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Early speech and language intervention and the relationship to later academic progress

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EARLY SPEECH AND LANGUAGE INTERVENTION AND THE RELATIONSHIP TO LATER ACADEMIC PROGRESS

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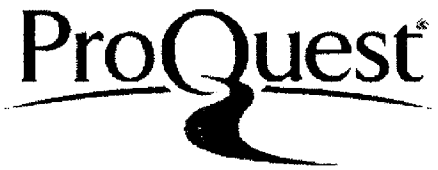

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Early Speech Language Intervention and the Relationship to Later Academic Progress (pp.)

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Recent research results have indicated preschool language disorders may be an early sign of subsequent learning disability. Although the results of early intervention research across various disciplines suggested age of intervention may be important to long range success, the relationship of early language intervention and subsequent learning disabilities has not been investigated. The purpose of the present study was to further examine the role of early language intervention on later academic proficiency.

A follow up was done on twenty children, currently in grade school, and originally treated for language disorder at the University of Montana Speech, Language, and Hearing Clinic as preschoolers. Subjects were divided into two equal groups: those who received initial treatment before age 3.5 years, and those who received initial treatment after 3.5 years of age. Parents, teachers, and school records were used as sources to gain data regarding the children's current academic progress.

Results indicated that while more children who received therapy before age 3.5 years made normal academic progress than those children treated after age 3.5 years, the difference was not significant. Results suggest that further prospective research is needed to more clearly establish the relationship between language disorder, language remediation, and learning disability.

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THE END.

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CHAPTER I

Introduction

Recent research results have revealed many children with learning disabilities also exhibit language disabilities of varying degrees (Griffiths, 1969; Rosenthal, 1970; Meier, 1971; Weiner, 1972, 1974; Hall, Tomblin, 1978; Aram and Nation, 1980; King, Jones, Lasky, 1982; Aram, Ekelman, Nation, 1984). A number of these studies have indicated preschool language disorders may be an early sign of subsequent learning disability. Although the results of early intervention research across various disciplines suggested age of intervention may be important to long range success (Isaacson, 1976; Lipton, 1976; Horton, 1976; Gray, 1984; Hoffman, Weible, Roach, 1984), the relationship of early language intervention and subsequent learning disabilities has not been investigated. If a relationship between early intervention and subsequent learning disability could be identified and described, this relationship might influence clinical decisions regarding whether or not early language intervention is helpful in alleviating future learning disabilities or in merely postponing them. The purpose of the present study was to further examine the role of early language intervention on later academic proficiency.

Chapter Overview

This chapter will center on the following topics: definitions of key terms; the relationship between learing disa-

bilities and language disorders; limitations of current research; the influence of early intervention,and clinical relevance of the present study.

Definitions

While the learning disabled are a highly heterogenous group, the learning disability label has often been applied to populations whose disabilities are of different origins, such as mental retardation or emotional disorders. The broad use of this label by some has led to confusion over what is a learning disability and what is not. In 1981, the National Joint Committee for Learning Disabilities agreed upon the following definition, which excludes handicapping conditions of different origin (Hammill, Leigh, McNutt, 1981).

> "Learning Disabilities is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual and presumed to be due to central nervous system disfunction. Even though a learning disability may occur concommitantly with other handicapping conditions (eg sensory impairment, mental retardation, social and emotional disturbances), or environmental influences (eg cultural differences, insufficient/ inappropriate instruction, psychogenic factors), it is not the direct result of those conditions or influences" (p336).

Language Disorders of Learning Disabled Children

Since learning involves communication with the environment, that learning disability has been linked to language disability is not surprising. Learning disabled (LD)

children demonstrate problems with both comprehension and production of language. Abstract semantic concepts, such as multiple representations (ie. one object can be represented by several language symbols) and pronouns, have been reported as being difficult for LD children (Gerber and Bryen, 1981; Wigg and Semel, 1976). Comprehension of more complex syntactic structures, such as negation, and passive construction, has also been shown to be a problem for this population (Gerber, Bryen, 1981; Wigg and Semel, 1976; Weiner, 1972; Rosenthal, 1970). Productively, LD children are able to maintain the meaning of a sentence without difficulty (Gerber and Bryen, 1980; Rosenthal, 1970). Syntactic complexity, however, has been identified as a major problem. These children are typically delayed in their use of morphological markers and transformations such as negatives and interrogatives, and tend to use the simplest strategy for generating the fewest and most general linguistic rules (Gerber and Bryen, 1981; Morehead and Ingram, 1973; Weiner, 1972; Rosenthal, 1970). In addition, LD children demonstrate word finding problems and circumlocutions (German, 1982; Gerber and Bryen; 1981; Wigg and Semel, 1976). LD children appear to demonstrate a variety of language disorders.

Learning Disabilities of Language Disordered Children

Thus far, the research cited has examined the language skills of children identified as learning disabled. Another body of literature investigated both the language and learning skills

of school age or older children who were initially identified as language disordered at preschool age. This research consistently indicated children diagnosed as having language disorders at preschool ages often exhibited both language and learning difficulties when they reach school age (Griffiths, 1969; Garvey and Gorden, 1973; Weiner, 1974; Hall and Tomblin, 1978; Bain, 1979; Aram and Nation, 1980; King, Jones, and Laskey, 1982; Aram, Ekelman, and Nation, 1984). Special services required for these children run the gamut from occasional tutoring to placement in class rooms for the mentally retarded (Griffiths, 1969; Garvey and Gordon; 1973, Hall and Tomblin, 1978; Bain, 1979; Aram and Nation, 1980; King, Jones and Laskey, 1982; Aram, Ekelman, and Nation; 1984). Development of adequate reading skills has also been identified as an especially difficult area for these children (Garvey and Gordon, 1973; Hall and Tomblin,1978; Bain, 1979; King, Jones, and Laskey, 1982).

The Relationship Between Learning Disability and Language Disorder

Clearly, children with language disorders are at risk for learning disability. Conversely, LD children appear to be at risk for language disorder. Perhaps these are not different groups of children at all, but are instead the same children on a developmental continuum. If this is true, such children may suffer from one underlying deficit which continues to be a problem throughout development. While it is

possible that an overall learning deficit disrupts both early language learning and later academic learning, evidence suggests the underlying problem is actually linguistic in nature. As noted earlier, language/learning disordered children typically display language deficits during both preschool and school age years. In addition, academic problems center especially around reading, which becomes more complex at each grade level and is a central factor in all education (Wiig and Semel, 1976). Reading is a linguistic skill. Vellutino (1980) noted five types of catagorical information are contained in the printed word: graphic, orthographic, phonologic, semantic, syntactic. Three of these five processes, phonology, semantics, and syntactics are linguistic processes. Thus, according to Vellutino "aquisition of skill in reading would appear to be especially vulnerable to abnormalities in one or more aspects of verbal functioning" (p. 569). Wiig and Semel (1976) agreed, stating that although not always visible in oral language, deficts in psycholinguistic abilities such as linguistic perception and transformations of syntactic structure and semantic information are "strongly related" to reading problems. Thus it may be that language disorder, manifested during preschool years in oral language, and later in academically related language, underlies these children's problems with learning both language and academics.

Limitations of the Literature Reviewed

The literature reviewed thus far suggested children with language disorders were at risk for LD. However, methodological weaknesses limit the conclusions and generalizations which can be drawn. First, the number of subjects examined was limited (20 or less) in five of these studies (Rosenthal, 1970; Weiner, 1972; 1974; Bain, 1979; Aram, Ekelman,and Nation, 1984). Such small subject groups make broad generalization of results to a whole population difficult (Kazdin, 1984). These results can be make stronger by replication (Kazdin, 1984). Second, a number of these studies included children who were highly variable in terms of their physical and intellectual status. Griffiths (1969); Garvey and Gordon (1973); Aram and Nation (1980); King, Jones, and Laskey (1982); and Aram, Ekelman, and Nation (1984) all included children with marked intellectual, motor, or hearing limitations in addition to LD. The inclusion of subjects with serious concomitant disorders make the conclusions drawn regarding the relationship between language disorders and learning problems much less clear. Further research, excluding subjects with concomitant disorders is needed to further clarify the nature of the language disorder/LD relationship. Finally, the role of language therapy has virtually been ignored by this body of research. Rosenthal (1970); Mier (1971); Weiner (1972); and Garvey and Gordon (1973) did not indicate whether their subjects ever

received any kind of therapy. All of the subjects used by Griffiths (1969); Weiner (1974); Hall and Tomblin (1978); King et al (1982); and Nation et al (1984) received some kind of speech/language therapy, but no attempt was made to examine the role of that therapy on later language and learning skills. Only two studies have examined the role of therapy in any detail. Aram and Nation (1980) considered duration of therapy. No relationship was found between duration of therapy and later academic progress. Bain (1979) examined the age of speech/language intervention. Results revealed, in general, children who received language therapy before the age of four made normal academic progress, while those treated after age four exhibited a variety of academic problems including the need for additional language therapy, resource room services, grade retention, and special classroom (such as LD) placement. Early speech/language intervention then, may have some positive effect on later academic progress. Clearly, the role of specific therapy factors needs to be examined more thoroughly.

Early Intervention: Rationale

Early intervention had it's roots in the 1950's. Research results at that time demonstrated the beneficial effects of early stimulation for both animals and humans (Bronfenbrenner, 1975, Tjossen 1976; Hoffman, 1984). Additional support for the concept of early intervention was found in the research investigating the plasticity of the

central nervous system during infancy and early childhood. According to Issacson (1976), research indicated a tendency for very young children to recover from brain damage more completely than older individuals. This may be related to the brain still actively adding new cells until a child is approximately two years of age (Lipton, 1976). After the number of cells become stable, they continue to grow, differentiate and become mylenated through age six (Lipton, 1976). During the early years of childhood then, the central nervous system is still highly flexible or "plastic". According to Lipton:

> "The capacity of learning and memory is made possible by the plasticity of the central nervous system. Neurons may elaborate new dendrites and terminals, or they may alter the capacity to synthesize transmitters...Growth and maturation of the nervous system are regulated by a genetically programmed readout. The environment in which the animal resides after birth determines whether these potentialities will be realized and the exact form it will take" (p.71).

From this Lipton concluded optimal periods for learning must exist in man. The first few years of life have been identified as especially important for language learning (Horton, 1976; Bloom and Lehey, 1978; Miller, 1981). Although children have minimal verbal output through age two, they are in the process of learning language, listening and responding to the verbal language of others (Lloyd 1976). By age three and one half to four years, most children have acquired most of the verbal skills and structures that serve the mature use of

language (Horton, 1976; Miller, 1981).

Reports of extreme deprivation during early childhood indicated adverse early life experience may have serious lasting effects on the development of language (Rutter, 1981). Seven well documented cases of early deprivation (Davis, 1940; Mason, 1942; Koluchova, 1976; Curtiss, 1977; Douglas and Sutton, 1978; Skuse, 1984) described both the early deprivation, the skills of the children involved, and their subsequent development with intervention. All of the children were profoundly delayed in language development upon discovery. Six of these children went on to develop near normal language skills with language intervention (Mason, 1942; Koluchova, 1976; Douglas and Sutton, 1978; Skuse, 1984). Three however, continued to exhibit severe expressive and receptive language delays. In a review of these case studies, Skuse (1984) noted these three children demonstrated complete absence of comprehensive and expressive speech upon discovery, while the other six children demonstrated some minimal language skills. Apparently these three children had no opportunity to learn any language during the primary language learning years (Davis, 1947; Curtiss, 1977; and Skuse, 1984) Although some language gains were made by these three children after discovery, language therapy did not compensate for this deficit completely. Age of discovery of these three children, which ranged from 2.4 to 13.7 years, did not appear to influence results. Intelligence was also excluded as a reason these children demonstrated limited

improvement. All of the children in the seven cases had non-verbal intelligence within normal limits. It appears then, that the acquisition of at least some language skills during the early years of life may be related to the future development of normal language.

The concept of central nervous system plasticity (Issacson, 1976; Lipton, 1976), along with evidence that the early years of life may be critical to language learning (Davis, 1947; Horton, 1976; Curtiss, 1977; Bloom and Layhey, 1978; Miller, 1981; Skuse, 1984) suggested children are best equipped to learn language in the first 3-4 years of life. If this is true, then the optimum time for the provision of language intervention would be during this period. Although language learning continues to occur after this time, the older child's system may not be as capable of learning language as the younger child's.

The first three to four years of life, then, are especially important to language development. Early intervention not only takes advantage of these years, it is also economical over time. Garland, Stone, Swanson,and Woodruff, (1980) found preschool programs created savings from $9,000 to $10,000 dollars per child for the cost of his or her education to age 18. Costs were less because children who received early intervention required less costly forms of education, and generally required less special education placement as they progressed through school than students who did not have early education (Smith, 1981). In addition, early interven-

tion was assessed to be less expensive than later intervention. Wood (1981, as cited in Dark, 1984) calculated the cost of providing early intervention, and found it to be ten to twenty thousand dollars less per child than the intervention that would otherwise be necessary when these children reached school age. A number of other research result supported these findings (Weber, Foster, Weikart, 1978; Weikart, 1980; as cited in Dark, 1984). The rationale for early intervention is two fold: early intervention takes advantage of the "plastic" early years of development, and it is assumed to be more economical than later intervention.

Research in Early Intervention

As noted earlier, the effects of early language intervention have not been thoroughly examined. Early intervention research for other abilities however, provides some information about early intervention's effectiveness in general. The majority of this research focused on preschool education of the economically deprived and the developmentally disabled. Initial results were not encouraging. A review of a wide variety of preschool intervention programs such as Project Head Start indicated that although initial gains (as measured on intelligence tests) were substantial, they were not maintained upon the termination of intervention (Bronfenbrenner, 1975; Tjossen, 1976). A number of methodological problems and consideration however, suggested these results must be viewed with caution. Bronfenbrenner (1975)

noted problems such as subject bias and regression to the mean which may have effected the results of many of the studies reviewed. The inclusion of developmentally delayed children in groups of economically deprived children (Bronfenbrenner, 1975) may also have influenced results. The subjects were two distinctly different groups of children, and the level of progress made by one group may have overshadowed that make by the other. Furthermore, this initial body of early intervention research only examined intelligence (Bronfenbrenner, 1975; Gray, 1984), and therefore other types of gains may have been overlooked. Finally, the preschool intervention programs reviewed by Bronfenbrenner (1975), and Tjossen (1976), involved programs that provided only general stimulation. Yet Tjossen (1976) noted as many as 50% of the subjects in these programs were speech or hearing impaired, and for these children, there was little specific emphasis on the specific disorder.

Careful examination of early intervention literature, especially more recent research, revealed a number of studies have addressed some of these issues. Gray, Ramsey, and Klaus (1982) followed the progress of 60 economically deprived children, originally involved in the Early Training Project, for seven years post intervention. Like earlier studies, these researchers found IQ gains were not maintianed over time. However, results indicated the children involved in these studies demonstrated significantly better academic achievement, especially in reading, than did the control

children. In addition "experimental and control groups differed significantly on the percentage assigned to special education" (p. 71, Gray,1984). The research results of Deutsch (1981, as cited in Hoffman, Weible, Roach, 1984) confirmed children who participated in early intervention programs demonstrated "higher educational achievement and enhanced ability to cope with later life problems than controls" (p.407). Clearly, consideration of other types of gains than IQ revealed children did indeed benefit in the long run from early intervention.

In considering the problem of direct versus general stimulation, another body of early intervention research is of interest. Bronfenbrenner (1975) not only reviewed preschool programs, but also parent/child intervention in the home. Results of these studies revealed children made enduring IQ gains. Tjossen (1976) interpreted these findings as evidence for the effectiveness of a more direct approach (ie. mother child interaction was more directive than teacher child interaction). Follow up studies other than those reviewed by Bronfenbrenner were not available. Studies examining the immediate results of therapy however, indicated direct intervention facilitated progress more than indirect intervention (Horton, 1976; Barrera, Routh, Parr, Johnson, Arendshorst, Goolsby, and Schroeder, 1976), especially with children who were generally functioning at lower levels (Friedman and Friedman, 1980). In conclusion, when areas other than IQ were examined, and factors such as more direct

intervention considered, early intervention was found to be effective and enduring. The question of whether or not these results are generalizable to language intervention has yet to be addressed.

Clinical Relevance of Early Language Intervention

Research results have shown a relationship between language disorder and learning disability and evidence suggests language disorder may be the underlying causal problem. Is there a way to minimize the impact of a language disorder on subsequent academic performance? Early intervention has been shown to have positive, long term effects in other areas. Would early language intervention be helpful in alleviating future learning disabilities, or in merely postponing them. If remediation is found to be more beneficial at an early age, clinicians may need to change their practice of seeing older children first and waiting to see if communication disorders in young children decrease with maturation (Bain, 1979). The purpose of the present study was to further examine the role of early language intervention on later academic proficiency. Specifically, is there a significant difference between children who initially received language therapy before age 3.5 years and those who initially received language therapy after age 3.5 years with regard to academic progress and success.

CHAPTER 2

Method

Subjects

Preschool children evaluated for communication disorders at the University of Montana Speech, Language, and Hearing Clinic from 1976 to 1983 served as potential subjects. Information from the clinical record was used to determine the child's appropriateness for inclusion in this study. Criteria for subject selection were as follow:

1. The child was diagnosed as having a language disorder by a certified or licensed speech language pathologist. Children diagnosed as having a phonological/articulation disorder only were excluded.
2. The child received language therapy at the University of Montana during his preschool years (18 months to 6 years), with therapy initiating either before age 3.5 years or after age 3.5 years.
3. The child had no known mental retardation, neurological involvement, or sensorineural hearing loss according to clinic record.
4. The child had completed kindergarten, but was still attending elementary school in the Missoula, MT area. In the state of Montana, a child may be classified as Learning Disabled (L.D.) at any age if a severe discrepancy is found to exist between achievement and intel-

lectual ability in one or more of the following areas: oral expression; listening comprehension; written comprehension; basic reading skill; reading comprehension; mathematics calculation; or mathematics reasoning (OPI Special Education Manual, 1985). This last criterion assured children had been in grade school long enough for their skills to be known. It is importent to note that Public Law 94-142, which mandates public education for handicapped children, was not effective until 1978. Thus subjects in school may have received different classifications before and after this date.

Additional information regarding sex, socioeconomic status, articulation skills, type and severity of language disorder, and duration and type of language therapy was also obtained from the clinical record to describe the subjects in more detail (Appendix A). Potential subjects were divided into two groups: those who received language therapy before age 3.5 years and those who received language therapy after age 3.5 years. Ten subjects were identified for each group and telephone contact was made with parents in May, 1985. The purpose of the study was explained, and permission was obtained to include the child in the study (Appendix B). School personnel were then contacted, and permission was obtained to examine the child's records regarding classroom placement and achievement testing.

Follow Up Information

Information on the 20 children's academic progress came from four sources: a telephone interview with the subject's parents, a follow- up-questionnaire completed by the subject's teacher, school records of classroom placement and special services received and academic achievement test results.

Telephone Interview With Parents

A structured telephone interview was conducted with each subject's parents (Appendix C). Parents were asked to provide information regarding history of special services, previous educational placement, and current educational placement. This information was used as one source to determine if a child had been making normal academic progress. If the child attended regular class in either private or public school, and had no grade repetitions, resource room services, or special tutoring needs, s/he was judged to be making normal academic progress. Whether or not a child had recieved language therapy was not considered in making the judgement of normal academic progress. Children who repeated a grade, who had been assigned to a special class, or who had recieved remedial work in any subject were considered as not making normal academic progress. In addition, questions focusing on subject areas identified as difficult for learning disabled children were asked (for example, reading). Each parent was asked to rate his/her child's performance for

a particular subject on a five point continuum beginning with "excellent performance "and ending with "serious problem". Ratings on the high two points of this scale were considered indicative of normal academic progress, ratings on the center point of the scale were considered neutral, and ratings on the lower two points of the scale were considered indicative of abnormal academic progress. Parents were also asked to rate their child's overall academic performance.

Questionnaire to Teachers

Each child's current teacher was mailed a questionnaire and an explanatory cover letter (Appendix D) if the child had been under that teacher's direction for a minimum of two months. This criteria assured the teacher involved was familiar with the child's skills. Each teacher was asked to provide information regarding the child's current educational placement , and this information was used to determine if the child was making normal educational progress in the same manner as the parent interview. Teachers were also asked to rate the child's performance on specific subjects, and on overall academic achievement. The rating scale and protocol for determination of academic progress was the same as that used on the parent interview.

Academic Records

Each child's academic record was reviewed by the examiner (Appendix E). The child's cumulative educational folder

provided information regarding grades completed, promotion and retention. If a child recieved special services, the annually written Child Study Team Report was also reviewed. This report provided information specifying which special services had been provided to the subject over past years. These data were also used to determine whether the child was making normal educational progress in the same manner as the parent interview.

Achievement Tests

Each child's cumulative educational folder also contained yearly results of the Science Research Associates (SRA) Achievement Test, or the Iowa Basic Acheivement Test. Cumulative reading and math scores, reported as national percentile standings, were obtained for 1984 administration of the test to each subject. Although scores of the two different tests were not compared directly, a child was judged as making normal academic progress if he scored at the 15th percentile (within one standard deviation) or above on either test. If he scored below this percentile he was judged as making abnormal academic progress. Local percentile scores and grade level equivalent scores were obtained for descriptive purposes.

Summary of Measurements Obtained

Based on the information provided by the parent interview, each child's academic progress was rated as normal or abnormal, according to the previously stated criteria, in the

following catagories:

1. Academic progress overall
2. Academic progress in specific subject areas.
    a. Reading
    b. Writing
    c. Math
    d. Science
    e. Social Studies
    f. English/Grammar
    g. Literature
    h. Art
    i. Music
    j. Physical education
3. Speech/Language Skills

The information provided by the teacher questionnaire was organized in an identical manner. Each child was also rated (according to previously stated criteria) as making normal or abnormal academic progress based on the information obtained from the academic record, catagorized as follows:

1. Achievement Test national percentile rankings for reading and math.
2. Academic Progress Overall

The number of children receiving each rating (ie. normal/abnormal) in each catagory (ie. reading, math, etc.) and within each information source (ie. parent report, teacher report, academic records) was calculated for each group (ie.

pre age four/post age four). A comparison between the groups was then made for each catagory within each information source.

Reliability

The protocol for obtaining data and determining academic progress were outlined under Information Obtained, and in the listed appendices. Reliability of the researcher's scoring of parent/teacher ratings of their children/students was determined by having a graduate student analyze and score data for three randomly selected subjects from each group. Point by point reliability was from 83 to 100%, with an average of 95% agreement. Point by point comparison is shown in Appendix H. Data regarding the subject's original status was taken from past clinic files. No reliability data was available on this information.

Analysis

The Fisher Exact Probability Test (Seigle, 1956) was utilized to determine if a significant difference existed between group I and group II regarding overall academic progress (ie normal progress versus abnormal progress). Other data was analyzed and discussed descriptively.

CHAPTER III

Results

The result section describes the subjects and then addresses the research question. In addition, trends and relationships between group I, those children who began treatment before 3.5 years of age, and group II, those children who began treatment after 3.5 years of age, regarding specific academic areas are examined descriptively.

Description of Subjects

The initial subject pool of 140 possible subjects (ie children treated at the University of Montana between 1976 and 1983 for language disorder) was exhausted to gain the 20 subjects utilized. Fifty five of the subjects were rejected on the basis of concomitant disorder (hearing loss, mental retardation, neurological), thirty subjects were of inappropriate age, and thirty five subjects were no longer living in the area. Each group contained ten subjects. Table one shows the distribution of subjects in the two groups in terms of sex, year of initial preschool treatment, chronological age at initial preschool treatment, age range at the time of follow up, and occurrence and duration of school therapy. There were 4 to 1 more males than females in group I, while the ratio was equal (1 to 1) in group II. The year in which initial preschool treatment was received was similar for both groups, ranging from 1974-1982. Chronological age at the time of treatment was 2.0 to 3.3 years for group I, and 3.6 to 5.8 for group II. Age range at the time of follow up was

Table 1. Distribution of subjects in each group in terms of sec, age range at initial preschool treatment, age range at follow-up, date of initial preschool treatment, occurrence and duration of therapy after entering school

GROUP #1: Treatment Pre 3.5 Years of Age

Subject #	Sex M	Sex F	Age At Initial Treatment	Age At Initial Treatment	Date of Initial Preschool Treatment (Summarized for Both Groups) 1974	75	76	77	78	79	80	81	82	Occurrence of School Therapy (Summarized)	Duration of School Therapy
1.	X		2.6	6.0											1 year
2.	X		2.5	9.6											None
3.	X		3.0	12.1											Unknown
4.		X	3.0	7.1											2 years
5.		X	3.2	8.1	0	2	0	1	2	0	2	3	0	7	2 years
6.	X		3.3	10/9											None
7.	X		2.2	6.8											None
8.	X		2.0	6.5											3 months
9.	X		3.1	11.0											4 years
10.	X		3.3	13.3											4 years
TOTAL:	8	2	2.0-3.3 years	6.0-13.3 years										7	3 months-4 years

GROUP #2: Treatment Post 3.5 years of Age

1.	X		3.7	7.0											None
2.	X		3.7	14.4											Unknown
3.	X		4.11	12.3											5 years
4.		X	3.9	9.1											None
5.		X	4.4	14.2	1	1	1	0	1	2	0	3	1	5	None
6.		X	3.6	9.7											None
7.	X		5.8	9.9											Unknown
8.		X	4.9	8.0											2 years
9.		X	5.2	8.11											None
10.	X		3.7	12.5											7 years
TOTAL:	5	5	3.6-5.8 years	7.0-14.4 years										5	1-5 years

also similar for both groups. Group II subjects, 7.0 to 14.5 years of age, were slightly older overall than group I children, 6.0 to 13.3 years of age. Seven of the ten children in group I and five of the ten children in group II received speech/language therapy after entering school. Duration of school therapy ranged from 3 months to 4 years for children in group I, and 1 to 5 years for children in group II.

Table II shows the distribution of subjects for both groups in terms of diagnostic category, severity of disorder, and duration and type (group/individual) of therapy. Again, the two groups appeared similar. For group I, 6 children were diagnosed as having mild or moderate expressive delays, while in group II, 7 children were diagnosed as having mild or moderate expressive delays. In the receptive/expressive diagnostic category, three subjects were diagnosed as having a moderate delay, and one subject a severe delay in each of the two groups. Thus severity of disorder did not appear to influence whether the children were initially seen for therapy at an earlier age (pre 3.5 years), or a later age (post 3.5 years). In comparing the two groups in terms of duration of therapy, the majority of children in both groups received preschool therapy for one to twelve months. Three children in each group received therapy for more than twelve months. When duration of therapy was considered in terms of severity of disorder, children diagnosed as mildly delayed seemed to receive therapy for less than twelve months (see table III).

TABLE II. Distribution of Subjects in Each Diagnostic Category in Terms of Severity of Disorder and Duration and Type of Therapy.

Group I Pre 3.5 yrs.	Severity			Duration			Type		
	Mild 6-12 mos.delay	Moderate 1-2 yr.delay	Severe +2 yr.delay	6 mos.	6-12 mos.	1 yr.	Individual	Group	Group and Individual
Expressive	3	3	0	4	0	2	1	2	3
Receptive	0	3	1	1	2	1	1	0	3
TOTAL	3	6	1	5	2	3	1	2	6

Group II Post 3.5 yrs.	Mild	Moderate	Severe	6 mos.	6-12 mos.	1 yr.	Individual	Group	Group and Individual
Expressive	3	3	0	1	3	2	3	0	3
Receptive	0	3	1	2	1	1	3	0	1
TOTAL	3	6	1	3	4	3	6	0	4

GROUP #1: Children Receiving Initial Treatment Before Age 3.5 Years.

Group #2: Children Receiving Initial Treatment After Age 3.5 Years.

TABLE III. Distribution of Duration of Therapy (In Months) for Children With mild, Moderate, and Severe Disorders for Groups I and II.

Group	Mild Therapy Duration		Moderate Therapy Duration		Severe Therapy Duration	
	1-12 months	+12 months	1-12 months	+12 months	1-12 months	+12 months
I Pre 3.5 years	3	0	3	3	1	0
II Post 3.5 Years	3	0	3	3	1	0

Children diagnosed as moderately delayed were evenly distributed across both groups for therapy duration periods. Children for both groups diagnosed as severely disordered received therapy for less than twelve months. The short duration of therapy received by these children may be explained by a review of their records, which indicated they were not dismissed by therapists, but removed from therapy by their parents. Further inspection of table two revealed the majority of children (8) in group I received group, or group and individual therapy, whereas more children (6) in group II received individual therapy. This may be due in part to the fact that from 1977 to 1981, the University of Montana Speech, Language, and Hearing Clinic received a grant to conduct a preschool group experience, the Early Childhood Language Intervention Program (Eclip). Language disordered children were typically placed in this program regardless of the specific nature of their disorder. Therefore, a specific comparison between groups regarding type of therapy received could not be done. The Eclip program emphasized a reactive therapy approach (modeling and parallel talk). Other approaches noted in the clinic records included behavior modification, and imitative modeling. Appendix F contains specific therapy information for individual subjects.

The Research Question: Normal versus Abnormal Academic Progress

A child was judged as making normal academic progress if

he/she attended regular class, had no grade repetitions, resource room services or special tutoring needs. Children who repeated a grade, who had been assigned to a special class, or who had required remedial work in any subject were judged as not making normal academic progress. Results indicated in group I, five children made normal academic progress, while five children did not. In group II, two children made normal academic progress, while eight did not. Non parametric statistical procedures, Fisher Exact Probability test (FEPT, $p>.05$ Seigel 1956), indicated although more children treated for language disorders before 3.5 years of age had normal academic progress than those who began treatment after 3.5 years of age, this difference was not statistically significant.

Specific Academic Information From Parents and Teachers

Data regarding academic progress in specific subject areas was used to further describe the nature of the subjects overall academic progress. Appendix G contains the specific data for each subject. Tables IV and V summarize results of parent and teacher ratings of their child or student's academic progress as normal or abnormal in specific subject areas. The "unknown" category was used both when the reporter did not know the child's skills, and when the subject was not in a particular child's curriculum. Parents responded using the unknown category more often than did

TABLE IV. Distribution of the Number of Children Judged by Parents to be Making Normal or Abnormal Academic Progress in Specific Subject Areas.

Group	Reading			Writing			Writing Coordination			Spelling			Math			Story Problems (Math)			Science			Social Studies		
	+	-	U	+	-	U	+	-	U	+	-	U	+	-	U	+	-	U	+	-	U	+	-	U
I	7	3	0	8	2	0	6	3	1	5	2	3	7	3	0	3	1	6	5	1	4	6	1	4
II	5	5	0	5	5	0	4	6	0	2	6	2	6	4	0	2	3	5	7	2	1	7	2	1

Group	English/ Literature			Overall Academic		
	+	-	U	+	-	U
I	4	2	4	8	2	0
II	2	6	2	6	4	0

+ = Normal Academic Progress
- = Abnormal Academic Progress
U = Unknown or Not Applicable

GROUP #1: Children Receiving Initial Treatment Before Age 3.5 Years.

GROUP #2: Children Receiving Initial Treatment After Age 3.5 Years.

TABLE V. Distribution of the Number of Children Judged by Teachers to be Making Normal or Abnormal Academic Progress in Specific Subject Areas.

Group	Reading			Writing			Writing Coordination			Spelling			Math			Story Problems (Math)			Science			Social Studies		
	+	-	U	+	-	U	+	-	U	+	-	U	+	-	U	+	-	U	+	-	U	+	-	U
I	7	3	0	5	4	1	5	3	2	4	3	2	8	2	0	6	2	2	7	3	0	7	3	0
II	5	5	0	6	4	0	3	6	1	6	4	0	7	3	0	4	5	1	7	2	1	7	2	1

Group	English/ Literature			Overall Academic		
	+	-	U	+	-	U
I	6	1	3	7	3	0
II	1	4	5	5	5	0

+ = Normal Academic Progress
- = Abnormal Academic Progress
U = Unknown or Not Applicable

GROUP #1: Treated Before Age 3.5 Years

GROUP #2: Treated After Age 3.5 Years

teachers. Ratings throughout were considered similar if within one point of each other, and dissimilar if more than one point from each other. A comparison of tables IV and V revealed overall high agreement between parent and teacher ratings. Specific exceptions to this are noted below.

Slightly more subjects in group I were rated by their parents and teachers as making normal academic progress in reading (7 normal [+], 3 abnormal [-]), than in group two (5+, 5-). Ratings in English/Literature also reflected this distribution. More children in group I were rated by their parents and teachers as making normal academic progress (parents: 4+, teachers: 6+) than in group II (parents: 2+, teachers: 1+).

Ratings of writing skills were less consistent between parents and teachers. Parents of the children in group I rated more children as having normal writing skills than parents of the children in group II (group I, 8+, group II, 5+). Teachers of the children in group I however, rated essentially the same number of children as making normal progress in writing as did the teachers of the children in group II (group I: 5+, group II: 6+). Writing coordination was rated similarly by both parents and teachers, with slightly more children in group I (parents: 6+, teachers: 5+) rated as having normal writing coordination than group II children (parents: 4+, teachers: 3+).

In spelling, parents and teachers of the children in group rated the children similarly (parents: 5+, teachers

4+). The parents of the children in group II however, rated only two children as making normal progress in spelling, while these children's teachers indicated six children made normal progress.

In rating math overall for both group I and II children, parents and teachers agreed. Teachers of the children in group I rated eight children as making normal academic progress, and the parents of these children rated seven as making normal progress. Similarly, teachers of the children in group II rated seven children, and parents rated six children, as making normal progress in math overall. The skills of the children in group I and group II were less similar when parents and teachers rated performance on math story problems. The parents of the children in group I rated the children 3+, 1-, and teachers rated the children 6+,2- . Fewer children in group II were rated by their parents and teachers as making normal progress (parents: 2+, 3-, teachers: 4+, 5-).

In both science and social studies, parent and teacher rating were again in overall agreement. Groups I and II were rated very similarly, with the majority of children in each group rated as making normal progress in these areas. Parents and teachers both rated the majority of children as making normal progress in non-academic areas: art, music, and physical education.

Finally, parents and teachers rated each child's academic skills overall. Results indicated that again, slightly

more children in group I were rated by both their parents (8+, 2-) and teachers (7+, 3-) as making normal academic progress than were children in group II (parents: 6+, 4-, teachers: 5+, 5-).

In summary, both parents and teachers rated slightly more children as progressing normally in group I than children in group II in reading, English/literature, writing coordination, math story problems, and academics overall. Parent and teacher ratings of children's writing overall and spelling were less consistent with each other. In both cases, parents of the children in group I rated more children as making normal progress than did the parents of the children in group II, while teachers ratings of the groups were more equal. Finally, parents and teachers consistently rated a similar number of children in both group I and group II as making normal academic progress in the subjects of overall math, science, social studies, and non-academic subjects.

Speech/Language Information from Parents and Teachers

Tables VI and VII show the distribution of children judged by parents and teachers to be using normal or abnormal speech and language in various categories. In rating their children's speech and language skills, parents and teachers differed slightly. Teacher's ratings appeared to be slightly more stringent overall than were parent's. Both parents and teachers however, were consistent overall in rating the children's skills in both groups as very similar, with the

TABLE VI. Distribution of the Number of Children Judged by Parents to be Using Normal or Abnormal Speech and Language.

Group	Answers Questions Appropriately		Tells Story/Event Appropriately		Adequate Vocabulary		Use of Complete Sentences/Correct Grammar		Overall Comprehension		Follows Directions	
	+	-	+	-	+	-	+	-	+	-	+	-
I	9	1	9	1	8	2	9	1	10	0	9	1
II	9	1	6	4	8	2	9	1	9	1	8	2

Group	Fluency		Articulation		Speech/Language Overall	
	+	-	+	-	+	-
I	10	0	5	5	10	0
II	9	1	6	4	7	3

+ = Normal Skills
- = Abnormal Skills

GROUP #1: Treated Before Age 3.5 Years

GROUP #2: Treated After Age 3.5 Years

TABLE VII. Distribution of the Number of Children Judged by Teachers to be Using a Normal or Abnormal Speech and Language.

Group	Answers Questions Appropriately		Tells Story/Event Appropriately		Adequate Vocabulary		Use of Complete Sentences/Correct Grammar		Overall Comprehension		Follows Directions	
	+	-	+	-	+	-	+	-	+	-	+	-
I	8	2	7	3	7	3	7	3	6	4	9	1
II	6	4	7	3	7	3	8	2	6	4	9	1

Group	Fluency		Articulation		Speech/Language Overall	
	+	-	+	-	+	-
I	9	1	6	4	5	5
II	9	1	5	5	5	5

+ = Normal Skills
- = Normal Skills

GROUP #1: Treated Before Age 3.5 Years.

GROUP #2: Treated After Age 3.5 Years.

exception of two instances, both noted below. Parents of the children in both groups rated nine of the ten children in each group as answering questions appropriately. Teacher ratings across groups differed slightly, with the teachers of the children in group I rating more children as answering questions appropriately (8+, 2-), than did the teachers of group II children (6+, 4-). Under the category of story telling/event description, parents rated their children in groups I and II differently (group I: 9+, group II: 6+), while teachers rated the groups the same. For the categories of adequate vocabulary usage; use of correct grammar and complete sentences; following directions; and fluency; both parents and teachers rated the majority of children in both groups I and II as having normal skills. In rating overall comprehension, parents of the children in both groups rated the children as having overall normal skills, while teachers were more stringent, rating six children as having normal skills and four children as having abnormal skills in both groups. Both parents and teachers of the children in both groups agreed articulation was still a problem for some children. Parents of the children in group I rated five children as having articulation problems, and parents of the children in group II gave this rating to four children. Teachers of the children in group I rated four children, and teachers of the children in group II rated five children as having continued articulation problems. When rating speech and language overall, parents, in spite of their tendency to

rate both groups equally in individual categories, rated more children in group I as having normal speech and language skills (10+) than group II (7+). Teachers, again more stringent, rated the groups equally, with five children in each group rated as having normal speech and language skills.

School Record Data

Achievement Scores

1984 SRA and Iowa Basic achievement scores were obtained for ten children in group I, and five children in group II. Three group II children were not tested because of their special education placement, and no scores were available for two children who were in different school districts. In group I, ten of ten subjects scores fell within normal limits (+/- one standard deviation) for reading, while in group II, four of five children fell within the normal range. For math, eight of ten group I children scored within normal limits, while four of five group II children scored within normal limits. The difference in group sizes makes comparisons between groups difficult. If the three special education children not tested in group II had been tested, these children may have performed below normall limits. If this were true, group I would have more children within normal limits than would group II. Based on the actual scores available however, the groups do not appear to differ greatly.

Learning Disability Classification

A review of special education records revealed of the five children not making normal academic progress in group I, four had been classified LD. Of the eight children not making normal academic progress in group II, five children were classified as LD. Thus in terms of the number of children receiving an LD classification, group I and group II were similar.

CHAPTER IV

Discussion

Parents of children having language disorders of unknown etiology diagnosed during their preschool years were contacted. The follow up contact was made after the children were of school age and had completed a minimum of kindergarten. The children were divided into two groups. Group I consisted of children who had received language therapy before the age of 3.5 years, and group II consisted of children who received language therapy after age 3.5 years. This division allowed a comparison of age of preschool intervention to occurrence of subsequent learning problems or disabilities. The discussion of the results of this comparison is organized under the following headings: Overall Academic Progress; Specific Subject Areas; Assessment Considerations; Parent/Teacher Ratings, Future Research Suggestions, and Conclusions.

Overall Academic Progress

The findings of this study were similar to the results of Griffiths (1969), Hall and Tomblin (1978), Bain (1979), Aram and Nation (1980), King, Jones, and Laskey (1982), and Aram, Ekelman, and Nation (1984), in that some children diagnosed as language disordered as preschoolers had later academic difficulty, while other children with the same original diagnosis did not. Comparison of group I and group II revealed that although the subjects in both groups received

similar treatment as preschoolers, slightly more children who received initial treatment before age 3.5 years (group I) made normal academic progress than did those children who received initial treatment after age 3.5 years. This difference is consistent with Bain's (1979) finding that more children who received intervention before age four years made normal academic progress than did those children receiving therapy after age four years. Such a pattern may indicate that age of initial language intervention may reduce later incidence of learning problems. However, when examined statistically, the difference between groups was not significant in either the present study or Bain's study.

There are several problems with this research and retrospective research in general which may account for the finding of no significant difference between the two groups. First, it is possible no such significant difference actually exists. It is more likely however, that the limited number of subjects in each group (10) precluded a significant difference being shown. Further, this study, as was Bain's, was retrospective in design. Such designs limit the researchers ability to control variables. In this study, such variables included the nature of the assessment/diagnoses process, and the specific nature of therapy. Olswang and Bain (in Press) noted that in terms of assessment, "generally language impaired children look very similar to normally developing children of the same mental age" (p. 23). It may be difficult to differentiate the child who is truly language

disordered from the child who is functioning at low normal levels of development with the assessment tools currently available to clinicians. Thus it is possible that subjects were included in this study who were not truly language disordered, but simply slower in overall development. The inclusion of such children in this study would contaminate the two groups, making comparison difficult. In addition, the initial assessment data was not subject to reliability checks.

Specific Subject Areas

Information gained from both parents and teachers regarding subject's progress in specific subject areas was consistent with the findings regarding overall academic progress. Slightly more children in group I were rated as making normal academic progress in reading and reading related areas (English/literature, mathematical story problems) than were group II children. In the subject areas requiring little or no reading at grade school levels (math overall, science, social studies, music ,physical education and art), children in both groups were rated as performing equally well overall These findings have two possible implications. First, the findings may indicate learning/reading problems are indeed linguistically based. The finding that some children diagnosed as language disordered as preschoolers have later academic problems that are primarily reading related has also been reported by Aram and Nation (1978), Bain

(1979), and King, Jones and Laskey (1982). As discussed earlier, evidence suggests a strong relationship between language deficits and reading problems. Of the five types of data contained in the printed word (graphic, orthographic, phonologic, semantic, syntactic), three are linguistic processes. Thus academic skill in reading and reading related areas is especially vulnerable to abnormalities in one or more aspects of linguistic functioning.

Second, although the difference was not statistically significant, more children in group I were rated as making normal academic progress than were children in group II. This may suggest age of language intervention may have decreased later incidence of reading difficulties. If this is so, however, one must question why the children in both groups were rated as having similar speech and language skills at the time of follow up. One explanation for such a finding is group I children's language problems may not have been remediated, but instead, the children have been taught to compensate for their language problems. According to Minskoff (1976), psycholinguistic abilities can be ameliorated but not cured, and therefore remediation should be coupled with the training of compensation skills. Taking this view further, Newcomer and Hammill (1976) found, following a review of psycholinguistic training literature, no evidence to support that specific psycholinguistic abilities could be trained. If this is true, speech/language therapy may not result in remediation, but may result in better

compensation skills. The children in this study who received language therapy before age 3.5 may have better learned to compensate for their speech/language problems, and have thus developed better reading skills than those children who received language therapy after age 3.5 years.

Assessment Issues

As discussed earlier, the assessment tools currently available for evaluating language development may not allow for differentiation between children who are truly language disordered and children functioning at low normal levels of development. The nature of the assessment tools used may also have effected the results of this study in two other areas. First, comparison of achievement test results did not reveal any notable difference between groups I and II. Such results may again indicate no difference between groups in academic achievement. It is also possible however, that achievement tests are not sensitive to the academic differences of children making normal academic progress and those with language/learning problems. A similar problem presents itself when comparing the number of children in each group classified as learning disabled, which was essentially equal. The criteria used to classify a child as learning disabled in Montana, as discussed in chapter II, is vague, and the assessment tools used to make this classification are highly varied. Thus conclusions that can be drawn from this comparison are limited.

Parent/Teacher Ratings

Parent/teacher ratings were highly consistent throughout this study. This finding most likely indicates excellent communication between parents and teachers, and reflects positively on the educational system. In the few instances where differences did occur, teachers tended to rate students more stringently than did the children's parents. Such differences may be explained by the possibility that parents have adjusted to and make allowances for their children's difficulty with learning and language and therefore rate their children less stringently, while teachers make no such adjustment. Also, in the case of differences between parents and teachers and their ratings of language, it is possible the children use different language skills in the home than in the classroom.

Conclusions and Suggestions for Future Research

The results of this study are consistent with past research in that some children diagnosed as language disordered as preschoolers had later academic difficulties, while others did not. Comparison of two groups divided according to age of initial language intervention (before age 3.5, and after age 3.5) revealed no significant difference between groups in terms of later academic progress. Results were, however, consistent with Bain's 1978 study. More children

who began language treatment before age 3.5 years of age demonstrated normal academic progress than did those who began treatment after age 3.5 years. Such a finding may indicate language and learning disordered children are the same children, at different levels on the developmental continuum. Early language intervention then, may make a difference in these children's later academic success. The non parametric statistical procedure used in this analysis however,was not sensitive to this difference. The use of more sensitive, parametric statistics may show the differences seen consistently in these two studies to be significant. A number of methodological problems however, precluded the use of parametric statistics and limited the generalizability of these findings. Such limitations suggest the need for further research which addresses the following points. First, a larger number of subjects is necessary. Increasing the number of subjects would increase variability and thus allow for more specific analysis . For example, a finer breakdown of data might allow specific clusters of skills to be identified as critical to academic progress. The fact that the possible subject pool was virtually exhausted in this study in Missoula MT (pop. 65000) may indicate the need for future research to be conducted in a large metropolitan area.

Second, future research needs to be prospective and longitudinal in nature. Such a design would allow for the use of the same assessment tools across subjects and through out the study. In addition, the use of a broad range of

assessment tools and careful analysis of results would allow for a more consistent and appropriate diagnosis of both language disorder and learning disorder. Assessment at the preschool level would ideally include analysis of non verbal cognitive skills as well as all facets of language development. Specific analysis of reading skills at school age, in addition to the use of school records, would also provide more specific information regarding the nature of the subject's academic skills. Prospective research further allows careful control of age and type of language intervention. Such controls would provide much clearer information regarding the underlying processes involved in language and learning problems and the best course to take in remediation of these problems.

That a relationship between preschool language disorder and later learning problems exists is clear. Exactly what that relationship is and how it can best be addressed clinically continues to remain unclear. Future research must go beyond the limitations of current research to address these questions. Only with the answers to these questions can the needs of the language/learning disordered truly be met.

APPENDIX A
Descriptive Information

Name: _____

Sex:
__ male
__ female

Socioeconomic Status
__ poverty
__ low
__ middle
__ high

Speech/Language Disorder Type (according to clinic record)	Mild (6-12 mts)	Moderate (1-2 yrs)	Severe (> 2yrs)
expressive			
__semantic			
__syntactic			
__pragmatic			
__phonologic			
receptive			
__semantic			
__syntactic			
__pragmatic			
__phonologic			
expressive and receptive			
__semantic			
__syntactic			
__pragmatic			
__phonologic			

Speech/Language Therapy

Individual___
Frequency and duration _____

Group___
Frequency and duration _____
Description_____

Appendix B

UNIVERSITY OF MONTANA SPEECH, LANGUAGE AND HEARING CLINIC
Speech and Language Follow-up Study

Date

Dear Mr./Ms. :

Here at the University of Montana Speech, Language and Hearing Clinic, we are conducting a follow-up study of children seen in the past for certain kinds of speech and language problems. In gaining information regarding these children's current skills academically we hope to better understand how we can help preschool children prepare for the challenges of grade school. We hope to obtain information regarding these children's current school progress through breif interviews with both parents and current teachers, and through review of school records.

A review of our files indicates that your child received language therapy at this clinic as a preschooler. We would like to obtain your permission to include your child in this study, and enlist your cooperation in gaining the information we need. Please fill out the accompanying permission slip and return to the University of Montana. We will be contacting you soon by telephone for a breif interview regarding your child's academic progress. We appreciate your help.

Sally Ann R Chisholm
Speech/Language Pathology
Student

Barbara Bain, Ph.D.
Speech/Language Pathologist

Appendix B continued

UNIVERSITY OF MONTANA SPEECH, LANGUAGE AND HEARING CLINIC
Speech and Language Follow-up Study
Permission Form

The University of Montana Speech, Language and Hearing Clinic has my permission to include my child _____ in the Speech and Language Follow-up study being done by Sally Ann R. Chisholm and Barbara Bain, PhD. I understand that this study will involve obtaining information regarding my child's academic progress from teachers, school records, and myself. Futhermore, I understand that this informaation will be held confidential and used for no other purpose than this study.

Signed

Date:

Appendix C

UNIVERSITY OF MONTANA SPEECH, LANGUAGE AND HEARING CLINIC

Lanugage Follow-up Study

Structured Parent Interview

Child's Name — Date
Birthdate — Current Age
Parent's Name — Address
Phone

Permission Letter Sent
Permission Letter Recieved

Academic Information

1 Current School:_____
address_____
grade_____
primary teacher_____
special placement_____

2. History of classroom placement: please indicate whether your child has been involved in any of the following

		yes	no	
a.	Repeated Grades	[ ]	[ ]	which ones _____
b.	Special Classroom Placement	[ ]	[ ]	classname _____ when _____ how long _____
c.	Regular Classroom Placement	[ ]	[ ]	
d.	Remedial Work/ Special Help reading	[ ]	[ ]	when _____ how long_____
e.	Remedial Work/ Special Help Math	[ ]	[ ]	when _____ how long _____
f.	Remedial Work/ Special Help other subjects	[ ]	[ ]	subject_____ when _____ how long _____
g.	Speech/Language Therapy	[ ]	[ ]	when _____ where _____ how long _____ goals _____

Specific Subject Information

	Excellent performance	Acceptable performance	unknown	Area of difficulty	Severe problem
Reading					
1. Overall reading skills	[ ]	[ ]	[ ]	[ ]	[ ]
2. Understanding oral reading	[ ]	[ ]	[ ]	[ ]	[ ]
3. Understanding printed material	[ ]	[ ]	[ ]	[ ]	[ ]
Writing					
Overall writing	[ ]	[ ]	[ ]	[ ]	[ ]
spelling	[ ]	[ ]	[ ]	[ ]	[ ]
writing coordination	[ ]	[ ]	[ ]	[ ]	[ ]
slowness					
Arithmatic					
Overall Arithmatic	[ ]	[ ]	[ ]	[ ]	[ ]
Story problems	[ ]	[ ]	[ ]	[ ]	[ ]
Other Subjects					
Science	[ ]	[ ]	[ ]	[ ]	[ ]
Social Studies	[ ]	[ ]	[ ]	[ ]	[ ]
English/grammer	[ ]	[ ]	[ ]	[ ]	[ ]
Literature	[ ]	[ ]	[ ]	[ ]	[ ]
Art	[ ]	[ ]	[ ]	[ ]	[ ]
Music	[ ]	[ ]	[ ]	[ ]	[ ]
Physical Education	[ ]	[ ]	[ ]	[ ]	[ ]

	Always	usually	unknown	sometimes	never
Speech/Language					
Verbalized easily	[ ]	[ ]	[ ]	[ ]	[ ]
Answers questions appropriately	[ ]	[ ]	[ ]	[ ]	[ ]
Tells a story or describes an event	[ ]	[ ]	[ ]	[ ]	[ ]
Uses adequate vocabulary	[ ]	[ ]	[ ]	[ ]	[ ]
Uses complete sentences	[ ]	[ ]	[ ]	[ ]	[ ]
Uses correct grammer	[ ]	[ ]	[ ]	[ ]	[ ]
Understands what is said	[ ]	[ ]	[ ]	[ ]	[ ]
Follows directions	[ ]	[ ]	[ ]	[ ]	[ ]
Uses correct pronounciation	[ ]	[ ]	[ ]	[ ]	[ ]
Stutters	[ ]	[ ]	[ ]	[ ]	[ ]
Overall Speech Language	[ ]	[ ]	[ ]	[ ]	[ ]

Appendix D

Dear Mr./Ms.

Here at the University of Montana Speech, Language, and Hearing Clinic, we are conducting a follow-up study of children seen in the past for certain kinds of speech and language problems. In gaining information regarding these children's current skills academically, we hope to better understand how we can help pre-school children prepare for the challenges of grade school. We hope to obtain information regarding these children's current school progress through a parent and teacher questionnaire, and a review of each child's school record. We would like to ask your help in gaining the information we need.

Enclosed is a breif (5- 10 minute) questionnaire. Please fill it out as completely as you can regarding your current student _____. We have received written parent permission and support for the release of this type of information to us. We thank you for your help.

Sincerely,

Sally Ann R. Chisholm
Speech/Language Pathology
Student

Appendix D

UNIVERSITY OF MONTANA SPEECH,LANGUAGE, AND HEARING CLINIC

Language Follow-up Study

Teacher Questionnaire

Child's Name_____

Teachers Name_____

Date_____

Academic Information

1. This child currently involved in which of the following:

	yes	no	
a. regular classroom	/ /	/ /	
b. regualar classroom but retained a grade	/ /	/ /	
c. remedial work/ special help reading	/ /	/ /	how often_____
d. remedial work/ special help math	/ /	/ /	how often_____
e. remedial work/ special help other subjects	/ /	/ /	subject(s)_____ how often_____
f. special classroom	/ /	/ /	classroom name_____
g. speech/language therapy	/ /	/ /	how often_____ goals_____
h. other	/ /	/ /	describe_____

Specific Subject Information

	Excellent performance	Adequate performance	unknown	Area of difficulty	severe problem
Reading					
Overall reading skills	/ /	/ /	/ /	/ /	/ /
Visual perceptual skills	/ /	/ /	/ /	/ /	/ /
Auditory perceptual skills	/ /	/ /	/ /	/ /	/ /
Writing					
Overall writing	/ /	/ /	/ /	/ /	/ /
Spelling	/ /	/ /	/ /	/ /	/ /
Writing coordination	/ /	/ /	/ /	/ /	/ /
slowness	/ /	/ /	/ /	/ /	/ /

Arithmatic										
Overall arithmatic	/	/	/	/	/	/	/	/	/	/
Story problems	/	/	/	/	/	/	/	/	/	/
Other Subjects										
Science	/	/	/	/	/	/	/	/	/	/
Social Studies	/	/	/	/	/	/	/	/	/	/
English/grammer	/	/	/	/	/	/	/	/	/	/
Literature	/	/	/	/	/	/	/	/	/	/
Art	/	/	/	/	/	/	/	/	/	/
Music	/	/	/	/	/	/	/	/	/	/
Physical education	/	/	/	/	/	/	/	/	/	/
Speech/language										
Overll speech/language	/	/	/	/	/	/	/	/	/	/
	Always		usually		sometimes		seldom		never	
Verbalizes easily	/	/	/	/	/	/	/	/	/	/
Answers questions appropriately	/	/	/	/	/	/	/	/	/	/
Tells a story or describes an event correctly	/	/	/	/	/	/	/	/	/	/
Uses adequate vocabulary	/	/	/	/	/	/	/	/	/	/
Uses complete sentences	/	/	/	/	/	/	/	/	/	/
Uses correct grammer	/	/	/	/	/	/	/	/	/	/
Understands what is said	/	/	/	/	/	/	/	/	/	/
Follows directions	/	/	/	/	/	/	/	/	/	/
Uses correct pronounciation	/	/	/	/	/	/	/	/	/	/
Stutters	/	/	/	/	/	/	/	/	/	/

How would you rate this child's overall school performance?

excellent		acceptable		unknown		poor		very poor	
/	/	/	/	/	/	/	/	/	/

Appendix E

Cumulative Record Data

Grade	Advanced	Retained
1.		
2.		
3.		
4.		
5.		
6.		

Special Services yes__ no__
What when_____

Acheivement Test Results

Test_____	Percentile	Grade Equivalent
reading	_____	_____
math	_____	_____

APPENDIX F

THERAPY DATA

GROUP #1: Treatment Pre 3.5 Years

KEY:

Type: E - Expressive
R - Receptive
E/R - Expressive/ Receptive

Severity: M - Mild
MD - Moderate
S - Severe

Therapy Duration: 6 (months)
612 - 6-12 mos.
12 (months)

Therapy Type: G - Group
I - Individual
IG - Individual & Group

Subject	Disorder Type	Severity	Rx Duration	Rx Type	Description of Therapy Approach
#1	E	M	6	G	Modeling
#2	I	M	6	G	Reactive
#3	E/R	MD	612	I	Behavior Modification, Modeling
#4	E/R	MD	12	IG	Behavior Modification, Modeling
#5	E	MD	6	G	Reactive
#6	E	MD	12	IG	Articulation, Reactive
#7	E/R	MD/S	6	IG	Reactive, Parent Training
#8	E	M	6	I	Reactive, Parent Training
#9	E/R	MD	612	IG	Reactive, Modeling, Behavior Modification
#10	E	MD	12	IG	Modeling, Interactive

APPENDIX F (cont.)

THERAPY DATA

GROUP #1: Treatment Post 3.5 Years

KEY:

Type: E - Expressive
R - Receptive
E/R - Expressive/ Receptive

Severity: M - Mild
MD - Moderate
S - Severe

Therapy Duration: 6 (months)
612 - 6-12 mos.
12 (months)

Therapy Type: G - Group
I - Individual
IG - Individual & Group

Subject	Disorder Type	Severity	Rx Duration	Rx Type	Description of Therapy Approach
#1	E	M	612	IG	Reactive, Behavior Modification
#2	E	MD	12	I	Reactive, Behavior Modification
#3	E	MD	12	IG	Reactive, Interactive, Behavior Modification (Articulation)
#4	E/R	M/S	6	I	Modeling, Parent Training
#5	E/R	MD	612	I	Behavior Modification
#6	E	M/MD	612	IG	Reactive, Behavior Modification (Articulation)
#7	E	M	6	I	Behavior Modification
#8	E	MD/S	612	I	Behavior Modification, Interactive
#9	E/R	MD	6	I	Diagnostic
#10	E/R	MD	12	IG	Reactive, Behavior Modification

APPENDIX G

SPEECH/LANGUAGE DATA FROM TEACHER QUESTIONNAIRE

GROUP #1: Treatment Pre 3.5 Years

Subject	Overall Speech/ Language	Verbalization Skills	Ability to Answer Questions	Ability to Tell Story/ Describe Event	Adequate Vocabulary	Complete Sentence Use	Grammar	Comprehension	Follows Directions	Articulation	Fluency
#1	-	+	+	+	+	+	-	+	+	+	+
#2	+	-	+	+	+	+	+	+	+	+	+
#3	+	+	+	+	+	+	+	+	+	+	+
#4	-	-	+	-	-	-	-	+	+	-	-
#5	-	-	-	-	-	-	-	+	+	-	UN
#6	+	+	+	+	+	+	+	+	+	+	+
#7	+	+	+	+	+	+	+	+	+	+	+
#8	-	-	+	+	+	-	+	+	+	=	+
#9	+	+	+	+	+	+	+	+	+	+	+
#10	-	_	-	-	-	+	-	-	-	UN	+
TOTAL +:	5	6	8	7	7	7	6	9	9	6	9
TOTAL -:	5	4	2	3	3	3	4	1	1	3	1

+ = Normal Speech Process
- = Abnormal Speech Process
UN = Unknown/Not Applicable

APPENDIX G (cont.)

SPEECH/LANGUAGE DATA FROM PARENT INTERVIEW
GROUP #1: Treatment Pre 3.5 Years

+ Normal Speech/Language
- Abnormal Speech/Language
UN Unknown/Not Applicable

Subject	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	TOTAL +	TOTAL -
Overall Speech/ Language	+	+	+	+	+	+	+	+	+	+	10	0
Verbalization Skills	+	+	+	+	+	+	+	-	+	+	9	1
Ability to Answer Questions	+	+	+	+	+	+	-	+	+	+	9	1
Vocabulary	+	+	+	-	+	+	+	-	+	+	8	2
Complete Sentence Use	+	+	+	+	+	+	+	-	+	+	9	1
Grammar	+	+	+	+	+	+	+	+	+	+	10	0
Comprehension	+	+	+	+	+	+	+	+	+	+	10	0
Follow Directions	+	+	+	+	+	+	-	+	+	+	9	1
Articulation	+	-	-	-	-	+	+	+	+	-	5	5
Fluency	+	+	+	+	+	+	+	+	+	+	10	0
Ability to Tell Story	+	+	+	+	+	+	+	-	+	+	9	1

APPENDIX G (cont.)

SPEECH/LANGUAGE DATA FROM TEACHER QUESTIONNAIRE

GROUP #II: Treatment Post 3.5 Years

Subject	Overall Speech/ Language	Verbalization Skills	Ability to Answer Questions	Ability to Tell Story Describe Event	Adequate Vocabulary	Complete Sentence Use	Grammar	Comprehension	Follows Directions	Articulation	Fluency
#1	+	+	+	+	+	+	+	+	+	+	+
#2	+	+	-	-	+	+	-	-	+	-	+
#3	+	+	+	+	+	+	+	+	+	+	+
#4	+	+	+	+	+	+	+	+	+	+	+
#5	-	-	-	-	-	+	-	-	-	-	+
#6	+	+	+	+	+	+	+	+	+	-	+
#7	-	+	-	-	-	-	-	+	+	-	+
#8	-	-	-	+	-	-	-	+	+	-	+
#9	-	-	+	+	+	+	+	+	+	+	+
#10	-	-	+	+	+	+	+	+	+	+	-
TOTAL +:	5	6	6	7	7	8	6	8	9	5	9
TOTAL -:	5	4	4	3	3	2	4	2	1	5	1

APPENDIX G (cont.)

SPEECH/LANGUAGE DATA FROM PARENT INTERVIEW
GROUP #II: Treatment Post 3.5 Years

+ Normal Speech/Language
- Abnormal Speech/Language
UN Unknown/Not Applicable

Subject	Overall Speech/ Language	Verbalization Skills	Ability to Answer Questions	Vocabulary	Complete Sentence Use	Grammar	Comprehension	Follow Directions	Articulation	Fluency	Ability To Tell Story
#1	+	+	+	+	+	+	+	+	+	+	+
#2	+	+	+	-	+	+	-	-	+	-	+
#3	-	+	+	+	+	+	+	+	+	-	+
#4	+	+	+	+	+	+	+	+	-	+	+
#5	+	+	+	-	-	+	+	+	+	-	+
#6	+	+	+	+	+	+	+	+	+	+	+
#7	-	+	+	-	+	+	+	+	+	-	+
#8	+	+	+	+	-	+	+	+	+	+	+
#9	+	+	+	+	+	+	+	+	+	+	+
#10	-	+	-	-	+	-	+	+	-	+	-
TOTAL +	7	10	9	6	8	9	9	9	8	6	9
TOTAL -	3	0	1	4	2	1	1	1	2	4	1

APPENDIX G (cont.)

ACADEMIC DATA FROM TEACHER QUESTIONNAIRE
GROUP #1: Pre 3.5 Years

+ Normal Academic Progress
- Abnormal Academic Progress
UN Not Applicable/Unknown

Subject	Overall Academic	Overall Reading	Visual Perception	Auditory Perception	Overall Writing	Writing Coordination/ Speed	Overall Arithmetic	Math Story Problems	Science	Social Studies	English/Literature	Art	Music	Physical Education	Spelling
#1	+	+	+	+	UN	-	+	+	+	+	UN	+	+	+	UN
#2	+	+	+	+	+	UN	+	+	+	+	UN	+	+	+	+
#3	-	+	+	+	+	+	+	UN	+	+	+	+	+	+	+
#4	-	-	+	-	+	+	+	UN	-	-	+	+	+	-	-
#5	-	-	-	-	-	+	-	-	-	-	+	+	+	+	-
#6	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
#7	+	+	+	+	-	-	+	+	+	+	UN	+	+	UN	UN
#8	+	+	+	+	+	+	+	+	+	+	+	+	+	+	UN
#9	-	+	+	+	-	-	+	+	+	+	+	+	+	+	+
#10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL +	5	7	8	7	5	5	8	6	7	7	6	9	9	7	4
TOTAL -	5	3	2	3	4	4	2	2	3	3	1	1	1	2	3

APPENDIX G (cont.)

ACADEMIC DATA FROM PARENT INTERVIEWS
GROUP #1: Treatment Pre 3.5 Years

+ Normal Academic Progress
- Abnormal Academic Progress
UN Not Applicable/Unknown

Subject	Overall Academic	Overall Reading	Visual Perception	Auditory Perception	Overall Writing	Writing Coorination/Speed	Overall Arithmetic	Math Story Problems	Science	Social Studies	English/Literature	Art	Music	Physical Education	Spelling
#1	+	+	UN	UN	+	+	+	UN	+	+	+	UN	UN	UN	UN
#2	+	+	UN	UN	+	+	+	+	+	+	+	+	+	+	+
#3	-	+	UN	UN	+	UN	-	UN	+	+	+	+	+	+	+
#4	-	-	UN	UN	+	+	-	UN	+	+	+	-	UN	+	UN
#5	-	-	-	-	+	+	-	-	+	+	+	+	+	+	-
#6	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
#7	+	+	UN	UN	-	-	+	UN	+	+	+	UN	UN	UN	UN
#8	+	+	UN	UN	+	+	+	UN	+	+	+	UN	UN	UN	UN
#9	-	-	+	-	-	-	+	+	+	+	+	-	+	+	+
#10	-	+	UN	UN	+	-	+	-	+	+	+	+	-	-	-
TOTAL +	5	7	1	1	8	6	7	3	10	10	10	5	5	6	4
TOTAL -	5	3	1	2	2	3	3	2	0	0	0	2	1	1	2

APPENDIX G (cont.)

ACADEMIC DATA FROM TEACHER QUESTIONNAIRE
GROUP #II: Post 3.5 Years

+ Normal Academic Progress
- Abnormal Academic Progress
UN Not Applicable/Unknown

Subject	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	TOTAL +	TOTAL -
Overall Academic	-	-	+	+	-	-	-	-	-	-	2	8
Overall Reading	+	-	+	+	-	+	-	-	+	-	5	5
Visual Perception	+	UN	+	+	+	+	UN	+	-	-	5	2
Auditory Perception	+	-	+	+	-	+	UN	+	UN	-	5	3
Overall Writing	+	-	+	+	-	+	-	-	+	+	6	4
Writing Coordination/Speed	+	-	+	-	-	+	-	-	-	-	3	7
Overall Arithmetic	+	-	+	+	-	+	-	+	+	+	7	3
Math Story Problems	+	-	+	+	-	-	-	+	UN	-	4	5
Science	+	-	+	+	-	+	+	+	UN	+	7	2
Social Studies	+	-	+	+	-	+	+	+	UN	+	7	2
English/Literature	UN	-	+	+	-	+	-	-	UN	UN	3	4
Art	+	UN	+	+	+	+	+	+	-	+	8	1
Music	UN	+	+	UN	+	+	+	+	+	+	8	0
Physical Education	+	UN	+	+	+	+	UN	+	+	+	8	0
Spelling	+	-	+	+	-	+	-	-	+	+	6	4

APPENDIX G (cont.)

ACADEMIC DATA FROM PARENT INTERVIEWS
GROUP #II: Treatment Post 3.5 Years

+ Normal Academic Progress
- Abnormal Academic Progress
UN Not Applicable/Unknown

Subject	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	TOTAL +	TOTAL -
Overall Academic	-	-	+	+	-	-	-	-	-	-	2	8
Overall Reading	+	-	+	+	-	+	-	-	+	-	5	5
Visual Perception	+	UN	UN	UN	-	UN	UN	+	UN	+	3	1
Auditory Perception	+	UN	UN	UN	-	UN	UN	-	UN	-	1	3
Overall Writing	+	-	+	+	-	-	-	+	-	+	5	5
Writing Coordination/Speed	+	-	+	+	-	-	-	+	+	+	3	7
Overall Arithmetic	+	-	+	-	+	+	-	+	+	-	6	4
Math Story Problems	UN	-	UN	UN	UN	+	UN	-	UN	-	1	3
Science	+	-	+	+	+	+	+	+	UN	-	7	2
Social Studies	+	-	+	+	+	+	+	+	UN	-	7	2
English/Literature	UN	-	-	+	-	+	-	-	UN	-	2	6
Art	+	UN	-	+	+	+	-	+	+	+	7	2
Music	+	UN	+	+	UN	+	+	+	+	+	8	0
Physical Education	+	UN	-	+	+	+	+	+	+	+	8	1
Spelling	+	-	-	+	-	+	-	-	+	-	4	6

APPENDIX G (cont.)

RATINGS OF 1984 SRA OR IOWA BASIC ACHIEVEMENT TESTS

GROUP #I
Treatment Pre 3.5 Years

Subject	Test	Rating Reading	Math
#1	SRA	+	+
#2	SRA	+	+
#3	IB	+	-
#4	SRA	+	+
#5	SRA	+	+
#6	SRA	+	+
#7	SRA	+	+
#8	SRA	+	+
#9	SRA	+	+
#10	SRA	+	-
TOTAL +		10	8
TOTAL -		0	2

GROUP #II
Treatment Post 3.5 Years

Subject	Test	Rating Reading	Math
#1	SRA	+	+
#2	SRA	-	-
#3	SRA	+	+
#4	SRA	+	+
#5	SRA	UN	UN
#6	IB	+	+
#7	SRA	UN	UN
#8	IB	UN	UN
#9	SRA	UN	UN
#10	-	UN	UN
TOTAL +		4	4
TOTAL -		1	1

+ Within 1 Standard Deviation
- Outside 1 Standard Deviation
UN No Score Available
IB Iowa Basic Score
SRA SRA Achievement Test

Procedural Reliability

Parent\Teacher Data

Appendix H
pages

Child #: 9
Reporter: parent
Group #: 1
Researcher: Sally Lou R Christiansen
Independent Rater: Ing Heyster
Percent Agreement: 92 %

Question #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Researcher	−	−	−	−	−	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	/
Independent Rater	+	+	−	−	−	+	+	+	+	+	+	+	+	+	+	+	+	−	+	+	+	−	+	+

Procedural Reliability

Parent\Teacher Data

Child #: 3
Reporter: teacher
Group #: 1
Researcher: Sally Ann R Chisholm
Independent Rater: Tina Sleyster
Percent Agreement: 100%

Question #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Researcher	—	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Independent Rater	—	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

Procedural Reliability

Parent\Teacher Data

Child #: 2
Reporter: parent
Group #: b 1
Researcher: Sally Ann R Chisholm
Independent Rater: Tina Steyster
Percent Agreement: 100%

Question #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Researcher	+	+	+	+	+	+	+	+	+	+	+	+	−	+	+	+	+	+	+	+	+	+	+	
Independent Rater	+	+	+	+	+	+	+	+	+	+	+	+	−	+	+	+	+	+	+	+	+	+	−	

Procedural Reliability

Parent\Teacher Data

Child #: 7
Reporter: teacher
Group #: 2
Researcher: Sally Ann R Chisholm
Independent Rater: Tina Sleyster
Percent Agreement: 100%

Question #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Researcher	-	-	-	-	-	-	-	+	+	-	-	/	/	UN	-	/						/	/	-
Independent Rater	-	-	-	-	-	-	-	+	+	-	-	+	+	UN	-	+	-	-	-	-	-	+	+	-

Procedural Reliability

Parent\Teacher Data

Child #: 3
Reporter: parent
Group #: 2
Researcher: Sally Ann P Chisholm
Independent Rater: Ann Sleyster
Percent Agreement: 83.3%

Question #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Researcher	+	+	+	−	+	+	UN	+	+	−	−	−	+	−	−	+	− UN	+	+	−	+	+	−	
Independent Rater	+	+	+	−	+	+	UN	+	+	−	−	+	−	−	+	+	UN	+	+	−	+	+	−	

Procedural Reliability

Parent\Teacher Data

Child #: (1)
Reporter: teacher
Group #: 2
Researcher: Sally Ann R Chisholm
Independent Rater: Tina Sleyster
Percent Agreement: 91%

Question #	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Researcher	-	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Independent Rater	-	+	+	+	+	+	+	+	+	UW	+	+	+	+	+	+	+	+	+	+	+	+	+	+

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