom teacher, if the student has several problems
3 = frequently indicates a need for referral to personnel other than classroom teacher
4 = always indicates a need for referral to personnel other than classrooom teacher

Impact	Referral	The Student
1 2 3 4	1 2 3 4	35. Appears to have poor overall body strength; is "floppy".
1 2 3 4	1 2 3 4	36. Sometimes makes no attempt to catch himself when falling.
1 2 3 4	1 2 3 4	37. Has trouble holding head up when sitting.
1 2 3 4	1 2 3 4	38. Slumps to one side or slides forward in chair or wheelchair.
1 2 3 4	1 2 3 4	39. Has a hard time keeping his balance; readjusts posture frequently.
1 2 3 4	1 2 3 4	40. Has difficulty with puzzles.
1 2 3 4	1 2 3 4	41. Has difficulty copying from the blackboard.
1 2 3 4	1 2 3 4	42. By age 8, still has number or letter reversals or inversions.
1 2 3 4	1 2 3 4	43. Has difficulty copying shapes, numbers, or letters.
1 2 3 4	1 2 3 4	44. Has trouble pasting one piece of paper on another.
1 2 3 4	1 2 3 4	45. Is awkward and large movements are clumsy.
1 2 3 4	1 2 3 4	46. Has poorly developed sense of rhythm; can't play clapping games.
1 2 3 4	1 2 3 4	47. By age 7, still switches hands during activities; isn't skillful with either.
1 2 3 4	1 2 3 4	48. By age 9, still confuses right & left on self or another person.
1 2 3 4	1 2 3 4	49. Is confused about the meaning of directional words such as in front, behind, beside, up, above.
1 2 3 4	1 2 3 4	50. Has difficulty imitating simple body postures and movements; doesn't cross the body midline.
1 2 3 4	1 2 3 4	51. Is unable to draw a 6 part recognizable person with body.
1 2 3 4	1 2 3 4	52. Is easily distracted; has a short attention span.
1 2 3 4	1 2 3 4	53. Is hyperactive, very restless.
1 2 3 4	1 2 3 4	54. Has difficulty communicating events sequentially.
1 2 3 4	1 2 3 4	55. Can not repeat 3 words or numbers.
1 2 3 4	1 2 3 4	56. Has difficulty classifying or categorizing objects.
1 2 3 4	1 2 3 4	57. Has trouble applying concepts to a variety of situations.
1 2 3 4	1 2 3 4	58. Does not recognize when help is needed; does not request help.
1 2 3 4	1 2 3 4	59. Cannot realistically identify his strengths and limitations.
1 2 3 4	1 2 3 4	60. Has no strategy for solving simple problems.
1 2 3 4	1 2 3 4	61. Is easily frustrated or discouraged.
1 2 3 4	1 2 3 4	62. Does not express emotions or needs in socially appropriate ways; has no strategies for relieving stress and tension.
1 2 3 4	1 2 3 4	63. Is unaware of others' feelings & needs; doesn't recognize nonverbal cues.
1 2 3 4	1 2 3 4	64. Has difficulty communicating with peers or strangers.
1 2 3 4	1 2 3 4	65. Does not recognize when he needs to change his behavior.
1 2 3 4	1 2 3 4	66. Has difficulty with group participation; is uncooperative.
1 2 3 4	1 2 3 4	67. Other_____

Years of teaching experience, counting this school year. _____

Years of elementary special education experience, counting this school year. (e.g. resource room teacher, teacher of dependent handicapped, developmentally delayed, mentally retarded or learning disabled students, or integrated classroom experience.) _____

Comments and Suggestions: Please use the back of this sheet.

Appendix B

Letter and Reply Form to Superintendents

University of Alberta
Edmonton
Canada T6G 2R3

Department of Occupational Therapy
Faculty of Rehabilitation Medicine

Telephone (403) 492-2499, Fax (403) 492-1626
4075 UAH Education & Development Centre

Dear

I am seeking permission to contact principals and teachers in your school district as part of a study being conducted by Dr. Helen Madill and Dr. Joyce Magill-Evans. A screening instrument has been developed and piloted using occupational therapists, and data from a validity study using a sample of Alberta school administrators are being analyzed. The current study requires information from teachers so that the final screening tool will describe problem learning behaviors that are relevant to both educators and therapists.

Lack of a comprehensive referral system and a shortage of therapists has resulted in lengthy waiting lists for occupational therapy services in schools. Without a reliable and valid screening instrument it is impossible to determine service priorities without administering a costly assessment process to all students referred, regardless of their needs. Development of a valid and reliable screening instrument is critical.

To complete this section of the project I would like to receive approval to contact a random sample of 1 to 5 elementary school principals in your jurisdiction before the end of the school year. Each would be asked to distribute a copy of the enclosed questionnaire to all the elementary grade teachers in their school and collect and return this material within a two week period. The identitiy of the respondents is not required and no comparison of different districts will be made. Each participating school district would receive acknowledgement in any conference presentations or publications.

A reply form and stamped, addressed envelope is enclosed. More information about the project can be obtained by calling either 492-2342 or 492-0402 and I can be reached on 458-9501. I look forward to receiving your reply in the next two weeks.

Yours sincerely,

Ms. Anu Tirrul-Jones, BSc(OT)., OT(C)
Graduate Student

Superintendent reply form

I give my permission to Anu Tirrul-Jones to contact elemer school principals in my jurisdiction for the purpose of distributing questio. .res to the teachers in their schools as part of her study regarding a screening/referral instrument development.

signature_____

date_____

School District_____

I do not permit Anu Tirrul-Jones to contact elementary school principals in my jurisdiction in connection with her screening/referral instrument study.

signature_____

date_____

School District_____

Appendix C
Letter of Transmittal to Principals

University of Alberta
Edmonton
Canada T6G 2R3

Department of Occupational Therapy
Faculty of Rehabilitation Medicine
Telephone (403) 492-2499, Fax (403) 492-1626
4075 UAH Education & Development Centre

Dear

This is a request to survey the teachers in your school as part of a study being conducted in the Department of Occupational Therapy. The project directors are Dr. Helen Madill and Dr. Joyce Magill-Evans. A screening instrument has been developed for use by teachers to refer students to school-based occupational therapy services. Data from occupational therapists and school administrators has been collected. The current study requires information from teachers so that the final screening tool will describe **problem learning behaviors** that are important to both educators and therapists.

Lack of a comprehensive referral system is partially responsible for lengthy waiting lists for occupational therapy services in schools. A reliable and valid screening instrument would make it possible to determine service priorities without administering a costly assessment process to all students referred, regardless of their needs.

In order to complete this section of the project please distribute the enclosed questionnaires to each of the elementary (grades 1 to 6) teachers in your school. They should be returned to your office within one week after being distributed, and mailed back to me in the enclosed stamped, addressed envelope. The identity of the respondents is not required and no comparison of responses from different schools will be made. The superintendent of your school district has given approval to this project; however, should you choose not to have your school participate please return the material to me.

More information about the project can be obtained by calling either 492-2342 or 492-0402 and I can be reached on 548-9501. Your comments or questions are welcome. I look forward to receiving a reply from your office in the next three weeks.

Yours sincerely,

Anu Tirrul-Jones, BSc(OT), OT(C)
Graduate Student
University of Alberta, Department of Occupational Therapy School-based Screening Instrument Study

Appendix D

Letter of Transmittal to Teachers

University of Alberta
Edmonton
Canada T6G 2R3

Department of Occupational Therapy
Faculty of Rehabilitation Medicine
Telephone (403) 492-2499, Fax (403) 492-1626
4075 UAH Education & Development Centre

Dear colleague,

As an occupational therapy consultant in northern Alberta, I am well aware that teacher referrals tend to be one of the most accurate tools in the identification of students with special needs. One of my concerns is to see that when teachers identify students with special needs, that these important observations are easily conveyed to the person who undertakes further assessment. To help make referrals to therapists as efficient as possible and to assist with setting priorities for service, a screening/referral instrument is being designed in a study currently conducted in the Department of Occupational Therapy. Input from educators is needed to augment data already received from therapists and school administrators.

The attached questionnaire can usually be completed in 10 to 20 minutes. Lengthy deliberation over specific items is not required. Please share with me your reactions to the questions; space for comments has been left on the back of the form and feel free to write anywhere else on the questionnaire too.

Please return the completed questionnaire to the principal's office within one week. Your responses to all items will be much valued, and will be confidential. Should you choose not to participate, please return the questionnaire to the office.

This study has been approved by the University of Alberta and the superintendent of your school district. Your cooperation will benefit students, teachers, and school-based occupational therapists.

Yours sincerely,

Anu Tirrul-Jones, BSc(OT), OT(C)
Graduate Student

Appendix E

Missing Data for All Items

Item	Category	Referral	Impact
1. Unable to manage toileting.	A	3	3
2. By age 10, is messy and unkempt.	A	3	4
3. Difficulty with swallowing, chewing, or drooling.	A	8	6
4. Needs assistance with self-feeding.	A	7	7
5. Trouble changing clothes; difficulty with fastenings.	A	8	10
6. Difficulty with stairs.	S	8	7
7. Walks poorly with assistive devices.	T	11	11
8. Habitually walks on toes.	S	13	13
9. Needs help with use of wheelchair.	A	12	12
10. Can't hop, jump, or heel-toe walk.	S	8	7
11. No reciprocal limb movements when walking.	S	10	11
12. Stumbles, falls more often than peers.	S	4	4
13. By age 8, difficulty using a telephone.	A	11	11
14. Difficulty handling small items.	S	9	8
15. Physical difficulty accessing computer.	T	9	9
16. Requires adjustments to use computer in class.	T	12	11
17. Difficulty with doorknobs and faucets.	S	9	8
18. By age 8, difficulty with homemaking tasks.	A	10	10
21. Rarely plays [illegible] children; lacks friends.	P	3	3
22. Difficulty taking [illegible] following rules.	P	5	5
23. Doesn't play [illegible] iate games.	A	4	4
24. Extreme st[illegible] joint which limits function.	T	5	6
25. Too much m[illegible] in joints; double jointed.	S	8	9
26. Splint or brace interferes with class work.	T	7	7
27. Difficulty using scissors.	S	4	4
28. Difficulty handling a ball.	S	1	2
30. By age 9, difficulty spacing letters; messy.	S	3	3
31. When writing, doesn't stabilize paper.	S	5	5
32. When using one hand, tenses or moves the other.	S	12	11
33. Loses place when reading; moves head.	S	5	3
34. Doesn't allow others nearby; upset by unexpected touch.	S	6	6
35. Poor overall body strength; is "floppy".	S	7	6
36. Makes no attempt to catch self when falling.	S	10	11
37. Trouble holding head up when sitting.	S	10	11
38. Slumps/slides forward in chair or wheelchair.	T	9	10
39. Trouble keeping balance; often adjusts posture.	S	8	11
40. Difficulty with puzzles.	S	5	5
41. Difficulty copying from blackboard.	S	3	3
42. By age 8, has number/letter reversals.	S	4	4
43. Difficulty copying shapes, numbers, or letters.	S	3	3
44. Trouble pasting paper.	S	6	6
45. Awkward and large movements are clumsy.	S	2	2
46. Poor sense of rhythm; can't do clapping games.	S	2	2
47. By age 7, switches hands during activities.	S	5	5

Item	Category	Referral	Impact
48. By age 9, confuses right & left on self or another.	S	6	5
49. Confused about directional words.	S	5	5
50. Difficulty imitating postures; doesn't cross midline.	S	5	5
51. Unable to draw 6 part person with body.	S	5	6
52. Easily distracted; short attention span.	C	4	1
53. Is hyperactive, very restless.	C	0	0
54. Difficulty communicating events sequentially.	C	2	0
55. Can't repeat 3 words or numbers.	C	6	5
56. Difficulty categorizing objects.	C	6	5
57. Trouble applying concepts to a variety of situations.	C	2	1
58. Doesn't recognize when help needed.	P	5	4
59. Can't identify strengths and limitations.	C	4	4
60. No strategy for solving simple problems.	C	3	2
61. Is easily frustrated or discouraged.	P	0	0
62. Doesn't express emotions appropriately.	P	3	2
63. Unaware of other's feelings.	P	3	3
64. Difficulty communicating with peers/strangers.	P	2	1
65. Doesn't recognize need to change behavior.	P	1	1
66. Difficulty with group participation; uncooperative.	P	3	2

Appendix F

Comments Made on the Questionnaires

Suggested additional items:

Negative social interactions--manipulative interactions. Rated 4 & 4

Maybe fine motor should be further developed--more formation--tracing--etc. is more of a hindrance to the student.

Verbalizes fantasies as facts (differentiate facts from fantasies) Rated 2 on impact, & 3 on referral.

Stubborn ignoring, bitterness & hostility. Rated 4 & 4.

Parents don't believe there is a problem. Rated 4 & 4.

Items for which age specification was desired:

Item	No. of respondents indicating
1, 5, 14, 28, 32, 34 43, 44,45, 52, 56, 57, 58, 59, 60	1
27, 31, 33, 54	2
49, 51	3
55	4

Explanations about missed items:

No observational experience. (Many items unanswered.)

No experience with this problem. (Many items unanswered.) Two respondents gave this comment.

N/A (Many items unanswered.) 4 respondents gave this comment.

To whom it may concern: I began looking at some of the questions in this questionnaire and I feel it is not sensible to answer any of them because I have no experience with the dependent handicapped, developmentally delayed, mentally retarded or learning disabled. (Entire questionnaire blank)

I have not had children who are dependent handicapped, developmentally delayed, mentally retarded or learning disabled children in my classroom and am unable to fill out this form. (Entire questionnaire blank)

Items 3 -to 18 not applicable for our class

Haven't noticed these

28 - Might be delay of large muscle development.

51 - Age & stage. Don't necessarily match.

Comments about the questionnaire:

If this sheet is the teachers' referral to a therapist I feel it would be more useful and valid if it had a section for anecdotal comments from the teacher such a responses to: What are your major areas of concern for this student? What do you most see yourself as needing assistance with for this student? What major characteristics does this student display? etc.

This is an excellent tool. Simple format, easy & not time-consuming, yet clues into many areas.

You might have wanted to ask at what grade level we teach. It might make a difference to our answers.

Comments about specific items:

3 - I don't know (scored 4 & 4)

4 - There's a big difference between "self-feeding" & "sloppy".
Could have been two questions.

5 - small motor production

6 - could pose a danger to student

3 - safety could present a problem

6 - (consultants)
- if no special eq. is available (scored 2 on impact & 3 on referral)
- if adjustments are not available

17 - safety?

18 - depends on home - habits & training

21 - contradictory - has friends but not able to play

21 - contradictory

30 - fine motor skills

31 - fine motor skills

35 - gross motor skills

- sometimes - ?
- gross motor skills

37 - gross motor skills

41 - optometrist

42 - depends on how many and how often

50 - affects handwriting/printing

55 - I was unsure what question 55 meant.

56 - how many [classifying objects]

65 - degree of inappropriateness?

Comments about the rating scale:

Scale 2: taken as professional referral. Assuming sometimes that child is handicapped.

"Always" and "never" aren't good descriptors to use in your "impact " & "referral" scale. things are rarely "always" or "never".

I would have preferred "seldom hinders" to "never hinders" in the scale--to say never hinders is too exclusive. I would hesitate to say various problems a child has

never hinders their educational program. While the impact of a certain behavior may not show a direct effect on the program we do not know what it is doing to the child's self esteem or sense of self worth which can so greatly impact his ability to learn.

Referral: 2 - school counsellor, special needs consultant, aide.

"Never" - Had trouble with this.

What is really your definition of an "educational program"?

Note: Many respondents indicated what type of special education experience they had, whether resource room, integrated classroom, etc.

The questions that I have checked seem most appropriate for the students in the regular class situations. (29-34, 42-48). Many of the others would apply to special education students only.

These are mostly my opinions--I have not worked with most of these difficulties.

I have not taught special needs in the capacity you are talking about. I would hope that if I were I would have an excellent resource base to draw upon--information pertaining to the student's particular needs, aides that are trained to work with special needs students, training for myself, experts, etc. [5 years of integrated classroom experience]

As space/time is limited with all resource personnel, referrals are made only after classroom teacher has exhausted her/his knowledge or skills. Also, while one condition (such as listed in survey) may not signify need for referral, presence of several increases urgency.

In the standard classroom is not the proper educational environment for a handicapped child.

I have worked with students with varying degrees of the problems mentioned within the regular classroom throughout the years. It is possible to integrate some of them but certainly not all of them.

Appendix G

ANOVA Means and Variances and Bartlett-Box and Cochran Tests of Homogeneity of Variance Results

Comparison of Teachers and Therapists

	Therapists $n = 192$	Teachers $n = 101$
Mean		
Activities of Daily Living (A)	24.88	23.30
Cognitive (C)	15.88	19.15
Psychosocial (P)	21.15	26.13
Sensorimotor (S)	93.01	73.39
Therapeutic adaptation/prevention (T)	17.60	14.41
Variance		
Activities of Daily Living	10.48	23.42
Cognitive	14.06	20.11
Psychosocial	25.32	38.60
Sensorimotor	174.64	270.91
Therapeutic adaptation/prevention	5.86	15.83

	Bartlett-Box Test	Cochran Test
(A)	$F(1, 193937.44) = 22.44, p = .000$	$F(145, 2) = .69, p = 1.000$
(C)	$F(1, 193937.44) = 4.31, p = .038$	$F(145, 2) = .59, p = 1.000$
(P)	$F(1, 193937.44) = 6.03, p = .014$	$F(145, 2) = .60, p = 1.000$
(S)	$F(1, 193937.44) = 6.55, p = .011$	$F(145, 2) = .61, p = 1.000$
(T)	$F(1, 193937.44) = 34.43, p = .000$	$F(145, 2) = .73, p = 1.000$

continued

Comparison of Teachers and Therapists with Different Experience

	Therapists		Teachers	
	no school experience	school experience	no sp. ed. experience	sp. ed. experience
	n = 30	*n* = 158	*n* = 48	*n* = 47
Mean				
(A)	25.47	24.73	22.82	23.87
(C)	17.23	15.51	18.01	20.19
(P)	21.67	20.84	24.95	27.47
(S)	93.13	92.86	69.75	77.08
(T)	17.93	17.51	14.06	14.82
Variance				
(A)	12.19	10.30	24.07	24.63
(C)	15.15	13.18	18.44	20.93
(P)	16.14	25.77	41.73	32.89
(S)	162.81	180.13	201.29	338.65
(T)	5.17	6.06	14.40	17.31

	Bartlett-Box Test	Cochran Test
(A)	F (3, 62835.05) = 7.70, p = .000	F (69,4) =.35, p =1.000
(C)	F (3, 62835.05) = 1.66, p = .175	F (69,4) =.31, p =1.000
(P)	F (3, 62835.05) = 3.00, p = .030	F (69,4) =.36, p = .874
(S)	F (3, 62835.05) = 2.92, p = .033	F (69,4) =.38, p = .419
(T)	F (3, 62835.05) =10.89, p = .000	F (69,4) =.40, p = .207

continued

Comparison of Teachers from Different Schools and Therapists with Different Experience

	Therapists		Teachers	
	no school experience	school experience	schools with sp. ed..	schools with no sp. ed.
	n=30	*n*=158	*n*=57	*n*=44
Mean				
(A)	25.47	24.73	22.85	23.90
(C)	17.23	15.51	19.30	18.97
(P)	21.67	20.84	25.84	26.52
(S)	93.13	92.84	71.68	75.61
(T)	17.93	17.51	14.10	14.82
Variance				
(A)	12.19	10.30	15.45	33.68
(C)	15.15	13.18	20.14	20.46
(P)	37.39	40.79	16.14	25.79
(S)	162.81	180.13	187.85	376.44
(T)	5.17	6.06	12.53	20.15

	Bartlett-Box Test	Cochran Test
(A)	F (3, 65796.06) = 9.65, p = .000	F (71,4) = .47, p = .006
(C)	F (3, 65796.06) = 1.92, p = .124	F (71,4) = .30 p =1.000
(P)	F (3, 65796.06) = 3.29, p = .020	F (71,4) = .34, p =1.000
(S)	F (3, 65796.06) = 3.95, p = .008	F (71,4) = .42, p = .121
(T)	F (3, 65796.06) =12.04, p = .000	F (71,4) = .46, p = .012

continued

Comparison of Teachers and Therapists with Different Lengths of Experience

	Therapists		Teachers	
	≤ 9 years	≥ 10 years	≤ 9 years	≥10 years
	n = 136	n = 55	n = 41	n = 89
Mean				
(A)	24.79	25.11	21.45	24.57
(C)	16.02	15.52	19.45	18.95
(P)	20.97	21.63	25.44	26.61
(S)	92.88	93.49	69.94	75.75
(T)	17.51	17.83	13.43	15.09
Variance				
(A)	11.30	8.73	26.25	17.90
(C)	15.30	11.29	23.70	17.90
(P)	26.84	22.09	49.67	31.13
(S)	194.61	129.71	369.92	194.45
(T)	5.72	6.30	15.39	15.27

	Bartlett-Box Test	Cochran Test
(A)	F (3, 97644.19) = 6.56, p = .000	F (72, 4) = .41, p = .152
(C)	F (3, 97644.19) = 2.30, p = .075	F (72, 4) = .35, p = 1.000
(P)	F (3, 97644.19) = 3.04, p = .028	F (72, 4) = .38, p = .416
(S)	F (3, 97644.19) = 4.54, p = .004	F (72, 4) = .42, p = .111
(T)	F (3, 97644.19) =10.56, p = .000	F (72, 4) = .36, p = .807

Note. The degrees of freedom for the Bartlett-Box Test are constructed from the formula in SPSS Inc. (1983). *SPSS X Statistical Algorithms.* p.42. Chicago: Author.

Appendix H

Results of Post Hoc Scheffé Method of Multiple Comparisons

Summary of Post Hoc Scheffé Method of Comparison Between Teachers and Therapists with Different Experience

Alpha = .05 df = 279 Table value for Scheffé = 2.81

ADL

		Teach. no sp.	Teach. sp.	Ther. sch.
Teach. sp.	S. E.	0.80		
	Req. Diff.	2.25		
	Obs. Diff.	1.05		
Ther. sch.	S. E.	0.64	0.65	
	Req. Diff.	1.81	1.82	
	Obs. Diff.	1.91*	0.86	
Ther. no sch.	S. E.	0.91	0.91	0.78
	Req. Diff.	2.55	2.56	2.18
	Obs. Diff.	2.64*	1.59	0.73

Cognitive

Teach. sp.	S. E.	0.81		
	Req. Diff.	2.28		
	Obs. Diff.	2.19		
Ther. sch.	S. E.	0.65	0.66	
	Req. Diff.	1.83	1.84	
	Obs. Diff.	2.49*	4.68*	
Ther. no sch.	S. E.	0.92	0.92	0.79
	Req. Diff.	2.58	2.59	2.21
	Obs. Diff.	0.77	2.96*	1.72

continued

Psychosocial			Teach. no sp.	Teach. sp.	Ther. sch.
	Teach. sp.	S. E.	1.10		
		Req. Diff.	3.09		
		Obs. Diff.	2.52		
	Ther. sch.	S. E.	0.88	0.89	
		Req. Diff.	2.48	2.50	
		Obs. Diff.	4.11*	6.62*	
	Ther. no sch.	S. E.	1.25	1.25	1.07
		Req.Diff.	3.50	3.52	3.00
		Obs. Diff.	3.28	5.80*	0.83
Sensorimotor					
	Teach. sp.	S. E.	2.96		
		Req. Diff.	8.32		
		Obs. Diff.	7.33		
	Ther. sch.	S. E.	2.38	2.40	
		Req. Diff.	6.69	6.74	
		Obs. Diff.	23.08*	15.76*	
	Ther. no sch.	S. E.	3.36	3.37	2.87
		Req. Diff.	9.44	9.48	8.08
		Obs. Diff.	23.38*	16.05*	0.30
Ther. adapt./prevention					
	Teach. sp.	S. E.	0.62		
		Req. Diff.	1.75		
		Obs. Diff.	0.75		
	Ther. sch.	S. E.	0.50	0.50	
		Req. Diff.	1.41	1.42	
		Obs. Diff.	3.44*	2.69*	
	Ther. no sch.	S. E.	0.71	0.71	0.60
		Req. Diff.	1.99	2.00	1.70
		Obs. Diff.	3.87*	3.12*	0.43

Note: Teach. sp. = Teachers with special education experience
Teach no sp. = Teachers without special education experience
Ther. sch. = Therapists with school related experience
Ther. no sch. = Therapists without school related experience

Summary of Post Hoc Scheffé Analysis of Comparison Between Teachers From Different Types of Schools and Therapists with Different Experience

Alpha = .05 df = 285 Table value for Scheffé = 2.81

ADL

		T/sch. no sp.	T/sch. sp. ed.	Ther. sch.
T/sch. sp. ed.	S. E.	0.78		
	Req Diff.	2.19		
	Obs. Diff.	1.05		
Ther. sch.	S. E.	0.60	0.66	
	Req Diff.	1.68	1.86	
	Obs. Diff.	1.89*	0.84	
Ther. no sch.	S. E.	0.87	0.92	0.77
	Req Diff.	2.46	2.58	2.17
	Obs. Diff.	2.62*	1.57	0.73

Cognitive

T/sch. sp. ed.	S. E.	0.80		
	Req Diff.	2.25		
	Obs. Diff.	0.33		
Ther. sch.	S. E.	0.62	0.68	
	Req Diff.	1.73	1.91	
	Obs. Diff.	3.78*	3.46*	
Ther. no sch.	S. E.	0.90	0.94	0.79
	Req Diff.	2.93	2.65	2.23
	Obs. Diff.	2.05	1.74	1.72

continued

Psychosocial

		T/sch. no sp.	T/sch. sp. ed.	Ther. sch.
T/sch. sp. ed.	S. E.	1.09		
	Req Diff.	3.06		
	Obs. Diff.	0.68		
Ther. sch.	S. E.	0.84	0.92	
	Req Diff.	2.35	2.60	
	Obs. Diff.	5.00*	5.67*	
Ther. no sch.	S. E.	1.22	1.28	1.08
	Req Diff.	3.44	3.61	3.03
	Obs. Diff.	4.17*	4.84*	0.83

Sensorimotor

T/sch. sp. ed	S. E.	2.90		
	Req Diff.	8.17		
	Obs. Diff.	3.93		
Ther. sch.	S. E.	2.24	2.47	
	Req Diff.	6.29	6.94	
	Obs. Diff.	21.16*	17.22*	
Ther. no sch.	S. E.	3.26	3.43	2.88
	Req Diff.	9.18	9.64	8.11
	Obs. Diff.	21.46*	17.52*	0.30

Ther. adapt./prevention

T/sch. sp. ed.	S. E.	0.61		
	Req Diff.	1.73		
	Obs. Diff.	0.72		
Ther. sch.	S. E.	0.47	0.52	
	Req Diff.	1.33	1.47	
	Obs. Diff.	3.41*	2.68*	
Ther. no sch.	S. E.	0.89	0.72	0.61
	Req Diff.	1.94	2.04	1.71
	Obs. Diff.	3.83*	3.11*	0.43

Note: T/sch. sp. ed. = Teachers from schools with extensive special educational programs
T/sch. no sp. = Teachers from schools without extensive special educational programs
Ther. sch. = Therapists with school related experience
Ther. no sch. = Therapists without school related experience

Summary of Post Hoc Scheffé Analysis of Comparison Between Teachers and Therapists with Different Lengths of Experience

Alpha = .05 df = 288 Table value for Scheffé = 2.81

ADL

		Teach. ≤ 9	Teach. ≥ 10	Ther. ≤ 9
Teach. ≥ 10	S. E.	0.76		
	Req Diff.	2.15		
	Obs. Diff.	3.12*		
Ther. ≤ 9	S. E.	0.67	0.58	
	Req Diff.	1.89	1.64	
	Obs. Diff.	3.34*	0.22	
Ther. ≥ 10	S. E.	0.78	0.70	0.60
	Req Diff.	2.19	1.98	1.70
	Obs. Diff.	3.66*	3.54	0.32

Cognitive

Teach. ≥ 10	S. E.	0.82		
	Req Diff.	2.30		
	Obs. Diff.	0.50		
Ther. ≤ 9	S. E.	0.72	0.62	
	Req Diff.	2.02	1.76	
	Obs. Diff.	3.44*	2.94*	
Ther. ≥ 10	S. E.	0.83	0.75	0.64
	Req Diff.	2.34	2.12	1.81
	Obs. Diff.	3.87*	3.37*	0.43

continued

Psychosocial			Teach. ≤ 9	Teach. ≥ 10	Ther. ≤ 9.
	Teach. ≥ 10	S. E.	1.11		
		Req Diff.	3.12		
		Obs. Diff.	1.17		
	Ther. ≤ 9	S. E.	0.98	0.85	
		Req Diff.	2.74	2.39	
		Obs. Diff.	4.47*	5.64*	
	Ther. ≥ 10	S. E.	1.13	1.02	0.88
		Req Diff.	3.18	2.88	2.46
		Obs. Diff.	3.81*	4.98*	0.67
Sensorimotor					
	Teach. ≥ 10	S. E.	2.91		
		Req Diff.	8.19		
		Obs. Diff.	5.81		
	Ther. ≤ 9	S. E.	2.56	2.23	
		Req Diff.	7.20	6.27	
		Obs. Diff.	22.93*	17.13*	
	Ther. ≥ 10	S. E.	2.97	2.68	2.30
		Req Diff.	8.34	7.55	6.46
		Obs. Diff.	23.55*	17.74*	0.62
Ther. adapt./prevention					
	Teach. ≥ 10	S. E.	0.61		
		Req Diff.	1.72		
		Obs. Diff.	1.66		
	Ther. ≤ 9	S. E.	0.54	0.47	
		Req Diff.	1.51	1.32	
		Obs. Diff.	4.08*	2.42*	
	Ther. ≥ 10	S. E.	0.62	0.56	0.48
		Req Diff.	1.75	1.59	1.36
		Obs. Diff.	4.44*	2.79*	0.37

Note: Teach. ≤ 9 = Teachers with 9 or fewer years of experience
Ther. ≤ 9 = Therapists with 9 or fewer years of experience
Teach. ≥ 10 = Teachers with 10 or more years of experience
Ther. ≥10 = Therapists with 10 or more years of experience

Appendix I

Teachers' Responses Expressed as Two Types of Percentages

Teachers Scoring Items as Important on the Impact Part of the Scale, Expressed as Two Types of Percentages

Item	n	% of those responding	% of 104
55. Can not repeat 3 words or numbers.	84	84.9	80.8
53. Is hyperactive, very restless.	81	77.9	77.9
62. Does not express emotions appropriately.	76	75.5	73.1
52. Is easily distracted; has a short attention span.C	76	73.8	73.1
65. Doesn't recognize need to change behavior.	74	71.9	71.1
66. Difficulty with group participation; uncooperative.	73	71.9	70.2
57. Has trouble applying concepts to a variety of situations.	70	68.0	67.3
64. Has difficulty communicating with peers or strangers.	69	66.9	66.4
61. Is easily frustrated or discouraged.	69	66.4	66.4
37. Has trouble holding head up when sitting.	68	73.1	65.4
54. Has difficulty communicating events sequentially.	68	65.4	65.4
1. Is unable to manage toileting.	67	67.3	64.4
60. Has no strategy for solving simple problems.	66	64.7	63.4
58. Does not recognize when help is needed.	64	64.0	61.5
63. Is unaware of other's feelings.	63	62.4	60.6
56. Has difficulty classifying or categorizing objects.	61	59.8	58.6
38. Slumps/slides forward in chair or wheelchair.	59	62.8	56.8
3. Difficulty with swallowing, chewing, or drooling.	58	59.2	55.8
4. Needs assistance with self-feeding.	58	59.8	55.8
43. Has difficulties copying shapes, numbers, or letters.	56	55.5	53.8
22. Has difficulty taking turns, sharing or following rules.	53	53.6	51.0
41. Has difficulty copying from the blackboard.	51	50.5	49.0
34. Doesn't allow others nearby; upset by unexpected touch.	47	47.9	45.2
21. Rarely plays with other children; doesn't have friends.	47	46.5	45.2
39. Trouble keeping balance; readjusts posture frequently.	45	48.4	44.2
49. Is confused about the meaning of directional words.	45	45.5	43.3
42. By age 8, still has number or letter reversals.	45	45.0	43.3
59. Cannot identify strengths and limitations.	45	45.0	43.3
33. Loses place when reading; moves head.	45	44.6	43.3
5. Trouble putting on clothes; difficulty with fastenings.	41	43.6	39.4
51. Is unable to draw a 6 part person with body.	39	39.8	39.4
44. Has trouble pasting one piece of paper on another.	36	35.6	37.5
30. By age 9, has difficulty spacing letters; is messy.	36	35.6	34.6
26. Has a splint or brace that interferes with class work.	34	35.0	32.7
23. Does not play age-appropriate games.	33	33.0	31.8
2. By age 10, is messy and unkempt.	32	32.0	30.8
48. By age 9, confuses right & left on self or another.	31	31.3	29.9
40. Has difficulty with puzzles.	29	29.3	27.9

Item	n	% of those responding	% of 104
50. Difficulty imitating simple body postures &movements; doesn't cross the body midline.	29	29.3	27.9
14. Difficulty handling small items (e.g. coins, paper clips)	27	28.1	26.0
47. By age 7, still switches hands during activities.	27	27.3	26.0
45. Is awkward and large movements are clumsy.	27	26.4	26.0
36. Sometimes makes no attempt to catch himself when falling.	26	27.9	25.0
24. Extreme stiffness at any joint which limits function.	25	25.5	24.1
35. Appears to have poor overall body strength; is "floppy".	25	25.5	24.1
6. Difficulty with stairs (holds bannister, 2 feet/step).	24	24.7	23.1
27. Difficulty using scissors or cutting along a line.	24	24.0	23.1
7. Walks poorly with assistive devices.	23	24.8	22.1
31. When writing, doesn't stabilize the paper.	23	23.3	22.1
18. By age 8, has difficulty with simple homemaking tasks.	22	23.4	21.2
29. Holds pencil awkwardly; presses too hard or too lightly.	21	20.6	20.1
9. Needs help with use of wheelchair.	20	21.7	19.2
28. Difficulty handling a ball.	20	20.4	19.2
12. Stumbles & falls more frequently than others his age.	18	18.0	17.3
46. Poor sense of rhythm; can't do clapping games.	18	17.6	17.3
11. No reciprocal arm & leg movements when walking.	15	16.1	14.4
15. Has physical difficulties accessing a computer.	15	15.8	14.4
13. By age 8, has difficulty using a telephone.	14	15.1	13.5
16. Requires special adjustments to use a computer in class.	14	15.1	13.5
17. Has difficulty with doorknobs and faucets.	14	14.6	13.5
32. When using one hand, tenses or moves the other.	12	12.9	11.5
10. Cannot hop, jump, or heel-toe walk.	11	11.3	10.6
25. Too much movement in joints; seems double jointed.	9	9.5	8.7
8. Habitually walks on toes.	6	6.6	5.7

Note. "% of 104" refers to the total group of 104 respondents whose questionnaires were used in this study.

Continued

Teachers Scoring Items as Important on the Referral Part of the Scale, Expressed as Two Types of Percentages

Item	n	% of those responding	% of 104
37. Has trouble holding head up when sitting.	79	84.0	75.9
55. Can not repeat 3 words or numbers.	77	78.6	74.1
1. Is unable to manage toileting.	76	75.2	73.1
4. Needs assistance with self-feeding.	75	77.3	72.1
62. Doesn't express emotions appropriately.	75	74.2	72.1
3. Has difficulty with swallowing, chewing, or drooling.	73	76.0	70.2
53. Is hyperactive, very restless.	70	67.3	67.3
38. Slumps/slides forward in chair or wheelchair.	67	70.5	64.5
52. Is easily distracted; has a short attention span.	67	65.1	64.5
65. Does not recognize need to change behavior.	65	63.1	62.5
63. Is unaware of other's feelings & needs.	62	61.4	59.6
66. Difficulty with group participation; is uncooperative.	61	60.4	58.6
34. Doesn't allow others nearby; upset by unexpected touch.	58	59.1	55.7
39. Trouble keeping balance; adjusts posture	56	58.3	53.8
64. Difficulty communicating with peers or strangers.	55	53.9	52.9
5. Trouble changing clothes; difficulty with fastenings.	54	56.3	51.9
42. By age 8, still has number or letter reversals.	51	51.0	49.0
43. Difficulties copying shapes, numbers, or letters.	51	50.5	49.0
54. Difficulty communicating events sequentially.	51	50.0	49.0
56. Difficulty classifying or categorizing objects.	50	49.5	48.1
60. No strategy for solving simple problems.	50	49.5	48.1
57. Trouble applying concepts to a variety of situations.	49	48.0	47.1
61. Is easily frustrated or discouraged.	49	47.1	47.1
21. Rarely plays with other children; doesn't have friends.	48	47.5	46.1
36. Sometimes makes no attempt to catch self when falling.	48	51.1	46.1
51. Unable to draw 6 part person with body.	47	37.9	45.2
41. Difficulty copying from the blackboard.	45	44.5	43.3
22. Difficulty taking turns, sharing or following rules.	42	42.5	40.4
58. Does not recognize when help is needed.	42	42.4	40.4
6. Difficulty with stairs (holds bannister, 2 feet/step).	41	42.7	39.5
49. Confused about the meaning of directional words.	40	40.4	38.5
7. Walks poorly with assistive devices.	39	41.9	37.5
35. Appears to have poor overall body strength; is "floppy".	39	40.2	37.5
33. Loses place when reading; moves head.	39	39.4	37.5
9. Needs help with use of wheelchair.	38	41.3	36.6
44. Has trouble pasting one piece of paper on another.	38	37.7	36.5
26. Has a splint or brace that interferes with class work.	37	38.1	35.6
4. Has extreme stiffness at any joint which limits function.	47	37.5	35.1
59. Cannot identify strengths and limitations.	32	32.0	30.8
23. Does not play age-appropriate games.	31	31.0	29.8
30. By age 9, has difficulty spacing letters; is messy.	31	30.7	29.8
50. Difficulty imitating body postures &movements; doesn't cross the body midline.	33	33.3	31.4
12. Stumbles & falls more frequently than others his age.	33	33.0	31.7
48. By age 9, still confuses right & left on self or another.	32	32.7	30.8
2. By age 10, is messy and unkempt.	32	31.7	30.8

Item	n	% of those responding	% of 104
18. By age 8, has difficulty with simple homemaking tasks.	31	32.9	29.8
14. Difficulty handling small items (e.g. coins,paper clips)	29	30.6	27.9
40. Has difficulty with puzzles.	29	29.3	27.9
16. Requires special adjustments to use a computer in class.	27	29.4	26.0
47. By age 7, still switches hands during activities.	27	27.3	26.0
45. Is awkward and large movements are clumsy.	32	31.3	30.8
11. No reciprocal arm & leg movements when walking.	27	28.7	26.0
13. By age 8, has difficulty using a telephone.	27	29.0	25.9
27. Difficulty using scissors or cutting along a line.	26	26.0	25.0
15. Physical difficulties accessing a computer.	24	25.3	23.1
17. Difficulty with doorknobs and faucets.	24	25.3	23.0
10. Cannot hop, jump, or heel-toe walk.	23	24.0	22.1
8. Habitually walks on toes.	21	23.1	20.2
25. Too much movement in joints; seems double jointed.	20	20.8	19.2
28. Difficulty handling a ball.	18	18.1	17.3
46. Poor sense of rhythm; can't do clapping games.	16	15.7	15.3
29. Holds pencil awkwardly; presses too hard or too lightly.	17	16.5	16.3
31. When writing, doesn't stabilize the paper.	15	15.1	14.4
32. When using one hand, tenses or moves the other.	13	14.1	12.5

Note. "% of 104" refers to the total group of 104 respondents whose questionnaires were used in this study.

Teachers' Scoring of the Most Unimportant Items on the Impact Part of the Scale, Expressed as Two Types of Percentages

Item	n	% of those responding	% of 104
25. Too much movement in joints; seems double jointed	46	48.4	44.2
8. Habitually walks on toes.	34	37.4	32.7
11. No reciprocal arm & leg movements when walking.	33	35.5	31.7
13. By age 8, has difficulty using a telephone.	32	34.4	30.8
17. Difficulty with doorknobs and faucets.	31	32.3	29.8
10. Cannot hop, jump, or heel-toe walk	30	30.9	28.8
32. When using one hand, tenses or moves the other.	28	30.1	26.9
31. When writing, doesn't stabilize the paper.	27	27.3	26.0
16. Requires special adjustments to use a computer in class.	26	28.0	25.0
9. Needs help with use of wheelchair.	23	25.0	22.1
12. Stumbles & falls more frequently than others his age.	23	23.0	22.1
28. Has difficulty handling a ball.	21	21.4	20.2
29. Holds pencil awkwardly; presses too hard or too lightly.	21	20.6	20.2

Teachers' Scoring of the Most Unimportant Items on the Referral Part of the Scale, Expressed as Two Types of Percentages

Item	n	% of those responding	% of 104
25. Too much movement in joints; seems double-jointed.	39	40.6	37.5
31. When writing, doesn't stabilize the paper.	34	34.3	32.7
29. Holds pencil awkwardly; presses too hard or too lightly.	33	32.0	31.7
32. When using one hand, tenses or moves the other.	31	34.3	32.7
16. Requires special adjustments to use a computer in class.	25	27.2	24.0
13. By age 8, has difficulty using a telephone.	25	26.9	24.0
15. Has physical difficulties in accessing a computer.	23	24.2	22.1
46. Poor sense of rhythm; can't play do clapping games.	23	22.5	22.1

Note. "% of 104" refers to the total group of 104 respondents whose questionnaires were used in this study.