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ABSTRACT

The study was designed to explore descriptively the differences in oral language production of three learning disabled children (8 to 9 years old) compared to normal children through observable spontaneous conversational interaction. Spontaneous language samples were videotaped and audiotaped in conversation with the experimenter, a peer, and the S's mother. Samples were evaluated in terms of linguistic maturity, syntax, semantics, and pragmatics. Contrary to the results of previous studies which have been generalized to the entire population of learning disabled children, findings suggested that auditory and visual processing deficits may contribute differentially to the oral language competence of learning disabled children. The value of single subject research methodology is emphasized. (Author/CL)

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The Communicative Competence of Learning Disabled (LD) Children: A Single-Subject Approach

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Abstract

Previous research regarding the oral language competence of learning disabled children has been found to define inadequately the subjects of such study. In addition, both standardized tests and imitative tasks have been the focus of the methodology employed in the majority of such research. The study which will be reported was designed to explore descriptively the differences in the oral language production of learning disabled children in comparison to normal children through observable spontaneous conversational interaction. Contrary to the results of previous studies which have been generalized to the entire population of learning disabled children, this investigation suggests that auditory and visual processing deficits may contribute differentially to the oral language competence of learning disabled children. Emphasized throughout will be the positive value of such a methodology as that of single-subject research in an effort to better identify and differentiate subgroups within the learning disabled population.

The Communicative Competence of Learning Disabled (LD) Children: A Single-Subject Approach

It is a widely held notion that children with learning disabilities may exhibit language and communication deficits (e.g., Cruickshank, Bentzen, Ratzeburg, & Tannhauser, 1961; Myklebust, 1954; Wiig & Semel, 1976, 1980). Early literature in both psychology and linguistics (e.g., M. E. Smith, 1933, reprinted in Bloom, 1978), as well as literature which was to form the basis of the field of learning disabilities (cf. Wiederholt, 1974), further supports this suggestion. Agreement has also been reached as to the significant role which language plays in academic achievement (e.g., Cruickshank et al., 1961; Lindfors, 1980; Myklebust, 1954). Studies concerning the language deficits of the learning disabled population (e.g., Rosenthal, 1970; Wiig & Semel, 1973; Wiig, Semel, & Crouse, 1973; Vogel, 1974; Wiig & Semel, 1974; Parker, Freston, & Drew, 1975; Semel & Wiig, 1975; Wiig & Roach, 1975; Wiig & Semel, 1975; Wiig, Lapointe, & Semel, 1977) were inspired, in part, by this realization regarding the link between language development and academic proficiency. In addition, recent research reported by Bloom (1979), Blank, Gessner, and Esposito (1979), Donahue, Pearl, and Bryan (1980), Bryan, Donahue, and Pearl (1981a), and Donahue (1981) continues to lend credence to the notion that children diagnosed as learning disabled may display difficulties with the development of language and communication skills.

Studies concerning the communicative competence of the learning disabled have suggested that the language deficits exhibited by this population

> may be assigned to one or more of four broad categories. They may reflect either (1) reductions in short-term memory, (2) delays in the acquisition of linguistic rules and in linguistic processing of spoken language, (3) reductions in the cognitive-semantic and logical processing of spoken language, and/or (4) dysnomia, characterized by reduced accuracy and speed of retrieval of words and verbal associations. (Wiig, 1976, p. 5).

Additionally, research (e.g., Wiig & Roach, 1975; Wiig & Semel, 1974, 1975; Wiig, Lapointe, & Semel, 1977) has indicated that the language deficits experienced by learning disabled children may indeed continue into adolescence. Finally, investigations conducted by Donahue et al. (1980), Bryan et al. (1981a), and Donahue (1981) suggest pragmatic deficits exhibited by the learning disabled within the context of task-specific communication.

While the above studies have resulted in important findings, these studies, with few exceptions (Donahue et al., 1980; Bryan et al., 1981a; Donahue, 1981), have mirrored the studies of normal child language acquisition and the studies of the language disordered child that were consistent with the generative grammatical emphasis of the 1960s--centering on linguistic competence through the syntactic and semantic analysis of sentences produced spontaneously or imitatively (Gallagher & Darnton, 1978)--and have ignored the child's ability, his/her communicative competence, within particular settings. This focus in the study of the language competence of the learning disabled has been reflected in the methodology employed in such study; for example, Rosenthal (1970) employed Menyuk's testing approach using prescribed questions, imitations, and sentence completion; Vogel, 1974,

Semel and Wiig, 1975, and Wiig, Lapointe, and Semel, 1977, employed Lee's Northwest Syntax Screening Test; Semel and Wiig, 1975, employed the Assessment of Children's Comprehension; and, Wiig, Lapointe, and Semel, 1977, employed the Token Test. Although such standardized assessment instruments and analytical procedures as those employed in the abovementioned investigations allow for the description of content (semantics) and form (syntactics), most aspects of use (pragmatics) are not assessed through such procedures (Bloom & Lahey, 1978). Admittedly, the results of such instruments and procedures provide some valued information regarding the productive linguistic abilities of the learning disabled child; however, such results hardly reflect the nature of the child's ability to produce language in a spontaneous communicative context. Direct observation of the subject in a spontaneous speech sample is necessary for the assessment of functional communication abilities. Direct observation allows assessment of the child's use of language for communicative interaction, and allows observation of the child when using language for natural purposes, rather than for elicitation or imitation. Until recently, the pragmatic analysis of the oral language output of the learning disabled child had not been undertaken (Mercer, 1979).

The investigations of Donahue et al. (1980), Bryan et al. (1981a) (see Bryan, Donahue, and Pearl, 1981b, for a review of these studies), and Donahue (1981) were designed in such a manner as to allow for the examination of the communicative competence of the learning disabled with regard to pragmatics. For example, Bryan et al. (1981a) investigated the interaction of learning disabled children with their peers through the use of a small-group problem-solving task. Third through eighth grade "learning

disabled" (N=54) and nondisabled (N=46) children were paired with two randomly selected classmates who matched the subject in terms of sex and grade. Each child was then given a list of 15 gift items which they were required to independently rank from 1 to 15 in order to indicate the choices which they perceived as best for a gift for their classroom. Following a privately held interview with the experimenter, half of the subjects and all of the randomly selected classmates were given neutral feedback from the experimenter regarding their choices. The remaining half of the subjects were given highly positive feedback regarding their gift choices, and were told additionally that they should help the other members of their triad make such good choices. After the interview with each child and the provision of feedback concerning the child's gift choices, the triad was assembled and given the task of collectively arriving at a gift choice for their classroom. The intention here was to examine the nature of the persuasive and dominance characteristics of the learning disabled children when interacting with peers in a situation deemed to be motivating. Results of this investigation indicated that the learning disabled children were less persuasive than their peers in gaining acceptance of their ideas as to what would be the best gift choice. Furthermore, the learning disabled children were found to be "more likely to agree, less likely to disagree, and less likely to argue their case than the nondisabled. . . . less likely to monitor the group's progress. . . . [and were] less likely. . . to attempt to "hold the floor" (Bryan et al., 1981b, p. 35). In terms of frequency of conversational turns and frequency of topic initiations, the learning disabled children were not found to differ from their nondisabled peers. Finally, the learning

disabled children were found to be more likely than their nondisabled peers to respond to requests for opinions.

The above study is representative of the investigations conducted to date concerning the pragmatic competence of the learning disabled. Of particular importance is the task-specific nature of these studies--e.g., in the above case, the negotiation of a cooperative decision by each triad. Though the results of such studies should not be minimized--e.g., the above study provides insight into the small-group problem-solving skills of the learning disabled in such a situation--the question arises as to whether or not statements regarding the general pragmatic competence of the learning disabled can be made based on such task-specific situations. As Shatz (1978) has indicated,

> A skill is likely to appear sporadically depending on the degree of competence with it and other techniques called for in a given task. A particular skill will be revealed most readily when other cognitive demands are minimized. Conversely, the performance of a skill will be most degraded when the task which requires it makes heavy processing demands. (p. 8).

One might also question, in the same vein, the studies of the syntactic and semantic abilities of the learning disabled. Since these studies have relied on results obtained via standardized assessment instruments and imitative tasks, one might well raise the question as to whether or not the obtained results are representative of the learning disabled child's competence within the context of spontaneous conversational interaction. It might well be suspected that the cognitive demands and/or processing demands of such instrumentation and procedures would be more focused than in the conversa-

tional communication context, thereby indicating the possibility that the demands on the individual are, in the very least, different, if not greater, in conversational interaction.

Such investigations as those which employ standardized assessment instruments and imitation procedures, and those which employ task-specific interactional events as the basis for their results, while providing useful information regarding the linguistic abilities and task-specific pragmatic abilities of the learning disabled, cannot be construed as an adequate reflection of the nature of the child's ability to produce language in a spontaneous communicative context. Hence, it is possible to see the necessity of studying the learning disabled within the context of conversational interaction in order to determine his/her communicative competence in the most naturally occurring event associated with language production.

Aside from this criticism of previous research on the communicative competence of the learning disabled, the abovementioned studies may also be criticized on other grounds. These studies, including those which examined the linguistic abilities of the learning disabled as well as those which examined the pragmatic abilities, have often defined their subject populations no further than stating that they were classified as learning disabled (with control subjects labeled as normal). When there has been further classification, it has been at best minimal. For example, the studies of Donahue et al. (1980), Bryan et al. (1981a), and Donahue (1981) utilized the same subject pools and the same subject selection criteria; thus, it is necessary to examine only one.

Subjects selected from grades 1 through 8 in a Chicago parochial school

system (a school system that does not identify those who are learning disabled) were utilized in the investigation conducted by Donahue, Pearl, and Bryan (1980). The criteria for participation as a "learning disabled" subject was based on: (1) Peabody Picture Vocabulary Test (PPVT) (Dunn, 1965) scores of at least 90, used as a measure of intelligence; (2) teacher ratings, i.e., those "having difficulty in reading, paying attention, acquiring verbal skills, or following directions," (Donahue et al., 1980, p. 391); and, (3) reading achievement test scores obtained from the SRA Achievement Series Test (Naslund, Thorpe, & Lefever, 1978) below the 40th percentile for grade level, or a score below the 40th percentile on the reading subtest of the Woodcock-Johnson Psycho-Educational Battery (Woodcock & Johnson, 1977) where a score on the SRA Achievement Series Test was not available. Subjects were defined as normal if they: (1) obtained average or above average teacher ratings; and, (2) obtained reading achievement scores above the 40th percentile. In addition, normal subjects were randomly selected classmates who matched the learning disabled subjects on sex, school attended, and grade placement. Finally, all subjects were noted to be Caucasian, native speakers of English, and predominately middle-class.

The fallacy in the above criteria for identification and selection of the learning disabled rests with the treatment of such a special population as though it were one which is homogeneous. Certainly, disagreement abounds among professionals as to the exact nature and definition of the learning disabled (Lovitt, 1978). However, it is a rather strongly held tenet that the learning disabled represent a heterogeneous population (Benton, 1978; Pirozzolo, 1979; Satz & Morris, 1980; Russell, 1981; Russell, in press;

Russell & Johns, Note 1). This heterogeneous population consists of such subgroups as those children who exhibit auditory processing disorders, those who exhibit visual processing disorders, those who exhibit perceptual-motor dysfunction, those who exhibit disabilities in reading, those who exhibit difficulties in mathematics, and those who exhibit disorders in oral and/or written language, among others (see Cruickshank & Paul, 1980; Satz & Morris, 1980; Keogh, Major-Kingsley, Omori-Gordon, & Reid, 1982; Tarver, 1982; for reviews of the various classification systems). Therefore, it is of vital importance for researchers conducting investigations of the learning disabled to adequately identify their population of study by specifying such dimensions as those which are cognitive, psychological, social, motoric, and demographic (Keogh, Major, Reid, Gandara, & Omori, 1978; Keogh, Major, Omori, Gandara, & Reid, 1980; Keogh, Major, Omori, & Reid, Note 2; Russell, 1981; Keogh, Major-Kingsley, Omori-Gordon, & Reid, 1982; Russell, in press). In this way, the results of such studies become more meaningful, adding to our understanding of specific children within the population of learning disabled children. Additionally, researchers who specifically define their population of study will allow for the replication of such studies by others. Finally, the results of such investigations are more likely to provide the practitioner with findings which more easily translate into the daily educational planning for specific children.

In response to the above criticisms, the study to be reported here was designed to explore descriptively the differences in the oral language production of learning disabled children in comparison to normal children through observable spontaneous interaction. Furthermore, the study was limited to

learning disabled subjects who were defined as having either auditory processing deficits or visual processing deficits.

The relationship between auditory and visual processing dysfunctions and learning disabilities has long been recognized (e.g., Cruickshank, 1966, 1977; Johnson & Myklebust, 1967; Mann, Goodman, & Wiederholt, 1978). Hallahan (1975, p. 31), in summarizing several studies concerning visual perceptual problems (Leton, 1962; Davol & Hastings, 1967; Coleman, 1968; Lyle, 1968; Whipple & Kodman, 1969; Skubic & Anderson, 1970), states that the "evidence strongly suggests that learning-disabled children, as a group, perform poorly on tasks designed to assess visual perceptual abilities." Hallahan and Kauffman (1978, p. 138), in citing investigations regarding the auditory perceptual abilities of learning disabled children (Golden & Steiner, 1969; Lingren, 1969; Flynn & Byrne, 1970), state that these investigations "indicate that auditory perceptual difficulties are more often found in learning-disabled than in normal children." However strongly the evidence might suggest that learning disabled children have visual and/or auditory processing deficits, caution must be used in ascribing these characteristics to the entire population of learning disabled children. Since these investigations were based on groups of children, one must use caution when considering the significance of the results. As stated by Hallahan and Kauffman (1978, p. 139), "not all children with reading problems [or learning disabilities] have perceptual deficits, and some children who have perceptual deficits can read adequately," (cf. Johnson, 1968). (For a complete discussion of the problems associated with such group designs, see Hallahan, 1977; Guralnick, 1978; Kratochwill, Brody, & Piersel, 1979; Russell, 1981;

Russell, in press; Russell & Johns, Note 1.)

Finally, existing literature supports the notion that auditory perception/processing disorders may have a detrimental effect on the acquisition of language (e.g., Myklebust, 1954; Wepman, 1969; Witkin, 1971; Tallal & Piercy, 1975; Tallal, 1976; Sanders, 1977), and that visual perception/processing disorders may also have a detrimental effect on the acquisition of language (e.g., de Hirsch, 1952; Myklebust, 1954; Geschwind, 1968; Donaldson & Wales, 1970; Wiig & Austin, 1972; Clark, Carpenter, & Just, 1973; Rosch, 1973; Allen, 1974; Myklebust, 1975; Miller & Johnson-Laird, 1976; de Villiers & de Villiers, 1978; Levelt, 1978). (For a review of this literature, see Russell, 1981.)

To review, the following has been found. (1) The oral language output of the learning disabled population of children has not been sufficiently studied, nor has it been studied with respect to communication as interaction and the recent theoretical changes found to be useful in the study of language acquisition. (2) At least in part, the population of learning disabled children do exhibit language and communication deficits. (3) The evidence suggests that both auditory and visual processing/perceptual abilities play a role in the acquisition of language, and in disorders of language. (4) The children who are diagnosed as learning disabled are often found to have perceptual dysfunctions, either auditory or visual, or both, in nature. And finally, (5) the previous research regarding the language and communication deficits of the learning disabled has not adequately defined the subgroups of learning disabled children employed as subjects.

Hence, the present investigation was so designed as to accommodate these

criticisms and knowledge bases by employing a single-subject research design with three subjects--one subject identified as learning disabled and exhibiting auditory processing deficits, one subject identified as learning disabled and exhibiting visual processing deficits, and one subject identified as normal, with the two learning disabled children employed as the experimental subjects and the normal child as the control. This design provided the opportunity to extensively define each subject, and to employ a procedure whereby spontaneous interaction was observed making assessment of both linguistic competence and communicative competence accessible. Furthermore, this design provided the opportunity to observe the differential effect of auditory processing deficits on language competence in comparison to the effects of visual processing deficits.

Method

Subjects

The three subjects of the present study were selected from the school-age population of a public, Toledo metropolitan school district. All subjects were Caucasian, and native speakers of Standard American English (SAE). Furthermore, all subjects resided in an "intact" family, with no other adults residing in the family home.

All subjects were given a visual examination by an ophthalmologist, consisting of a Goldmann Field Test administered to each individual eye, and were found to be within normal limits, and with no abnormalities. Hence, all three subjects were found to be sensorially intact with regard to vision and

problems involving the visual anatomy.

Each of the subjects was given an auditory assessment by an audiologist, consisting of the usual audiometric testing, tympanometric testing, and speech discrimination testing. This testing revealed normal results in the hearing anatomy of both the normal child and the learning disabled child evidencing visual processing deficits. These results indicated that both were sensorially intact with regard to deafness, and had no physical anomolies of the hearing mechanisms. The third subject, the learning disabled child evidencing auditory processing deficits, was found to have a bilateral, high frequency, sensorineural loss, possibly as the result of two bouts with bilateral severe serous otitis media at the age of two to three and four to five. This loss, however, was not suspected as a loss which would inhibit the processing of the normal speech frequencies, and therefore, not likely to have played a influential role in his development of language skills. Furthermore, it has been suggested by recent literature (Zinkus, Gottlieb, & Schapiro, 1978; Bennett, Ruuska, & Sherman, 1980; Zinkus & Gottlieb, 1980) that this type of history of severe serous otitis media may be common to many, if not all, children currently diagnosed as learning disabled with auditory processing deficits.

All subjects were male, approximately nine years of age (Matthew A. - 9;0, Mark V. - 8;8, John N. - 9;3), and came from families of the same approximate socio-economic status (SES), middle-class.[1] Finally, the Wechsler Intelligence Scale for Children-Revised Full Scale Intelligence Quotient (used as a measure of pre-selection of subjects) for each subject was within the average range, particularly when considering the standard

error of measurement for the WISC-R.

The criteria for final selection of the subjects, both normal and learning disabled, rested with results of a number of psycho-educational measures, including the Wechsler Intelligence Scale for Children-Revised (WISC-R), the Illinois Test of Psycholinguistic Abilities-Revised (ITPA), the Motor-Free Test of Visual Perception, the Auditory Discrimination Test (ADT), the Developmental Test of Visual-Motor Integration (VMI), the Wide Range Achievement Test (WRAT), the Jordan Left-Right Reversal Test-Revised (Level 1), and selected portions of the Woodcock-Johnson Psycho-Educational Battery (the Perceptual Speed Cluster composed of the Spatial Relations and Visual Matching subtests, and the Memory Cluster composed of the Memory for Sentences and Numbers Reversed subtests), as well as the ophthalmological and audiological examinations, information from teachers, parents, and the school, and medical records of each subject. Data obtained from these measures were used to define the learning disabled and normal subjects, as well as to determine auditory or visual processing deficits.

The results of the psycho-educational measures are summarized in Table 1. As can be seen from an examination of Table 1, certain of the psycho-educational measures provided for a discrimination among the subjects. Results of the WISC-R indicated the expected variance between subjects in that the normal child (John N.), and both learning disabled children (Matthew A. and Mark V.) scored within normal limits for the Full Scale Intelligence Quotient (FSIQ); and that Matthew A. (the learning disabled child with auditory processing deficits) scored lower on the Verbal Intelligence Quotient and higher on the Performance Quotient, whereas Mark V. (the learning disabled child

TABLE 1

A SUMMARIZATION OF THE RESULTS OF THE

PSYCHO-EDUCATIONAL MEASURES USED IN THE SELECTION OF SUBJECTS

	Matthew A. CA 9;0 GP 2.9	Mark V. CA 8;8 GP 2.9	John N. CA 9;3 GP 3.9
WISC-R			
Verbal Intelligence Quotient	79	107	105
Performance Intelligence Quotient	102	96	112
Full Scale Intelligence Quotient	89	102	109
ITPA-R			
Negative Discrepancies	Auditory Association Verbal Expression Grammatic Closure	Verbal Expression Visual Sequential Memory	Verbal Expression Auditory Sequential Memory Auditory Closure Visual Sequential Memory
Positive Discrepancies	Visual Reception	Auditory Reception Auditory Association Sound Blending Visual Reception Visual Closure	Grammatic Closure Visual Reception Visual Closure
Motor-Free Test of Visual Perception			
Perceptual Age	(7;11)8;8(>9;0)	(6;2)6;11(7;11)	>9;0
Perceptual Quotient	100	86	113

TABLE 1, Continued

	Matthew A.	Mark V.	John N.
Auditory Discrimination Test			
Rating Scale Score	-2	0	0
VMI			
Developmental Age Equivalent	6;5	6;0	10;11
WRAT			
Grade Rating-Reading	1.7	1.3	4.4
Spelling	1.8	1.1	4.3
Arithmatic	2.2	1.9	4.1
Jordan Left-Right Reversal Test			
Percentile Conversion Score	34	97	34
Within Normal Limits	YES	NO	YES
Woodcock-Johnson Psycho-Educational Battery			
Perceptual Speed Cluster			
Percentile Rank at Age	33	28	37
Percentile Rank Range	20-47	18-41	24-53

TABLE 1, Continued

	Matthew A.	Mark V.	John N.
Memory Cluster			
Percentile Rank at Age	9	16	78
Percentile Rank Range	5-16	8-25	58-90

CA = Chronological Age

GP = Grade Placement

with visual processing deficits) scored lower on the Performance Intelligence Quotient and higher on the Verbal Quotient.

The Illinois Test of Psycholinguistic Abilities-Revised (ITPA-R) did not easily discriminate among the subjects. As can be seen in Table 1, Matthew A. did evidence negatively discrepant scores on some of the subtests which are purported to measure auditory processing; likewise, Mark V. also evidenced negatively discrepant scores on some of the subtests which are purported to measure visual processing. In addition, Matthew A. did evidence a positively discrepant score on the subtest for Visual Reception, as did Mark V. on the subtests for Auditory Reception, Auditory Association, and Sound Blending. However, Mark V. also evidenced positively discrepant scores in two areas of his suspected deficit, those of Visual Reception and Visual Closure; and John N., who was expected to evidence normal scores throughout the ITPA-R, evidenced both auditory and visual negative discrepant scores, and positive discrepant scores in Visual Reception, Visual Closure, and Grammatic Closure.

The results of the Motor-Free Test of Visual Perception, as seen in Table 1, were as expected. Both Matthew A. and John N. scored within the normal limits for their ages. Mark V., the learning disabled child with visual processing deficits, did score below his expected level for his age. In addition, scores for the subjects on the Developmental Test of Visual-Motor Integration (VMI), also used to discriminate between learners who have visual processing deficits and those who do not, were as expected, though the degree of difference between Matthew A. and Mark V. was not as great as desired. The Jordan Left-Right Reversal Test (Phase 1) did reveal the expected

results, in terms of visual processing deficits. Mark V. was shown to be the only subject not within normal limits on this test of visual processing abilities.

The Auditory Discrimination Test revealed the expected results, in terms the subjects' auditory processing abilities. Both Mark V. and John N. obtained results within the normal range, while Matthew A. fell below the normal range giving evidence of an auditory processing deficit.

On the selected portions of the Woodcock-Johnson Psycho-Educational Battery, it was expected that the learning disabled child having auditory processing deficits (Matthew A.) would exhibit scores on the Memory Cluster lower than either of the other two subjects, and that the learning disabled child having visual processing deficits (Mark V.) would score lower on the Perceptual Speed Cluster than either of the other two subjects, while the normal child (John N.) would exhibit scores near normal or above normal on both clusters. As indicated in Table 1, these results were obtained. However, it should be noted that the discrimination between the three subjects, as measured by the Woodcock-Johnson, was not significant, particularly with respect to the difference obtained between Matthew A. and Mark V.

While the above psycho-educational measures did not wholly discriminate among the three subjects, there was enough evidence to suggest the suspected processing disorders in the two learning disabled children, and the normal processing abilities in the normal child. Further evidence to substantiate the suspected processing disorders, or lack of processing disorders, was obtained through school records, medical records, and family interviews. The most significant findings from these data, pertaining to each subject,

will be presented.

Matthew A.'s Mother, in interview, reported that Matthew did not say words until the age of three, never crawled, and did not dress himself until the age of six. She felt that Matthew developed normally until the age that oral language normally develops. Medical reports, as noted above, indicated that Matthew had had severe serous otitis media on two occasions. It was also reported that Matthew has some "behavior disorder," diagnosed as Hyperkinetic Reaction of Childhood with Secondary Emotional Reaction, and, therefore, uses the medication Ritalin. Matthew was reported to have mild motor problems, severe auditory association deficits, and short term memory deficits, and an inability to transfer from acoustic symbol systems to graphic symbol systems. School records indicated Matthew's placement in a class for the learning disabled. The reasons for this placement included his difficulty with auditory discrimination, auditory memory, and poor recall of details. Further, the school records indicated that Matthew has been receiving speech therapy for articulation problems, auditory and language skills.

Mark V.'s Mother, in interview, indicated that Mark has no concept or sense of time. Medical records indicated a syncopal attack ("blue spell") in 1975, but nothing that could be incriminating regarding psychoneurological development. School records indicated Mark's academic difficulties, and his placement in a class for the learning disabled. The reasons for this placement included his difficulty in academic areas, his not being able to recognize sight words, his difficulty understanding addition and subtraction, his creating some classroom disturbance by talking inappropriate-

ly to others, his reversing of letters and numbers, and his apparent difficulty with visual motor perception as evidenced in his handwriting. School psychological reports confirmed much of this, and further noted his poor organizational skills, and his apparent strength in auditory areas and weakness in visual areas.

Finally, data accumulated concerning John N. from his Mother, medical records, including pediatric records, and his school records, did not reveal anything unusual. His medical and school histories were normal. There was no indication that he might have any academic probelms. It might best be said that he characterizes the normal, average child.

In summary, all sources of data taken together suggested that Matthew A. is a learning disabled child with auditory processing deficits, that Mark V. is a learning disabled child with visual processing deficits, and that John N. is a normal child with respect to processing abilities. In addition, subjects were matched on the variables of race, use of Standard American English (SAE), the "intact"-ness of family, the presence or absence of ophthalmological and audiological anomolies, age, sex, socio-economic status (SES), and the WISC-R Full Scale Intelligence Quotient. Differences, where they exist (other than differences in processing abilities), were not considered to be significant, and were considered not likely to impact on the results of this study.

Procedure

The procedure consisted of the collection of spontaneous language samples in dyadic interactions. Initially, each subject met with the experimenter, independent of the other subjects, for one-half hour for the purposes of

familiarization. During the three following sessions, each subject was videotaped and audiotaped for one hour each session in spontaneous conversation with the experimenter, a peer, and the subject's Mother. These sessions all took place in a studio familiar to the subjects containing a set of common age-appropriate toys, books, and furniture (e.g., cars, pick-up sticks, balls, school materials, and packaged sets of toys such as those with a "dinosaur" theme, a "space" theme, and a "military" theme). These tapings were held independent of the other subjects.

The peer was chosen for his likelihood of conversing easily with the subject, as well as his familiarity with the subject. In addition, the peers were restricted to male participants. The Mother was chosen as the third participant for the subject to interact with as this parent was more easily available, and was more likely to have played a role in the development of the child's language abilities.

Within each session, the participants were allowed to self-select the toys and objects with which they wanted to play. The only constraint placed on the interaction within each session was that the participants were to begin the session with a puppet play. For this purpose, the participants were provided with three abstract puppets, that in some sense resembled human beings. They were instructed that they were to choose the puppet they wished to play with, and to maintain their puppet play for approximately 15 minutes. This particular constraint was employed to motivate, and initiate, interaction between the subject and the participant.

The interactions were taped on three days across a one week period. All taping sessions were accomplished within the morning hours of the school

day, and no subject, peer, or mother participated in more than one interaction on any one day. Furthermore, no subject participated during the same hour of the morning across the three taping days as it was suspected that any one child might interact and maintain conversation at one time of the morning better than another.

Coding of the Data

A total of three hours of spontaneous conversational interaction for each subject constituted the initial data base--one hour in conversation for each subject with each of the conversational partners, experimenter, peer, and mother. This primary data base was reduced to a total of one-and-one-half hours for each subject, reducing the sample with each conversational partner to 30 minutes by deleting the first 15 minutes and the final 15 minutes of each one hour sample. The rationale for this reduction was that the initial and final segments of each interaction were more likely to be periods when interaction between the subjects and their conversational partners would be slow, either due to unfamiliarity with the experimental conditions or initial indecisions as to the topic of conversation, and fatigue from conversing in a situation with minimal options for movement or spontaneous events which would influence the conversation from outside the pair, making the burden of conversation rest with the individuals. The center-most 30 minutes was determined more likely to be representative of the communicative competence of the subjects, and more interactive. (It should be noted here that this procedure eliminated the puppet play, the only imposed constraint, from the data base for each subject.)

Orthographic transcription of the verbal portion of the interactions was obtained from audiotapes. Videotapes were used to add the nonverbal portion

to the already transcribed verbal portion. All tapes were transcribed by the investigator of this study.

Completed transcriptions for each subject by experimenter, peer, and mother included all utterances, notation of other vocalizations, notation of totally and partially unintelligible utterances, nonverbal behaviors associated with utterances and those that occurred between utterances, and information concerning the context in which the interactions occurred.

Scoring

Linguistic maturity. Several measures of verbal output were calculated for each subject as indices of that subject's linguistic maturity. These measures included Brown's Mean Length of Utterance (Brown, 1973); McCarthy's Mean Length of Response (Johnson, Darley, & Spriestersbach, 1963); Davis' Mean of Five Longest Responses (Johnson, Darley, & Spriestersbach, 1963); and the Number of One-Word Responses (Johnson, Darley, & Spriestersbach, 1963).

Syntactic analysis. As a measure of the language structure, or grammatical complexity, exhibited by the subjects of this study, the McCarthy-Davis system for classifying utterances was employed (Johnson, Darley, & Spriestersbach, 1963). This system is composed of two categories: Complete Responses--Functionally Complete But Structurally Incomplete, Simple Sentences Without Phrases, Simple Sentences With Phrases, or With Compound Subject, Object, or Predicate, Complex and Compound Sentences, and Elaborated Sentences; and, Incomplete Responses.

Semantic analysis. In order to examine the semantic concepts encoded by the subjects in their utterances, Bloom and Lahey's Twenty-One Semantic Categories (Bloom & Lahey, 1978). The categories included were Existence,

Nonexistence, Recurrence, Rejection, Denial, Attribution, Possession, Action, Locative Action, Locative State, State, Quantity, Notice, Time, Coordinate, Causality, Dative, Specifier, Epistemic, Mood, and Antithesis.

Syntactic/semantic analysis. In order to characterize the interaction between these two areas of linguistic productivity, syntax and semantics, Bloom and Lahey's grid for Content/Form (Bloom & Lahey, 1978, pp. 382-382) was employed. Though the authors did not intend the use of this grid for the purposes of analysis, it was determined that the Content/Form grid would best display the interactive qualities of each subject's use of both syntax and semantics.

The grid employs the same Twenty-One Semantic Categories identified above. Each category is defined by a developmental scheme consisting of eight phases. Not all categories are developmentally acquired or in evidence in all eight phases. Each category is further defined by the necessary constituents to be placed in that phase (e.g., Existence, Phase One, single word; Existence, Phase Two, relational word plus substantive word). Certain of these further definitions within each phase may be optional.

Criteria for a particular subject with respect to that subject having evidenced a phase/category was based on productive use of that phase/category. Considering the length of the current samples of interaction obtained in this study, productive use was defined as eight to ten occurrences as the criterion level to be obtained for scoring as productive at a particular phase/category.

Pragmatic analysis. Gallagher's Model of Conversational Analysis (Gallagher, Note 3) was employed here to examine the pragmatic features of the oral language production exhibited by the subjects of this investigation.

This model of conversational analysis consists of two categories--Utterance Pairs, and Topical Units.

Each Utterance Pair from each transcription, Experimenter-Subject, Peer-Subject, and Mother-Subject, for each subject was analyzed for the following: (1) Comment and Acknowledgement, including Stereotyped Acknowledgement, Repetition Acknowledgement, Extension Acknowledgement, and Extension-Repetition Acknowledgement; (2) Comment and Contingent Query, including Request for Confirmation, Neutral Contingent Query, and Request for Specific Constituent Repetition; and (3) Contingent Query and Response, including Yes-No, Repetition, Elaboration Revision, Reduction Revision, Phonetic Change Revision, and Substitution Revision. Whereas all three abovementioned Utterance Pairs were scored only when they were initiated by the conversational partner (i.e., the conversational partner initiated the Comment and the Acknowledgement of the subject was scored; the conversational partner initiated the Comment and the Contingent Query of the subject was scored; and the conversational partner initiated the Contingent Query and the Response of the subject was scored), the last of the Utterance Pairs to be examined, (4) Request and Answer, was scored both for requests initiated by the conversational partner and answered by the subject, and those requests initiated by the subject and answered by the partner. It should be noted further that in the previous Utterance Pairs it was the second utterance of the pair that was examined; with Request and Answer, it is the first utterance which was inspected and scored.

Request and Answer Utterance Pairs were analyzed by examining the characteristics of the request. Three features were scored, including the

structure of the request (i.e., were the constraints imposed by the request appropriate for the answer?, e.g., in a Yes-No question, in a Wh-question); the sincerity of the request (i.e., was it a request actually intended to gain information, or was it a request that was insincere?); and, the directness of the request (i.e., the "extent to which a speaker's intent is explicitly encoded" (Gallagher, Note 3)).

Finally, it should be noted that the previous two types of Utterance Pairs involving the use of questions (Comment and Contingent Query, and Contingent Query and Response) are devices used within the conversational setting to repair the flow of the conversation. They are devices which aid in the clarification of previous utterances so that the flow of the conversation can continue. Requests, on the other hand, are devices that secure information, actions, or objects from the conversational partner.

The second category used in analyzing the conversation of the subjects was that of Topical Units. First, each topic initiated by the subject or conversational partner was scored as to whether or not it contained the pre-requisites necessary for the establishment of a topic (i.e., securing the listener's attention, clearly articulated utterances, identification of the referents inherent in the topic, and identification of the semantic relations between the referent and the topic). Any topic initiation that did not include these pre-requisites was deleted from further analysis.

For topics successfully initiated, they were further scored for the way in which they were established (i.e., the use of overt markers, questions, or statements). Also scored were the number of speaker-turns necessary for the establishment of a topic, both by the subject and the conversational

partner. The number of topics successfully established, and the number of turns at speaking within topics was calculated for both subjects and conversational partners. Finally, the analysis of the Topical Units involved the scoring of the utterances within those units to determine how the subjects related to the topic--either through collaboration (dealing with the established topic) or incorporation (dealing with an aspect of the established topic, but essentially introducing a new topic related to the previously established topic). This calculation for collaboration and incorporation was completed for both topics established by the subject, and those established by the conversational partner.

Results

A total language sample of 3,033 language events was obtained for the subjects of this study. A total of 820 language events was obtained for Matthew A., a total of 1,014 language events for Mark V., and a total of 1,199 language events for John N. Two percent or less of the transcriptions were transcribed as totally unintelligible, one percent or less as partially unintelligible, and five percent or less as estimated either in part or in total.

Reliability

The findings of the present investigation were evaluated for their reliability. Both transcription and scoring of the utterances within the transcriptions were evaluated.

Comparisons for the purposes of reliability were based on approximately

10% of the data base. Three three-minute segments, one from each of the three settings of interaction, for each subject were re-transcribed and re-scored for semantic analysis, syntactic/semantic analysis, and pragmatic analysis by an independent observer. The original transcriptions by the experimenter served as the data base for the reliability comparisons for linguistic maturity measures and syntactic analysis. All segments for re-transcription and re-scoring were randomly selected from the total data base.

Re-transcription of the data by the independent observer yielded a high percentage of agreement, approximately 91%, with the original transcription of the data by the experimenter. Re-scoring of these same segments by the independent observer yielded approximately 92% agreement for semantic analysis, approximately 85% agreement for syntactic/semantic analysis, and approximately 84% agreement for pragmatic analysis.

Re-scoring for linguistic maturity and syntactic analysis yielded approximately 86% agreement with the original scoring.

Linguistic Maturity

As can be seen in Table 2, the greatest over-all mean MLU was scored by John N. (4.72), followed by Mark V. (4.58), and then Matthew A. (4.27). The greatest over-all mean MLR was again scored by John N. (5.19), followed by Mark V. (4.87), and then Matthew A. (4.17). This pattern was maintained for the over-all mean M5L (John N.: 13.27; Mark V.: 11.67; Matthew A.: 10.33). The pattern was somewhat changed when analyzing the over-all mean Number of One-Word Responses with John N. still scoring the at the highest (13.33), followed by Matthew A. (11.67), and then Mark V. (9,67).

TABLE 2

THE OVER-ALL MEAN MEAN LENGTH OF UTTERANCE (MLU), MEAN LENGTH OF RESPONSE (MLR), MEAN OF FIVE LONGEST RESPONSES (M5L), AND NUMBER OF ONE-WORD RESPONSES FOR EACH SUBJECT ACROSS THREE CONVERSATIONAL PARTNERS

	Subjects		
	Matthew A.	Mark V.	John N.
Over-all ($\bar{X}$) MLU	4.27	4.58	4.72
Over-all ($\bar{X}$) MLR	4.17	4.87	5.19
Over-all ($\bar{X}$) M5L	10.33	11.67	13.27
Over-all ($\bar{X}$) N1W	11.67	9.67	13.33

Syntactic Analysis

Based on 150 utterances, 50 consecutive utterances from each interactional setting, for each subject, the syntactic analysis using the McCarthy-Davis classification system revealed variable differences in frequencies for each of the categories. Presented here, see Table 3, will be the results collapsed into three superordinate categories of syntactic construction. The first category was that of Simple Syntactic Constructions, and was compiled using the following McCarthy-Davis categories: Simple Sentences Without Phrases, and Simple Sentences With Phrases, or With Compound Subject, Object or Predicate. The second category was that of Complex Syntactic Constructions, and was

TABLE 3

TOTAL FREQUENCIES AND PERCENTAGE FREQUENCIES FOR

SUPERORDINATE SYNTACTIC CONSTRUCTIONS FOR EACH SUBJECT

	Subjects					
	Matthew A.		Mark V.		John N.	
Syntactic Categories	N	(%)	N	(%)	N	(%)
Simple Syntactic Constructions	61	(41)	73	(48)	59	(40)
Complex Syntactic Constructions	19	(13)	22	(15)	31	(20)
Other	70	(47)	55	(37)	60	(40)
TOTAL	150	(100)	150	(100)	150	(100)

compiled using the findings of the following categories: Complex Sentences, and the Elaborated Sentences. The final superordinate category was that of Other, and was compiled using the findings of the following McCarthy-Davis categories: Functionally Complete But Structurally Incomplete Responses, and Incomplete Responses.

These three superordinate categories of syntactic construction aid in depicting frequency differences between the three subjects with regard to the syntactic constructions each exhibited in the interactional settings observed in this study. By examining Table 3, it can be seen that Mark V. exhibited a greater usage of Simple Syntactic Constructions (48%) than did Matthew A.

(41%) or John N. (40%). Further, it can be seen that John N. exhibited a greater usage of Complex Syntactic Constructions (20%) than did either Mark V. (15%) or Matthew A. (13%).

Semantic Analysis

Using Bloom and Lahey's Twenty-One Semantic Categories (1978) in the analysis of the subjects' displayed semantic competence, provided little differences between the percentage frequencies for each of the subjects. Several differences, however, should be noted.

A comparison of the percentage frequencies in the semantic category of Existence exhibits a difference between subjects with Mark V. having a percentage frequency of 35%, John N. of 22%, and Matthew A. of 17%. When comparing the percentage frequencies in the category of Denial, the greater frequency occurrence within the language sample of Matthew A. (10%) should be examined in comparison to the percentage frequencies for Mark V. (6%) and John N. (6%). Another difference that should be highlighted was the relative discrepancies between the percentage frequencies for the category of Attribution for John N. (14%), Matthew A. (10%), and Mark V. (8%).

Generally, it appears from this analysis of the semantic encodings of the subjects that only minimal differences in percentage frequencies exist with respect to a majority of the semantic categories.

Syntactic/Semantic Analysis

Further analysis of the semantic categories for each subject by assigning each utterance within each category to its appropriate phase resulted in a greater differentiation among subjects. A summary of this analysis will be presented here.

Comparing the subjects' percentage frequency in the highest phase within each category, John N. was found to have exhibited the greatest percentage frequency in 12 of the semantic categories (Nonexistence, Recurrence, Rejection, Denial, Action, Locative Action, Notice, Coordinate, Dative, Specifier, Epistemic, and Antithesis), followed by Matthew A. who exhibited the greatest percentage frequency in nine of the semantic categories (Denial, Attribution, Possession, State, Quantity, Dative, Epistemic, Mood, and Antithesis), and finally, Mark V. who exhibited the greatest percentage frequency in eight of the semantic categories (Existence, Action, Locative State, Time, Causality, Dative, Epistemic, and Antithesis). Removing those phase/categories where more than one subject obtained the highest percentage frequency, the results indicate that John N. still maintained the greatest number of categories with the highest percentage frequency (a total of seven, Nonexistence, Recurrence, Rejection, Locative Action, Notice, Coordinate, and Specifier), followed by Matthew A. (a total of five, Attribution, Possession, State, Quantity, and Mood), and Mark V. (a total of four, Existence, Locative State, Time, and Causality).

Comparing the subjects' percentage frequencies in the highest phase within each category, it was found that Mark V. exhibited the lowest percentage frequency of the three subjects in nine semantic categories (Nonexistence, Recurrence, Denial, Attribution, Possession, Locative Action, State, Notice, and Specifier), followed by John N. with the lowest percentage frequency in six of the semantic categories (Existence, Attribution, Locative State, Quantity, Time, and Mood), and finally, Matthew A. with the lowest percentage frequency in five of the semantic categories (Recurrence, Rejection, Action, Coordinate, and Causality). Removing those phase/categories

where more than one subject obtained the lowest percentage frequency, the results indicate that Mark V. still maintained having the greatest number of categories with the lowest percentage frequencies (a total of seven, Nonexistence, Denial, Possession, Locative Action, State, Notice, and Specifier), followed by John N. (a total of five, Existence, Locative State, Quantity, Time, and Mood), and Matthew A. (a total of four, Rejection, Action, Coordinate, and Causality).

John N. had the fewest number of syntactic/semantic phase/categories which were determined not to be in productive use at the highest phase/category level within the interactions of the present study (a total of two, Coordinate and Causality), followed by Matthew A. (a total of five, Recurrence, Notice, Coordinate, Causality, and Antithesis), and finally, Mark V. with the greatest number (a total of eight, Nonexistence, Recurrence, Possession, State, Notice, Coordinate, Causality, and Antithesis).

In summary, it appears as though when both syntax and semantics, and their interaction, are considered together differences in the productive use between the subjects are more apparent.

Pragmatic Analysis

Selected results will be presented here concerning the pragmatic competence of the subjects of this study as the volume of data available exceeds the limitations of this paper.

Utterance pair--comment and acknowledgement. By examining Table 4, it can be seen that the most productive type of verbal acknowledgement used by Matthew A. following a comment by a conversational partner was the Stereotyped Acknowledgement (20% of his total use of acknowledgements);

TABLE 4

THE FREQUENCIES AND PERCENTAGE FREQUENCIES OF TYPES OF ACKNOWLEDGEMENTS EXPRESSED BY SUBJECTS WHEN RESPONDING TO COMMENTS INITIATED BY CONVERSATIONAL PARTNERS

	Subjects					
	Matthew A.		Mark V.		John N.	
Acknowledgement Types	N	(%)	N	(%)	N	(%)
Stereotyped Acknowledgement	72	(20)	52	(14)	82	(22)
Repetition Acknowledgement	16	(4)	16	(4)	16	(4)
Extension Acknowledgement	52	(14)	97	(26)	160	(43)
Repetition-Extension Acknowledgement	33	(9)	36	(9)	84	(22)
Comments Unacknowledged	195	(52)	179	(47)	33	(9)
TOTAL	372	(100)	380	(100)	375	(100)

by Mark V. and John N., the Extension Acknowledgement (26% and 43% respectively). By comparing the three subjects, the results indicate that John N. used a greater percentage of Stereotyped, Extension, and Repetition-Extension Acknowledgements than did either Matthew A. or Mark V. Finally, perhaps the greatest difference between subjects can be found in the percentage frequencies

of those comments that were not verbally acknowledged by the subjects. Matthew A. had the greatest percentage frequency of unacknowledged comments (52%), followed by Mark V. (47%), and finally, John N. (9%).

In summary, these data indicate an apparent lack of usage of the higher forms of verbal acknowledgements, and a greater frequency of not verbally acknowledging the comments of the conversational partner, by both Matthew A. and Mark V. in comparison to John N.

Topical units: number of topics and turns within topical units. Table 5 presents the results regarding the frequency and percentage frequency for topics initiated by the subjects and for those initiated by the conversational partners. It is clear from these results that both Matthew A. and Mark V. initiated fewer topics than did their conversational partners (Matthew A. having initiated 32% of the topics in comparison to his conversational partners who initiated 68% of the topics; Mark V. having initiated 39% of the topics in comparison to his conversational partners who initiated 61% of the topics), whereas John N. initiated topics with nearly the same frequency as did his conversational partners (John N. having initiated 50% of the topics and his partners having initiated 50% of the topics).

Results concerning the mean number of conversational turns within the topical units will also be found in Table 5. These results indicate that the mean number of conversational turns within topical units initated by subjects, Matthew A. and Mark V., were lower than the mean number of conversational turns within topical units initiated by their conversational partners. On the other hand, the mean number of conversational turns within topical units initiated by John N. was greater than that of his conversational partners.

TABLE 5

THE FREQUENCY AND PERCENTAGE FREQUENCY OF TOPICS INITIATED BY SUBJECTS AND TOPICS INITIATED BY CONVERSATIONAL PARTNERS, AND THE MEAN NUMBER OF TURNS WITHIN TOPICS INITIATED BY SUBJECT AND TOPICS INITIATED BY CONVERSATIONAL PARTNERS

	Topics Initiated By Subject		$\bar{X}$ Turns Per Unit	Topics Initiated By Partner		$\bar{X}$ Turns Per Unit	Total N of Topics	(%)
	N	(%)		N	(%)			
Matthew A.	35	(32)	8.17	75	(68)	12.35	110	(100)
Mark V.	69	(39)	6.06	109	(61)	8.53	178	(100)
John N.	67	(50)	10.66	68	(50)	8.79	135	(100)

Topical units: speaker-turns necessary for the establishment of a topic. Table 6 presents the number of speaker-turns and the mean number of speaker-turns necessary for the establishment of a topic both for the subjects and for their conversational partners. A comparison of the mean number of speaker-turns for the successful establishment of a topic by the subjects reveals that John N. (with a mean of 1.03) was able to establish a topic in fewer speaker-turns than either Matthew A. ($\overline{X}$ 1.46) or Mark V. ($\overline{X}$ 1.38). It can also be seen that the conversational partners of Mark V. were able to establish a topical unit with fewer speaker-turns ($\overline{X}$ 1.04) than either the conversational partners of Matthew A. ($\overline{X}$ 1.13) or John N. ($\overline{X}$ 1.15).

Comparing the number of speaker-turns necessary for the successful establishment of a topic within the conversations of each subject, the results reveal that the conversational partners of both Matthew A. and Mark V. used a fewer number of speaker-turns than did the subjects themselves ($\overline{X}$ 1.13 compared to $\overline{X}$ 1.46, and $\overline{X}$ 1.04 compared to $\overline{X}$ 1.38, respectively). On the other hand, the conversational partners of John N. employed a greater number of speaker-turns in the establishment of a topic than did the subject himself ($\overline{X}$ 1.15 compared to $\overline{X}$ 1.03).

In summary, it would appear from the results presented above that the learning disabled subjects of this study use lower forms of acknowledgement, often do not verbally acknowledge the comments of their conversational partners when obligated to do so, generally initiate fewer topics with fewer turns per topical unit, and employ a greater number of speaker-turns in the establishment of a topic than does the normal subject.

TABLE 6

THE FREQUENCY AND MEAN NUMBER OF SUBJECT-AS-SPEAKER TURNS AND PARTNER-AS-SPEAKER TURNS FOR THE ESTABLISHMENT OF TOPICS IN THE CONVERSATIONS OF EACH SUBJECT

	Subjects					
	Matthew A.		Mark V.		John N.	
Initiator of Topic	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$
Subject-Speaker Turns for Establishment of Topic	51	1.46	95	1.38	69	1.03
Partner-Speaker Turns for Establishment of Topic	85	1.13	113	1.04	78	1.15

Discussion

The suggested and observed similarities and differences between the three subjects of this study--Matthew A., a learning disabled child evidencing auditory processing deficits, Mark V., a learning disabled child evidencing visual processing deficits, and John N., a normal child--leads to the development of continua reagrding their competence in orally expressing language, syntactically, semantically, and pragmatically. Were the three subjects placed on a continuum for linguistic maturity, Matthew A. would appear at the lowest end, followed by Mark V., and finally, John N. at the

highest end of the continuum. Were the subjects placed on a continuum for syntactic development, Matthew A. would appear at the lowest end, followed closely by Mark V., and finally, John N. at the highest end, more separated from Mark than Mark was from Matthew. Were the subjects placed on a continuum for syntactic/semantic encoding, Mark V. would appear at the lowest end of the continuum, followed by Matthew A. rather closely, and finally, John N. at the highest end, again more separated from Matthew than Matthew from Mark. Finally, were the three subjects placed on a continuum for pragmatic competence, both Matthew A. and Mark V. would appear together at the low end of such a continuum, and John N. would appear at the high end. Though this ordering is suggested from the present research, the evidence contained herein does not make it possible to devise such scaled continua. The construction of such scaled continua will have to await further investigations. However, Figure 1 is based on the above suggestions.

Results of the present study, in the very least, suggest the re-examination of previous studies of the oral language capacities of the learning disabled population (e.g., Wiig, Lapointe, & Semel, 1977; Wiig & Roach, 1975; Wiig & Semel, 1973; Vogel, 1974). The present findings suggest that there may indeed be intergroup differences within the population identified as learning disabled, and thereby casts doubt on the generalizability of previous research which did not differentiate the population of learning disabled children studied as to their particular deficits. Though Wiig and Semel (1976) readily admit that there may be individual differences between members of the learning disabled community, they generalize their findings to all learning disabled children. Consequently, they overlook the possibility

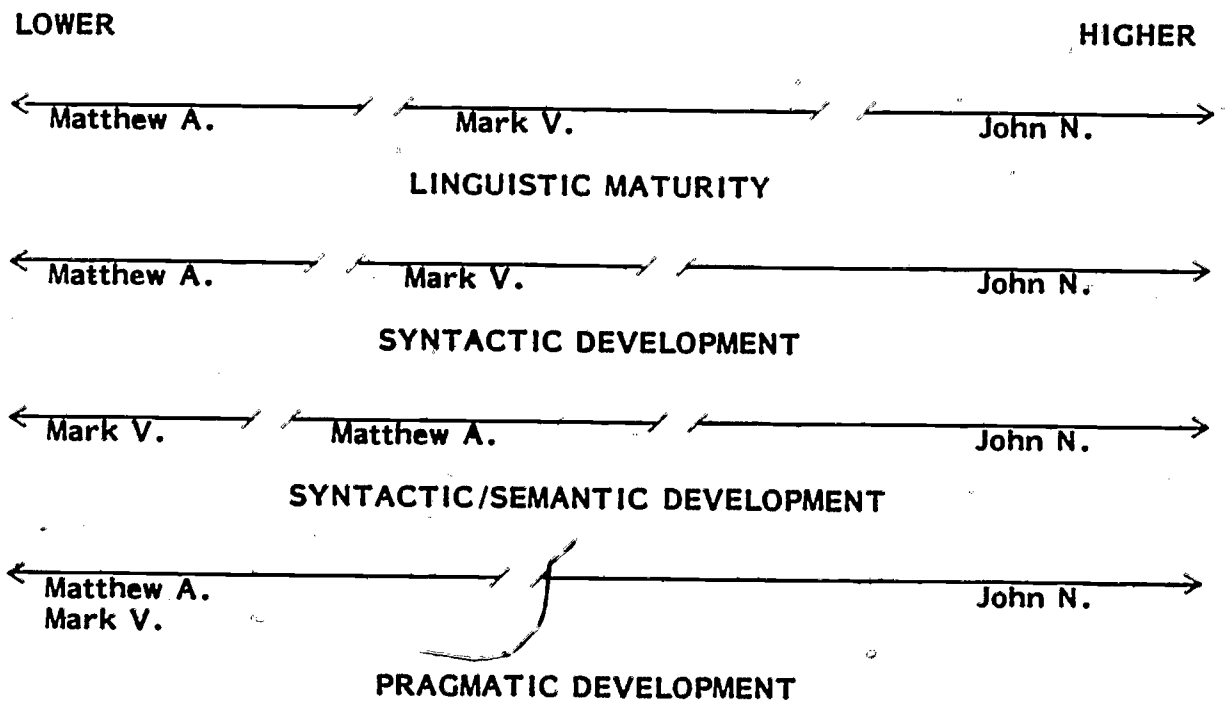

Figure 1. Continua representing suggested and observed similarities and differences in the communicative competence of Matthew A., Mark V., and John N.

that consistent differences may be found which affect one or another subgroups of the population defined as learning disabled. The present study serves the purpose of opening this issue to future investigation, and further clarification of the subgroup language characteristics which may be consistent within a particular subgroup and not found, or found in varying degree, in another subgroup.

Several possible limitations exist with respect to the present study. First, the small sample size precludes the possibility of generalizing the results to the studied subgroup populations of the learning disabled. Moreover, the small sample size increases the possibility that the results may be due to chance variability. Several discrepancies were noted with respect to the optimal criteria for selection of the subjects when considering the psycho-educational instruments employed. However, since the results, in total, of the various instruments employed did indicate the suspected processing deficits in the case of the learning disabled subjects, or the lack of processing deficits as in the case of the normal child, as well as the additional data which supported these deficits (or lack of deficits), i.e., school records, medical histories, teacher reports, family interviews, it was determined that the subjects were appropriately classified, and did meet the necessary criteria for the present study.

While there were several possible limitations, as suggested above, the over-all outcome of the study has a number of positive features. First, massive amounts of data were collected regarding each of the subjects. The data accumulated for each subject allowed for the specific identification of the subjects. It provided descriptive information, much of which may prove to

influential in determining the language development of such children. In addition, the collection of these data allowed for a better match of the subjects of this study in that more areas of possible variation were able to be controlled.

Second, by employing the single-subject design, the data obtained concerning the language capacities of each subject were able to be more extensive than would be allowed by another design. The present design allowed for the minute analyses of the language capacities of the subjects within conversational interaction as opposed to an experimental, large sample design which would have necessitated controlling the amount of data amassed.

Finally, the present design allowed for excessive care to be taken in all aspects of the study, including subject selection, procedures for collecting data, and the data analyses. Only through such methodology as employed here will researchers in the field of learning disabilities be better able to identify and characterize this population, and its subgroups.

The present study provides evidence, though somewhat limited, that intergroup differences may exist in the population defined as learning disabled with regard to their oral language competencies. Future research might be directed toward the following points. First, an increase in the number of children examined in each cell so that the statistical significance of the similarities and differences could be determined. Experimental designs, which include detailed descriptive information and subject selection procedures, should be conducted to further explore the oral language competence of the subgroups of the learning disabled. Third, and of particular importance,

would be investigations regarding the high frequency of no verbal response by the learning disabled subjects observed in the analysis of Utterance Pairs. Though previous research (Gallagher & Darnton, 1978) indicates that language disordered do not differ from normal children in their frequency of no verbal response, the present data indicate otherwise. Data in the present investigation were collapsed across the three conversational partners, and analyzed as such to provide a more complete description of the communicative competence of the subjects. Future investigations might be designed in such a manner as to compare the competence of the learning disabled subjects as indicated in conversation with different partners. Finally, investigations of the interaction between deficiencies in syntactic and/or semantic oral language production, and pragmatic oral language production should be undertaken. The observed deficiencies in the pragmatic oral language competence of the learning disabled subjects of this study may be due to their deficiencies in constructing syntactically adequate utterances and/or deficiencies in encoding semantic categories. In other words, the cognitive workload may be too great in one area, and thereby present deficits in another area, not because the child is deficient but instead due to the structure of the task and the child's capacity for handling that task.

Through such continued study of the oral language competence of the subgroups of learning disabled children, it may be possible to answer many questions regarding the language competence of these children, and the various subgroups of these children, in spontaneous conversational interaction.

Footnotes

[1]It should be noted here that the last initial used with each subject's name was employed not only to protect the identity of the subject, but also, to indicate, for purposes of readability, the specific identifying variable associated with each subject--A. = auditory processing deficits; V. = visual processing deficits; and N. = normal.

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