A STUDY OF THE EFFECTS OF A SHORT TERM TRAINING PROGRAM IN THE USE OF PRAGMATIC STRATEGIES ON THE LANGUAGE, PRAGMATIC AWARENESS AND PRAGMATIC BEHAVIOR OF LEARNING-DISABLED CHILDREN

by

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THE EFFECTS OF A SHORT TERM TRAINING PROGRAM IN THE USE OF PRAGMATIC STRATEGIES ON THE LANGUAGE, PRAGMATIC AWARENESS AND PRAGMATIC BEHAVIOR OF LEARNING-DISABLED CHILDREN

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ABSTRACT

Recent research in social problems of learning-disabled children has indicated that communication difficulties may be one source of their social unpopularity. Other studies have revealed that learning-disabled children are less metacognitively aware than their normally-achieving peers. This study addresses these two problems. If learning-disabled children lack awareness of their socio-linguistic processes, then training them to use socio-linguistic strategies should improve their ability to communicate effectively.

In Part A of this study, 30 learning-disabled and 15 normally-achieving grade five children, randomly selected from eight schools in Burnaby, British Columbia, were individually taught a board-game. Subsequently, the child had to teach this game to a peer and a first-grader. Transcripts of the recorded sessions were scored for linguistic complexity and use of socio-linguistic strategies of planfulness. Moreover, a questionnaire was administered after each session to measure socio-linguistic awareness, self-evaluation of performance and belief about locus of control. Results show that, in communicating with a partner, the learning-disabled children were less aware of socio-linguistic strategy and used fewer strategies of planfulness than their normally-achieving peers. However, the language of the learning-disabled children was as complex and they modified their language in communicating with younger children as much as the normally-achieving peers. The learning-disabled children gave as many internal locus of control type responses as the normally-achieving peers. Furthermore, neither the learning-disabled children nor the normally-achieving children were accurate when evaluating their own performance.

In Part B of the study, 15 of the learning-disabled children were trained for one half hour a day for three days to use socio-linguistic strategies of planfulness. The remaining 15 engaged in an irrelevant task. Posttests followed training. To test for maintenance and generalization of learned skills, the trained group was asked to teach the board-game and another game to a peer and a first-grader four days after the posttest.

Results indicated that training increased socio-linguistic awareness and the use of socio-linguistic strategies of planfulness of learning-disabled children. The number of internal locus of control responses of the trained group also increased; whereas, the accuracy of self-evaluation of successful performance did not. Interestingly, the language of the trained group increased in complexity after training. Use of pragmatic strategies and linguistic complexity increased further at the maintenance test. However, generalization of the trained skills and of the changes in linguistic complexity was not observed.

Learning-disabilities professionals may be encouraged by the positive effects of the short-term training program on the language and strategic behavior of learning-disabled children. The study indicates a need for further research on short-term training effects of metacognitive skills on the socio-linguistic performance of learning-disabled children as well as a need for a more refined analysis of language problems in learning-disabled children.

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I. INTRODUCTION

Context of the Problem

Learning-disabled children, in spite of average or above average intelligence and intact physical and emotional constitution, perform poorly in academic areas such as reading and arithmetic. Furthermore, in socio-linguistic interactions, they tend to be less competent than their normally-achieving peers (Bryan, 1978).

Recent theoretical developments have pointed towards verbal-mediation or communication problems (Bryan, 1978; Vellutino, 1977) and lack of metacognitive awareness (Torgesen & Goldman, 1977; Wong, 1978) as being possible sources of learning-disabled children's social and academic failures. Learning-disabled children have been shown to be less competent in all areas of linguistic ability: phonological awareness (Shankweiler & Lieberman, 1971); syntax (Adams, 1977; Fry, Johnsen & Muehl, 1979; Wiig and Semel, 1976); semantics (Perfetti & Goldman, 1976; Wiig, Semel & Crouse, 1973) and pragmatics (Bryan, 1978; Smiley, Oakley, Worthen, Campione & Brown, 1973).

Additionally, findings that learning-disabled children tend to be passive in their own learning and in their social relationships with adults and peers (Bryan, Pearl & Donahue, 1978; Ladd, 1979; Torgesen, 1978) appear to make Flavell's (1975) hypothesis on production deficiency applicable to describing learning-disabled children's performance problems.

The distinction between ability and performance deficits was highlighted by Torgesen (1977) and is supported by studies in which learning-disabled children had been successfully trained to produce social (Ladd, 1979) and memorial strategies at levels equal to their normally-achieving peers (Torgesen & Goldman, 1977; Wong, 1978). Clearly, both sources of learning-disabled children's problems; namely, socio-linguistics and metacognition, deserve further empirical attention.

Statement of the Problem

Previous research has focused on either linguistic, metacognitive or attitudinal characteristics of learning-disabled children. The main purpose of this study is to examine primarily linguistic and metacognitive and, secondarily, attitudinal characteristics of a group of learning-disabled children in comparison to their normally-achieving peers. A second purpose of the study is to examine the effects of training metacognitive skills of learning-disabled children in a semi-structured socio-linguistic situation. To address these purposes, the experiment is dealt with in terms of two parts, Part A and Part B: Part A comprises the comparison between learning-disabled and normally-achieving children on socio-linguistic, metacognitive and attitudinal characteristics; Part B the examination of the effects of training learning-disabled children in metacognitive skills.

Statement of Hypotheses

Part A of this study addresses the following hypotheses:

1. Learning-disabled children use less complex language than normally-achieving peers.
2. Learning-disabled children modify their language according to the age of their audience less than normally-achieving peers.
3. Learning-disabled children are less aware of the pragmatics of socio-linguistic interaction than normally-achieving peers.
4. Learning-disabled children use fewer pragmatic strategies in a socio-linguistic interaction than normally-achieving peers.
5. Learning-disabled children tend to respond with more external type of locus of control statements when evaluating their own performance than their normally-achieving peers.
6. Learning-disabled children are less accurate when evaluating their own performance than normally-achieving peers.

Part B of this study addresses the following hypotheses:

1. Training in pragmatic strategy use will increase the pragmatic awareness of learning-disabled children.
2. Training in pragmatic strategy use will increase the number of pragmatic strategies used by learning-disabled children.
3. Training in pragmatic strategy use will increase the number of pragmatic strategies used by learning-disabled children over time and on another

task.

4 . Training in pragmatic strategy use will increase linguistic complexity and linguistic modification of learning-disabled children.

5 . Training in pragmatic strategy use will increase the internal locus of control of learning-disabled children.

6. Training in pragmatic strategy use will increase the accuracy of self-evaluation of performance of learning-disabled children.

Rationale

Part A

This part of the study examines the linguistic and metacognitive characteristics of learning-disabled and normally-achieving children. The research background for the linguistic characteristics will be discussed first followed by that of the metacognitive and attitudinal characteristics.

Previous studies in learning disabilities have found that learning-disabled readers use sentences of simpler syntax and a smaller range of vocabulary than good readers (Adams, 1977; Bryan, 1978). This view of the learning-disabled child as one who uses less complex language than his normally-achieving peers was confirmed by results reported by Bryan and Pflaum (1978). When examining the language of learning-disabled children, Bryan and Pflaum found that learning-disabled children used less complex language and modified their language to a younger child less than normally-achieving children.

Since the constructs of linguistic complexity and linguistic modification are central to the arguments that follow, an explanation of these is warranted here. Linguistic complexity of language refers to the degree of linguistic sophistication of an utterance. Children begin speaking with one-word and two-word global sentences. As they mature cognitively, their sentences become more sophisticated and more complex. The complexity is derived from an increased linguistic ability to transform simple sentences to more intricate and accurate representations of meaning, through modifying, deleting or inserting structures. One way to measure the level of complexity or sophistication of oral language is to count the number of transformations (complexities) contained in one utterance of complete meaning, a t-unit.

Linguistically speaking, a t-unit is an independent clause with all of its dependent clauses attached to it (Hunt, 1965). Bryan and Pflaum (1978) used the t-unit method of analyzing the level of complexity of children's language. Their procedure for scoring language samples was obtained and followed in this study.

The construct of linguistic modification according to one's audience stems from Shatz and Gehlman's (1973) study where children as young as four years of age were found to modify the complexity of their language to children of two years and younger. The implication that learning-disabled children do not modify their language when communicating with younger children suggests that they may be less aware of the pragmatic constraints of socio-linguistic interaction.

This study is, in part, an attempt to replicate the findings of Bryan and Pflaum. It is, therefore, hypothesized that learning-disabled children use less complex language and modify their language to younger children less than their normally-achieving peers in a semi-structured socio-linguistic interaction.

The second purpose of Part A of the study is to examine the metacognitive characteristics of learning-disabled and normally-achieving children in the area of linguistics. Recent research developments in learning disabilities provide support for conceptualizing learning-disabled children as being 'inactive' learners with strategic deficits rather than ability deficits (cf. Torgesen, 1979). Learning-disabled children may lack appropriate task-approach strategies or metacognitive awareness rather than cognitive processing ability (Hallahan & Kneedler, 1979). In memorial tasks, learning-disabled children seem to be less organized or planful (Wong, 1978; 1981) and more passive (Torgesen, 1978) than their normally-achieving peers. However, the origin of learning-disabled children's passivity in learning remains an empirical question (Wong, in press).

This study therefore hypothesizes that in comparison to their normally-achieving peers, learning-disabled children are less metacognitively aware of the socio-linguistic constraints of the communication process, and, therefore, modify their language less to a younger audience. Furthermore, it is hypothesized that learning-disabled children use fewer pragmatic strategies of planfulness and organization in communication with others than normally-achieving peers.

Recent investigations into the affective and personality characteristics of learning-disabled children have confirmed the traditional view of the poor learner as having a poor self-concept. It has been found that learning-disabled children have not only poor but unrealistic self-concepts. They are less able to judge their status within the peer group than are normally-achieving learners (Bryan, 1978). Possibly this could be a self-protective device. However, there is evidence to suggest that this is not the only area in which learning-disabled children do not spontaneously rely on their own judgement but rely on external sources for evaluation of their performance on academic tasks as well (Bryan, 1980). These findings form the basis for the hypotheses that, in comparison to their normally-achieving peers, learning-disabled children respond with more external locus of control belief statements and are less accurate when evaluating their own performance.

Part B

This part of the study examines the effects of training learning-disabled children to be more aware of the pragmatic constraints of socio-linguistic interaction. Training in metacognitive skills has induced learning-disabled children to use effective strategies which were spontaneously generated by their normally-achieving peers (Torgesen & Goldman, 1977; Hallahan & Kneedler, 1979). It is therefore hypothesized that training in pragmatic awareness and strategy use will increase pragmatic awareness and increase the use of planfulness strategies of learning-disabled children.

While research demonstrates that it is possible to change the locus of control beliefs of children (Gilmor, 1978) these changes were the result of longitudinal studies. The effect of short-term training on the locus of control of learning-disabled appears to be of empirical interest and therefore Part B of this study includes analyses of the type of locus of control that the children's responses reflect.

As the training specifically included self-monitoring and self-evaluation of the children's performance, it was hypothesized that learning-disabled children after training in pragmatic awareness and strategy use would become more accurate at self-evaluation.

In a recent study, Ladd (1979) obtained positive results in training learning-disabled children in social skills. The method of training included modelling, instruction, rehearsal, feedback and self-evaluation. Increases in peer acceptance were maintained four weeks after the training, suggesting that training was effective in increasing social skills of learning-disabled children. Furthermore, Kestner and Borkowski (1979) obtained generalization and maintenance when statements of the general validity and usefulness of the trained skills were incorporated into the program. Kestner and Borkowski's methodology was used in the training procedure of this study. It was therefore hypothesized that maintenance and generalization effects would be obtained when training learning-disabled children to use pragmatic strategies.

Because, there are no empirical precedents from which to predict the effects on the language of learning-disabled children of short-term training in pragmatic awareness and strategy use, it is difficult to hypothesize that training will increase the linguistic complexity or the linguistic modification behavior of learning-disabled children. However, it is an interesting empirical question and I shall include analyses of the linguistic data in Part B of this study.

II. REVIEW OF LITERATURE

The following is a review of the literature on the linguistic, metacognitive and attitudinal characteristics of learning-disabled children. First, I shall examine the empirical evidence for the hypothesis that learning-disabled children have reading and communication problems because of linguistic deficiencies. This examination will centre on research in phonology, syntax, semantics and pragmatics. Second, I shall examine available research on the metacognitive skills of learning-disabled children. Here the literature review will revolve around the concept of the learning-disabled child as an 'inactive learner' which also serves as a context for discussing locus of control belief characteristics of learning-disabled children.

Linguistic Characteristics

As early as 1896 and as late as the 1960's, the failure of a child to learn to read was attributed to a deficit in the perceptual processing of printed material per se. A proponant of this theory was Orton (1925, 1936) and later, Bender (1956) Birch (1962) and Herman (1959) who hypothesized that visual processing and visual memory problems were the cause of dyslexia. Vellutino (1977) however, contends that:

> The inaccuracies that characterize the poor readers' processing of visual material may be due not to their inability to stabilize 'visual-spatial' relationships but rather to their difficulty in establishing 'visual-verbal' relationships. (p. 335)

To support his view, Vellutino marshalled empirical evidence from his own studies (1972, 1973, 1975) and from others such as Lieberman, Shankweiler, Orlando, Harris and Bert (1971) who suggested that:

> ... the positional and directional errors commonly observed in poor readers are linguistic intrusion (mislabeling) errors rather than perceptual inaccuracies (Vellutino, 1977, p. 339).

In studies in which visual processing was not confounded by verbal encoding abilities and previous reading experience, poor readers performed comparably to good readers (Vellutino, Pruzik, Steger and Meshoulam, 1973; Vellutino, Steger, Kaman and DeSetto, 1975). Moreover, in an ingenious study, Morrison, Nagy and Giordani (1977) cast grave doubts on the perceptual deficits hypothesis of learning disabilities.

Using a task designed to separate perceptual processing from memory, Morrison et al. (1977) found that (1) poor readers did not differ in performance from normal readers during the perceptual phase, (2) normal readers were significantly better than poor readers during the encoding-memory phase, and (3) the performance superiority of normal readers held across verbal and nonverbal stimuli (letters, geometric forms and abstract forms). These findings leave no doubt that an information processing model of reading disability is more plausible than the perceptual deficit explanation of reading disability. Morrison et al. suggested that the indication among poor readers of a striking deficit during the 300 to 2000msec interval of information processing "argues that reading disability involves some problem in information processing in stages following initial perception, perhaps in encoding, organization, or retrieval skills" (Morrison et al. 1977, p. 79). Moreover, the authors noted that the poor readers showed consistently poor performance on verbal and nonverbal materials. Hence they suggested that the poor reader's difficulty may involve a more abstract ability underlying processing of both "labelable and unlabelable forms." However, the generality of the findings of Morrison et al. must be investigated with younger children. Clearly, the perceptual deficit hypothesis does not hold up to close scrutiny both theoretically and empirically and we must look elsewhere for the origin of the problem (Vellutino et al., 1977).

Vellutino (1977) suggested that dyslexia may be accounted for by a "verbal deficit theory". I now turn to research addressing this possible source of verbal deficits underlying learning-disabled children's poor academic performance. The broad term linguistics is usually divided into four areas: (1) phonology (2) syntax (3) semantics and (4) pragmatics. Much theory and research has been done in the first three areas of linguistics but only nascent research pertains to pragmatics.

Phonology

David Ingram, in his contribution to the colloquium "Normal and Deficient Child Language" (1976), proposes that a child's acquisition of phonology follows his general cognitive growth. Ingram outlines a possible sequence of six stages of phonological development and connects these with Piaget's stages of cognitive development.

Ingram asserts that phonology, generally assumed to have been acquired by the six-year old child, is in fact not complete, but continues to develop in the realm of abstract rule systems. Below are two examples of morphophonemic rule development:

a) the Vowel Shift Rule

Divine - divinity (ay) - (i)

Moskowitz (1973) points out that this vowel shift rule generalized from occurences in adult language, is not learned until the child is over six years old.

and

b) the Contrastive Stress Rule:

Noun Compound	Noun Phrase
greenhouse	green house

Atkinson-King (1973) demonstrated how a child must be able to generate this rule from his ability to reverse operations. That is, a five-year old does not know this rule; he is still functioning in a subperiod of the concrete operational stage. He is able to conserve but is unable to perform reversible operations. The closer a child is to twelve years, the more likely it is that he will know the contrastive stress rule. The more likely it is that he is able to perform reversible operations and the closer he is to the stage of cognitive development known as Formal Operations. Thus, phonological acquisition is still taking place when a child is starting school, beginning to read, and continues to take place well into his intermediate school years.

Research related to learning disabilities indicates that there does exist a difference between learning-disabled and normally-achieving children in phonological development or production. In a study by Naidoo (1972) children who were experiencing trouble in learning how to read were found to be more likely to have speech articulation problems than were children achieving normally at the reading task.

Poor readers have, also, been found to make more errors on the Wepman Auditory Discrimination Task (1960). This instrument has been often used as a screening device for poor readers in the elementary grades. However, as Vellutino (1977) points out, the W.A.D.T. may be confounding attention and memory processes with perceptual discrimination. Thus, it is not at all clear whether poor performance on the Wepman task is due to difficulties in discriminating between phonetic elements or to difficulties in other areas of cognitive processing.

Similarly, Shankweiler and Lieberman (1972) in studying the differences between good and poor readers on an oral repetition versus read word task, found that poor readers made more and different errors when reading words than when asked to repeat the same words orally. They suggest that poor readers are not so much having trouble perceptually discriminating the phonetic elements as being less consciously aware of the phonemic elements of spoken and written speech. Other studies cited by Vellutino (1977) support the notion that the skill of phonemic segmentation is dependent on maturational processes (Lieberman, Shankweiler, Fisher & Carter, 1974).

There are as yet few studies sampling the phonological behavior of poor readers at either the primary or the intermediate levels. We do not know whether a child failing at the reading task is producing speech that is phonologically at a variance with the achieving reader or is less aware of the elements of spoken and written speech than the achieving reader as proposed by Shankweiler and Lieberman (1972).

Mattingly has postulated (1971) that a) speech is a primary language activity and b) reading is a secondary language activity dependent on speaking and listening abilities. The dependency factor is that of the reader's awareness of the primary activity of language. Thus it follows that the person who is interested in his own speech; enjoys playing with his language (rhyming, puns, are given as examples); and is aware of the linguistic elements of his speech is going to be more likely to succeed at reading.

Mattingly argues that speech and reading acquisition cannot be parallel as "speech is easy, reading is hard" (p. 140). As he points out, speech is acquired mostly through an unconscious process whereas reading is usually acquired through a conscious learning process. Moreover, when the speaker/listener receives an aural message, he has an internal image of the utterance closely related to the phonological level of representation. In English, the relationship between orthography (spelling) and the internal phonetic/phonemic image is not closely related. Mattingly (1971) suggested that this added abtract element of the reading process is an important factor in making reading acquisition difficult.

> In the special case of alphabetic writing, it would seem that the price of greater efficiency in learning is a required degree of awareness higher than for logographic and syllabary systems, since as we have seen, phonological segments are less obvious units than morphemes or syllables. Almost any Chinese with ten years to spare can learn to read, but there are relatively few such people. In a society where alphabetic writing is used, we should expect more reading successes, because the learning time is far shorter, but proportionately more failures, too, because of the greater demand upon linguistic awareness. (p. 144)

Shankweiler and Lieberman (1971) in studying children's reading errors and how these errors are related to speech attempted to discover whether reversals are of optical or linguistic origin. They found that visual confusability was secondary to linguistic factors in reading errors. They also point out the need for further studies of cerebral-hemispherical laterality. Studying the differences in effect of mishearing and misreading , they concluded that:

> In regard to segment position, we concluded that children in the early stages of learning to read, tend to get the initial segment correct and fail on subsequent ones because they do not have the conscious awareness of phonemic segmentation needed specifically in reading but not in speaking and listening. (p. 314)

Savin (1971) in support of Mattingly's viewpoint explained that consciousness or potential consciousness of phonemic perception is the crucial issue in teaching a child to read.

> Suppose, for the sake of argument, that children up to a certain age segment speech into syllables but are incapable of analyzing syllables into shorter segments. For such children, /kaet/ and haet/ would simply be different sounds, as are /kaet/ and /dog/. Such a child can be a perfectly competent speaker and listener, but he will obviously be unable to make any sense of an alphabetic writing system. (p. 321)

There is little direct evidence that learning-disabled children produce phonologically inferior speech than normally-achieving children. However, learning-disabled children may be less aware of the phonemic elements of speech crucial to the acquisition of reading.

Syntax

Bryan (1978) cites, as does Vellutino (1977), a study by Fry, Johnson and Muehl (1970) investigating the relationship between oral language abilities and reading proficiency where good readers were found to have larger vocabularies than poor readers. Adams (1977) states that vocabulary is the single best predictor of a child's ability to comprehend written material. However, as Adams suggests, a child's vocabulary is directly related to his general linguistic experience which, in turn, is bounded, by his conceptual experience. Fry (1970), also found that poor readers "were distinguished on the complexity of their linguistic patterns; they used less sophisticated syntactic complexities and more "existance" type sentences. (eg. There is a dog.)

Vogel (1974), in conducting a battery of tests with dyslexic and average readers measuring nine syntactic skills, found significant differences between the two groups on seven out of nine tests; Comprehension of syntax, repetition of sentences, morphological usages, oral cloze tests and recognition of melody (Vellutino, 1977). Vogel concluded that syntactic facility is closely related to reading ability.

The acquisition of syntactical complexity continues to occur throughout the childhood years. Ingram (1975) suggests that this development is closely linked to a child's cognitive growth. For example, the production of relative clauses commonly does not occur until after the age of six when the child is able to compare and contrast adult sentences to produce the rule governing the formation of such syntactical complexities.

Similarly, Wiig & Semel (1973) have studied the differences between learning-disabled and normally-achieving children's comprehension of logico-grammatical concepts. Testing comprehension of comparative relationships, passive constructions, relationships between sequential events, spatial relationships and familial relationships, Wiig and Semel came to several interesting conclusions. They found that learning-disabled children made significantly more errors than normally-achieving controls. The actual mean differences were 16.66 errors for learning-disabled subjects versus 5.81 for control subjects. The researchers suggested that the performance deficits could reflect abstraction and generalization impairments and attempted to remediate logico-grammatical skills. Their students made significant gains after training. The implication for the possibility of remedial intervention of syntactic skills in learning-disabled children is crucial.

Bartel, Grill and Bartel (1978) attempted to relate the syntactic-paradigmatic shift of normal children to a possible explanation of language deficiency in learning-disabled children. The syntactic paradigmatic shift refers to Brown and Berko's (1960) finding that in word association tasks, young children are more likely to respond with sequentially cued words to Stimulus words (example: S: Red - R: Ball); whereas an older child or adult is more likely to respond with a word sharing the same 'lexical privileges' as the stimulus word (example: S: Red - R: Blue). Bartel et al. found no significant differences between learning-disabled children and normally-achieving children and suggested that perhaps memory and attention problems may account for linguistic anomalies of learning-disabled children. Nevertheless, their finding that the syntactic-paradigmatic shift normally occurs at about age ten provides further support for the theory of syntax development throughout childhood. One last study that bears on this subject was carried out by Palermo and Molfese (1972) who found that syntactic comprehension gains are made until at least thirteen years of age.

Adams (1977) raised the issue of the differences between spoken language and written language. Written language contains none of the 'real-world context'; tone and stress, prosodic and temporal pattern of the speaker that makes spoken language easy to comprehend. The listener relies on non-verbal information to gain understanding of what is said, information that is not available in written language. Syntactic competence in the listener is aided by all of the above-mentioned speaker-patterns. However, written discourse provides no such cues except for punctuation marks. The segregation of phrasal and clausal units are left largely to the reader. The implication is that: "reading presumes a level of syntactic proficiency that is not required for listening" (Adams, 1977). The reader has to discover, or construct syntactic structure in the written material for himself. It is clear that cognitive processes play an important part in his ability to do so. Several studies relate to this subject.

Cohen and Freeman (in press) found that good readers are more sensitive to syntactic structure per se than are poor readers. However, poor readers improve their comprehension of materials if demarcated phrase boundaries are provided (Cromer, 1972). Moreover, Weaver (1977) was able to train syntactic sensitivety in third grade readers by tutoring the solution of 'sentence anagrams'. This skill generalized and increased performance was noted on other tests of reading comprehension. Adams (1977) suggested that syntacticly related reading problems may be more subtle than word recognition problems and thus be more difficult to detect or correct. Wiig, Semel and Crouse (1973) adapted Brown and Berko's (1960) morphology experiment to compare the performance of learning-disabled children, high-risk and normally-achieving children. Berko's experiment required children to generalize morphological rules to nonsense words. The results were interesting. High-risk and learning-disabled children made fewer correct responses than the normally-achieving children. It was concluded that both of these groups were delayed in their acquisition of morphological rules. Because morphological rule acquisition depends on abstraction and generalization ability, Wiig et al. (1973) suggested that failure to acquire these rules may be the result of impairment of these cognitive processes.

Denner (1970) found that problem readers were less competent than average readers in synthesizing non-representational forms into meaningful sentences. Denner based her study on Farnham-Diggory's (1967) four tasks of sententional synthesis abilities: 1) verbal commands, 2) pictograph 3) logograph 4) synthesis of separate logographs. The performance of the learning-disabled group was differentiated only on the last task. Denner suggested that the learning-disabled children were unable to string the separate units together (walk - around - teacher) because of their fixation on the individual words. However, Denner's study has some serious problems. Specifically, no I.Q. measures were indicated for the subjects making sampling error a possibility. In spite of the difficulties with interpreting her study, Denner made a relevant observation when she posited that problem readers lack an appreciation of written language and the rules that govern the relationship of words to words (syntax) independent of the relevance and reference to external reality. Denner's observation appears supported by what is known in the field today as 'metalinguistic' awareness.

In summary, children seem to develop the ability to understand and produce syntactic structures of increasing complexity well into their teen years. Furthermore, several studies provide evidence that syntactic ability is closely related to reading achievement. The direction of the causality is not known. We do know, however, that learning-disabled poor readers seem to lag up to three years behind their normally-achieving peers in their acquisition of syntactic rules. This lag has been shown to continue right into adolescence. If, as several of the studies suggest, syntactic ability is determined by conceptual ability, then effective remediation must depend on establishing an adequate conceptual basis as well as adequate and efficient cognitive and logical processing strategies. This becomes even more evident when we examine the following two categories of linguistic development: semantics and pragmatics.

Semantics

Semantic ability encompasses the comprehension of both oral language (discourse) and written language. There is little empirical evidence demonstrating differential performance in semantics between learning-disabled and normally-achieving children. Extant studies have focused on the interplay between short and long-term memory, verbal and non-verbal mediation and automaticity.

Perfetti and Goldman (1976), in studying the relationship between short-term memory and comprehension, constructed two hypotheses: (1) children who are not skilled in reading comprehension are relatively unskilled in encoding linguistic information in working memory; and (2) reading comprehension difficulty is part of a more general language comprehension difficulty. Research on clause boundaries as related to memory processes carried out by Jarvella (1971) and Jarvella and Herman (1972) formed the basis for their hypotheses. Jarvella (1971) provided evidence that what is recalled from discourse is a function of the locus of the information in the sentence. Sentence boundaries appear to serve as markers for memory functions to reprocess the sentence for long-term storage; thereby, freeing short-term functions to process the next segment of discourse.

Perfetti and Goldman (1976) found differences between their skilled and less skilled readers in short-term encoding of linguistic input. The less skilled readers performed comparably to the skilled group in digit memory and under the clause condition where memory was least taxed. However, under more complex clause conditions, the skilled readers were superior in their ability to hold more than one clause in memory to efficiently answer the recall probe. Perfetti and Goldman suggest that reading comprehension difficulties are language comprehension difficulties specifically related to the short-term memory processing of verbally mediated information.

Several studies cited by Bryan (1978) found differences between disabled and normal readers on naming tasks. Differences were also found in speed of response (Denkla, 1974; Fry, Johnson & Muehl, 1970; Wiig & Semel, 1975). Speed of response is related to the concept of automaticity. It is assumed that a longer response latency implies an inefficiency of recall and it has been further suggested in view of findings cited above, that learning-disabled children have trouble developing automaticity. However, Vellutino (1977) has shown that recall and efficiency of recall is only a problem with learning-disabled children when verbal mediation is involved. Torgesen has investigated this problem (Torgesen & Goldman, 1977) and found that learning-disabled children could be trained to produce memorial strategies and that such children could be trained in verbal rehearsal which would facilitate memory performance.

Adams (1976), in her research into the failure of some readers to comprehend, states that semantic processing of read information depends on two cognitive abilities: (1) the fidelity or completeness with which the reader can map the intended meaning of the textual elements onto his own conceptual structure and (2) the reader's ability to usefully organize the meaning of the passage " (p. 28).

Adams suggests that there are several possible impediments to the successful completion of (1): a) "lack of appreciation of pragmatic dimensions of discourse" b) "differences between dialect and reading material" c) "difficulties in co-ordinating references" d) "difficulties with polysemy, metaphor and figurative language" and e) "difficulties in appropriately altering point of view" (p. 28).

As mentioned above in the syntactic processes section, a child's linguistic sophistication (i.e. vocabulary and syntactic complexity) is intrinsically tied with his conceptual sophistication. Experience, or lack of it, may inhibit understanding and lack of understanding may inhibit experience. This reciprocal relationship is evident when viewing the vocabulary-reading matrix.

Adams' second category of semantic impediment focuses on the organizational ability of the reader. Bransford and Johnsen (1973) suggest that the reader's ability to impose structure on material is crucial to comprehension of read material. Smiley, Oakley, Worthen, Campione and Brown (1977) found that the ability to analyze the relative importance of read units develops with age and that seventh grade poorer readers were as 'insensitive' to degrees of thematic importance as beginning readers. In light of Torgesen's work, an important implication from this study is the possibility of training or inducing learning-disabled children to be sensitive to idea-importance and to organize material meaningfully.

Pragmatics refers to three separate contexts:

1) language in 'text' - written speech that actually is so different from spoken discourse that several authors suggest this difference is the 'cause' of dyslexia and recommend various remedial procedures. I have already discussed this aspect in the syntax section above.

2) language in the social context i.e. oral communication.

3) synbolic language i.e. non-verbal communication.

Elizabeth Bates (1976) wrote: "... the most important reason for studying pragmatics in child language is that it occupies the interface between linguistic, cognitive and social development (p. 3). Bates presents a series of studies of the development of pragmatics and relates this development to Piagetian theory of cognitive growth. She concludes:

> Finally, the epistemological system presented here in a sense establishes pragmatics as the first and primary structure in the ontogenesis of language. Recent psycholinguistic research (e.g., Brown, 1973, Bowerman, 1973) has suggested that syntax might be derived ontogenetically from semantics. We are carrying that suggestion a step farther, proposing that semantics is derived ontogenetically from pragmatics. Austin (1962) notes that "To say something is to do something." Insofar as the content of early utterances is built out of the child's early procedures or action schemes semantics is derived from efforts to do things with words. Language is a powerful and complex tool, an artificial system that is created by the child in the same way that it evolved historically - in an effort to make meaningful things happen (p. 354).

This position is directly in support of Marilyn Edmonds (1976) view that "a satisfactory account of language acquisition will not emerge until this process is viewed within a larger developmental perspective" (p. 175).

This statement can be compared with Mattingly's argument that language (speaking and listening) is a primary process and reading - a secondary process based thereon. It thus becomes clear that the development of reading skill is based on the development of language which, in turn, is predicated on the development of cognition. This has obvious implications for educational research. We have a wealth of examples of children reading and misreading - where we have a dearth of examples of their language sampled to reflect and shed light on their cognitive growth. We have as yet to describe adequately children's language in terms of a given cognitive stage. Linguists are apparently turning to this task (Ingram, 1976). Educators in the filed of learning-disabilities could focus on the differences of learning-disabled children's language from normally-achieving children's language.

Children, when learning language, must acquire not only the ability to know how to use words and grammatical patterns but must also become aware of when and how to say something appropriately. Examples of pragmatics (language in context) include the use of appropriate referrent (I, you, they, him, etc.) (Bates, 1976); the use of appropriate polite forms (Bates, 1976); and the use of appropriate style (Entwisle, 1975).

The latter aspect of pragmatics, that of the use of appropriate style is an interesting area of possible research development. As Bryan (1978) mentioned, if a child does not know how or when to switch language styles (and style includes such factors as pitch, prosodic use, tone as well as vocabulary and syntax), will the listener not, albeit unconsciously, react to this in negative fashion? Consider how important "manners" are to our perception of another person. Giles and Powesland (1975) stated, that when judging a person's attitude, we may quantify information as follows: 7% speech content, 38% vocal qualities and 55% facial expression. Seligman, Tucker and Lambert (1972) demonstrated how important non-content speech cues were for the evaluation of personality in a school situation. They concluded that "speech style was an important cue to the teachers in their evaluation of students. Even when combined with other cues (information on I.Q., scholastic achievement, etc.) its effect did not diminish " (p.3).

Bryan (1978) cited Shatz and Gehlman's (1973) study where it was shown that as early as four years of age, children will modify their speech differently when speaking to younger children (two year olds), adults and peers. Bryan and Pflaum (1978) followed this up in a study using fourth and fifth grade learning-disabled and normally-achieving children. Their findings are important:

> ...learning-disabled children use less complex language than non-disabled children and fail to use less complex linguistic forms and differential content when communicating to younger children. (p. 22)

The interesting questions here are, - Do learning-disabled children not know how to modify their speech according to social context? Are they less aware of "context clues" in the speech of others as well as of their own? Is this awareness an innate trait (or talent perhaps) as Mattingly (1972) suggests, or one that is induced by environmental factors?

Bryan and her colleagues have found that learning-disabled children are less likely to emit positive verbal statements to others and more likely to receive negative (rejection) statements in the classroom environment, (T. Bryan, Wheeler, Felcan and Henek, 1975). The authors related this to the finding that learning-disabled children were less accurate than normally-achieving children in identifying non-verbal information on the Pons test. Bryan suggested that "less accurate understanding of non-verbal communication may be one specific component of social relationships which affect the attitude of others towards learning-disabled children" (p. 1). Further studies showed that (1) learning-disabled children were less likely to be accepted and judged to be adequate by their peers (T. Bryan 1974b, 1976) (2) learning-disabled children spend more time on off-task behavior in the classroom (T. Bryan, 1974a) and that (3) strangers rated learning-disabled children lower on sociometric scales after no prior knowledge of the children and only 1 1/2 - 4 minutes of exposure (J. Bryan, 1978).

T. Bryan postulated that the underlying cause of the three problems listed above is that learning-disabled children are unable to discriminate, select and produce appropriate non-verbal behaviors as well as not being as competent in actual verbal expression (T. Bryan, 1978).

A quote from Lenneberg (1967) places Bryan's finding in a greater cognitive perspective:

> There is evidence... that cognitive function is a more basic and primary process than language, and that the dependence relationship of language upon cognition is incomparably stronger than vice-versa (p. 333).

However, this universal view as expounded by Bates, Edwards and Ingram as well, has limitations. Insofar as cognition is developmentally determined we may view language to follow the same stages in the school years that Piaget suggested cognition does. As stated before more empirical evidence is needed to illustrate this relationship.

Metacognitive and Attitudinal Characteristics of Learning-Disabled Children.

The distinction between metacognition and cognition is the distinction between knowledge and the understanding of knowledge in terms of awareness and appropriate use (Brown, 1980; Wong, in press). The impact of recent developments in metacognition in developmental and cognitive psychology on the Learning-Disabilities field appears in the growing interest in a new conceptualization that views learning-disabled children as engaging in less metacognitive activity than normally-achieving peers in given tasks. There is some empirical support for such a conceptual view (Hallahan, Gajar, Cohen & Tarver, 1978; Torgesen & Goldman, 1978; Wong, 1978, 1979d, 1980).

Judging whether one idea is thematically more important than another is critical to the achievement of comprehension of what is read. Smiley, Oakley, Worthen, Campione and Brown (1977) found that learning-disabled children were very 'insensitive' to gradations of thematic importance. The investigators found that learning-disabled seventh graders performed at a level of grade one normally-achieving children. Furthermore, it appears that learning-disabled children monitor their own comprehension less than normally-achieving readers.

Owings, Petersen, Bransford, Morris and Stein (1980) found that learning-disabled children spent equal amounts of time studying difficult passages as they did studying easy passages. Moreover, they found learning-disabled children did not spontaneously self-monitor their own state of reading comprehension. However, when prompted to identify the difficult and easy passages, they were able to do so.

Wong (in press) investigated the differences between normally-achieving, learning-disabled and gifted readers' use of organized strategies and self-checking behaviors in selecting retrieval cues. She found that learning-disabled children used less efficient strategies in selecting retrieval cues than the gifted children. Moreover, compared to both gifted and average children learning-disabled children lacked self-checking skills.

The research in memory and cognition sheds some light on why learning-disabled children fail to produce strategic behaviors. In his studies of children's development of memorial strategies, Flavell (1972) proposed that young children fail to produce appropriate strategies such as 'verbal-rehearsal' because of production deficiency. Flavell substantiated his proposal with the evidence that young children, when prompted to use verbal-rehearsal strategies, performed better on memorial tasks. He therefore argued against ability deficits as contributors to young children's poor performances in memory tasks.

Torgesen and Goldman (1977) induced learning-disabled children to use memorial strategies that facilitated their performance on memorial tasks. The authors concluded that perhaps learning-disabled children are less strategic or less aware of the need to produce task-appropriate strategies. In short, the learning-disabled children were less metacognitive than their normally-achieving peers.

Hallahan and Kneedler (1979) have summarized a great deal of research on learning-disabled children's 'production deficiency' with a special emphasis on attentional problems of learning-disabled children. In several studies, Hallahan and his co-researchers (Hallahan, in press; Hallahan, Gajar, Cohen & Tarver, 1977) found evidence substantiating the hypothesis that learning-disabled children are deficient in the production of metacognitive strategies rather than having specific ability deficits.

Torgesen (1980) has hypothesized that learning-disabled children's failure to spontaneously produce metacognitive strategies stems from a 'passive' cognitive style. He suggests that learning-disabled children do not actively involve themselves in given tasks. Hence, they are "inactive learners". However, the origin of learning-disabled children's inactivity remains an empirical question (Wong, 1981).

The importance of the learner being 'active' in the learning process is underscored by the substantial research on locus of control. The bulk of this research literature has shown that whether or not learners believe they can affect or control their own learning outcomes, environments, and future, appears to be a good predictor of their academic performance (Gilmor , 1978; Lefcourt, 1976; Phares, 1976). Those with internal locus of control beliefs believe they control their own performance outcomes of success or failure. In contrast, those with external locus of control beliefs believe that an external agent, e.g., fate or luck controls their performance outcomes. Children and adolescents with internal locus of control beliefs were found to have higher grade averages and superior achievement-test performances than those with external locus of control beliefs (McGhee & Crandall, 1968; Messer, 1972; Nowicki & Roundtree, 1971; Nowicki & Segal, 1974). Moreover, Dweck and Repucci (1973) found that sixth graders with internal locus of control beliefs persisted longer in the face of failure than children with external beliefs. The greatest persistence was observed among children with internal beliefs who viewed effort rather than ability as the critical factor in determining performance outcomes of success and failure.

Training students to acquire more internal locus of control tends to increase their achievement substantially (DeCharms, 1972; Matheny & Edwards, 1974). Dweck (1975) also found that training children to take responsibility for failure and to attribute it to lack of effort resulted in unimpaired performance following failure in the criterion task.

Not surprisingly, internal locus of control beliefs were also highly correlated with self-esteem in children, adolescents, and college students, and with self-perceptions of independence (Baldo, Harris and Crandall, 1971; Epstein & Komorita, 1971). Thus, whether or not students assume responsibility for their own learning has an important and pervasive influence on their self-concepts and academic performance.

Since the inception of the present research project, several interesting and relevant studies have been completed (T. Bryan, Pearl & Donahue, n.d.; Ladd, 1979) that bear directly on the conceptualization of the learning-disabled child as an 'inactive' learner.

Using principles in Bandura's (1972) social learning theory of behavioral change, Ladd (1979) trained learning-disabled children in verbal and non-verbal skills which were essential in building and maintaining positive peer relations. His training increased learning-disabled children's social status among their peers. Moreover, this positive change was maintained after four weeks. Two control groups receiving the same amount of attention and no treatment, respectively, evidenced no such change of social status. Clearly, training effectively altered learning-disabled children's verbal and non-verbal social behaviors.

A series of studies concerned with learning-disabled children's linguistic and attitudiaal characteristics by Donahue (n.d.) and T. Bryan, Pearl and Donahue n.d.(a) have demonstrated that learning-disabled children tend to be inactive and more deferential in their social relationships with peers (T. Bryan, et al., n.d.(b)) and more "pessimistic about their ability to influence outcomes of their performance" (T. Bryan, et al., n.d.(a)). The investigators interpreted their findings to suggest that learning-disabled children's external locus of control beliefs might have influenced their conversational behaviors.

Specifically, Donahue, Pearl and T. Bryan (n.d.) found that, in a referential questioning task, learning-disabled children were as perceptive of the adequacy of verbal messages as normally-achieving children. However, the learning-disabled children were less likely to request more information to complete a task as were normally-achieving children of the same age. However, the language used by the learning-disabled children was syntactically as complex as that used by the normally-achieving children. The investigator pointed out that learning-disabled children's perception of their own inferior academic status influenced their approach to the communication tasks in the experimental situation with an unfamiliar adult.

Donahue (n.d.) found that learning-disabled children used as syntactically/semantically complex speech as normally-achieving children when formulating requests of listeners. Although the learning-disabled requests were as polite as normally-achieving children, they used polite forms differently than normally-achieving children. Indeed, learning-disabled girls used extremely polite forms to peers whereas normally-achieving girls did not.

It appears that learning-disabled children behave differently than normally-achieving children in the communication process but the origin of the difference of learning-disabled children's socio-linguistic interaction with others remains to be researched. Perhaps their communication patterns are related to their self-concept or their perceptions of control over outcomes (locus of control beliefs) or to their experiences of repeated failure in academic and social areas alike.

In consideration of these unanswered questions, a fruitful direction of research would certainly be to investigate further linguistic and socio-linguistic competences of learning-disabled children.

Conceivably, learning-disabled children may not be deficient in linguistic processing per se (for example, understanding the adequacy of a communication) but rather, their communication deficiencies may reflect a lack of <u>active</u> involvement in the communication process. Perhaps learning-disabled children are unaware of their social responsibilities or obligations in conversational interaction.

III. METHOD

Subjects

The sample consisted of 45 middle-class suburban grade-five school children randomly selected from eight schools in Burnaby and Surrey, British Columbia, Canada. Selection criteria, general and specific, were as follows:

General Selection Criteria

Age. All subjects were between the ages of 10 years, 0 months and 11 years, 8 months (Mean Age: 11 years, one month; S.D.: three months). The reasons for selecting this age range were: (1) Each child would have had at least four years of reading instruction; (2) average or below average reading ability would be more discernible than at an earlier grade; (3) the emotional concomitants of reading failure would not be as severe as at a later grade; and (4) the age range of the present subjects correspond to that of subjects in Bryan and Pflaum's (1978) study upon which this study is partially based.

Intelligence. To confirm that the children participating in this study were all of average or above intelligence, the Peabody Picture Vocabulary Test (Dunn, L. and Markwardt, F., 1965)was administered to obtain an I.Q. score. As the school boards involved in the study discouraged lengthy intelligence testing, I used the P.P.V.T. which has been widely used in Canada to obtain indications of children's verbal intelligence. The mean score for the normally-achieving group was 105.8 (S.D. 8.92) and for the learning-disabled group 100.0 (S.D. 9.94).

Other Criteria. As there are several different ethnic populations in the area where the study was conducted, it was necessary to control for the effects of bilingualism on reading and oral language by excluding children from the study whose records indicated that a language other than English was spoken in the home. Children were excluded, also, if their records indicated poor physical health, uncorrected sensory problems (e.g. deafness) or a history of abnormal language acquisition.

Specific Selection Criteria

Normally-achieving children. This group consisted of 15 students, all of whom conformed to the general criteria and all of whom were reading at the grade five level as determined by teacher identification and recent scores on the Canadian Test of Basic Skills(C.T.B.S.; Hieronymus, 1976).
The CTBS was used to obtain a reading grade equivalent score for all the subjects. This test had been recently administered to the subjects through a district-wide testing procedure, and test scores were at most three months old at the commencement of data-gathering. The CTBS is widely used in Canada as a means for establishing group and individual competencies in basic skills. The school boards in this study encouraged the use of these scores as means for identifying those students reading below their grade level.
The minimum grade equivalent score for the normally-achieving group was 5.0. The mean was 5.86 (S.D. 0.77).

Learning-disabled children. The 30 children in this group met the general criteria but were found to be reading one or more years below the grade five level as determined by teacher identification and recent reading scores on the CTBS. Furthermore, these children were receiving learning assistance for reading skills. Mean grade equivalent score in reading for this group was 3.79 (S.D. = 0.63).

Although learning-disabled children are defined as having cognitive processing problems, standardized tests have not yet been developed that would adequately identify these children on that basis. Therefore, in this study, I have followed the method commonly accepted in the research field of identifying learning-disabled children by selecting those children whose achievement does not correspond to their potential as indicated by their I.Q. scores.

Selection Procedure

Subjects. Initially, a pool of potential subjects was formed by requesting grade five teachers to list their students in terms of three groups whose reading ability was above grade level, at grade level or below grade level. Teachers were also asked to identify those students receiving learning assistance for reading problems. Teacher identification was confirmed by consultation with the school psychologist and/or principal with respect to CTBS scores.

From the pool of subjects who met the general and specific criteria, two to four students for the normally-achieving group and four to seven students for the learning-disabled group were randomly chosen from each school.

In addition to the 45 subjects, 105 grade five and 105 grade one children were randomly selected from the class registers to comprise the pool of partners. The only concern in selection was their age range. Grade five children were chosen as peer partners. Grade one children were chosen as the younger partners because the age difference was wide enough so that the younger partners would not be considered peers by the subjects. No other criteria were specified for the selection of partners since they only served as an audience for subjects.

Stimuli

Two board-games were chosen primarily to avoid the problem that Bryan and Pflaum had in their (1978) study, that the game itself was so noisy as to interfere with the exact transcriptions of the tapes; and secondarily, because of the novelty of these games to grade five and grade one children in the Vancouver area.

Teaching game #1: Mancala

Mancala is a folk game said to have originated in Africa, although several versions of the game exist in the world. Interestingly, only one potential subject, whose family was from the Philipines, was familiar with the game and was, therefore, excluded from the study. None of the partners had seen or played the game before. The game, itself, consists of a wooden board approximately 12" x 8" with six pits along both long sides of the board and two large pits in the center of the board. Each player starts out with two pegs or stones in each pit. The object of the game is to get as many pegs into one's own large pit or cala. The rules of the game were slightly simplified so that a younger child could easily learn how to play it and fewer pegs were used in the playing to cut down on the time to complete a game. The game, with these rules, takes approximately five minutes to teach and play. For each subject, three minutes from the instruction and playing were included in the transcript analysis. A complete set of rules is included in Appendix I.

Teaching Game #2: Helix

Helix is a three-dimensional version of tic-tac-toe. The object of the game is clear, the rules are simple to grasp and the conclusion and scoring of the game is readily learned. Specific rules of Helix are presented in Appendix II. This game also took about five minutes to teach and play.

Procedure

Fifteen grade five children formed the normally-achieving group. From the 30 learning-disabled children, 15 were selected at random to receive training in the use of pragmatic strategies in Part B of the study. The remaining 15 learning-disabled children received no training.

All grade five and grade one children in each school were asked to return from home signed participation consent forms. Only children whose parents consented were allowed to participate in the study as either subjects or as partners. Data gathering was completed in one school prior to moving on to the next school in order to eliminate the learning of the game by other classmates before they were to participate in the experiment. The participating classes were informed that I was carrying out research on games for children and would appreciate their help. Teachers were, however, informed of the purpose and method of the research project and were encouraged to ask for more information if they were interested.

Data-gathering procedure

Part A. In Part A of the study, each subject was asked to come with me to a secluded area in the school, usually an unused classroom or nurse's office. Here, I familiarized the child with the situation and attempted to create a relaxed atmosphere. The PPVT was then administered. This took about 10 minutes. Subsequently, I explained to the child that s/he would be learning a new game and that s/he would have to teach the game, first to a peer and then to a first-grader. I, then, proceeded to teach Mancala to the child, after which the child practiced teaching Mancala to me. The exact pretest procedure of teaching the Mancala game to the children is fully explained in Appendix III.

When the child demonstrated satisfactorily that s/he knew how to play the game, the peer partner was brought from the classroom.

Peers were randomly selected from those children not included as subjects and who had parental consent to participate. The peer was told that s/he was going to learn a new game from a classmate. As subject and peer knew each other, no time was spent in acquainting them with each other. The children were told that they were going to be tape-recorded; none objected and none seemed unduly apprehensive about this aspect of the situation. The subject was told to begin teaching the game. I remained in the room during all sessions. When the child had taught the game and the playing of it was completed, the peer was thanked and asked to return to the classroom. I then asked the subject five questions concerning the teaching of the game and recorded his/her responses on a questionnaire (see Appendix IV).

A first-grader was then brought to the room and told that s/he was going to learn a new game. The procedure was the same as that used with peers. After the game was completed, the first-grader returned to class and the same questionnaire was administered again to the subject. All pretest sessions followed the same routine and usually lasted between 30 and 40 minutes.

Part B. In Part B of the study, learning-disabled groups received different treatments. The trained group received the training program as outlined below for three days for 30 minutes each day. The non-trained learning-disabled group received equal exposure to me and the Mancala game by engaging in an irrelevant task, where they were asked to help design better games by drawing plans of the Mancala game on different coloured pieces of paper for 30 minutes each session for three days.

Training. The overall purpose of the training program was to make learning-disabled children more aware of the pragmatic constraints of the communication process. To accomplish this, learning-disabled subjects were trained to use planful strategic behavior in the game-instruction situation. The training occurred over three successive days in 30-minute sessions each day on an individual basis. The criteria for successful completion of the training program was demonstration of use of planful strategies by the subject without my support. Three main strategies of planfulness were focused upon in the training sessions:

1) Main Ideation: This was operationally defined as the main components of the game through identification and labeling of the main ideas: Introduction; Object of the game; Start; Rules and Finish.

2) Subordinate Ideation: This strategy was comprised of the explicit inclusion of subordinate components of the game. For example: how to set up the board; the specific rules; the scoring system.

3) Sequencing: Sequencing was the strategy of presenting information or components in a meaningful order.

The training program used principles of modeling, reinforcement and feedback techniques. I also incorporated into the training program Kestner and Borkowski's (1977) suggestion of emphasizing the general utility and value of strategic behavior (i.e., planfulness, in this study) in the beginning and at the end of each training session to increase the possibility of generalization effects.

The three training sessions were designed to train the children to be planful and organized when teaching another child a game. This was accomplished by training them to think about their instructions in terms of how planful they were. Each session commenced with a discussion of the general utility and value of planfulness and ended with a discussion of how planful the children had been during the particular session. The children were prompted to evaluate their own performance. During the first session, the experimenter modeled the teaching of the game. The following sessions included practice on the part of the child in teaching the game and a discussion of what comprises strategies of planfulness in teaching games to others. An outline of the daily program of training is presented in Appendix V.

Posttest. The posttest procedure was the same as the pretest procedure. Both of the learning-disabled groups were asked to teach Mancala to a peer and a first-grader. In each session, a different peer and younger partner was used. After each session, the interview questions were repeated to the subjects and their responses recorded on the questionnaire. The posttest sessions usually lasted 20-30 minutes.

Maintenance. After an interval of four days, the learning-disabled trained group was asked again to teach Mancala to a peer and a first-grader to determine the maintenance effects of training on learned skills.

Generalization. In order to determine the effects of training on generalization of learned skills, the learning-disabled trained group was taught how to play a new game, Helix, after the maintenance check. They were then asked to teach this game to a peer and first-grader. The procedure of the maintenance and generalization checks were the same as with the previous pretest and posttest procedure. These sessions usually lasted about 30 minutes.

Transcription

When all data-gathering was complete, the audio tapes were transcribed by a professional typist using a dictaphone transcriber. The transcripts were analyzed according to the dependent measures by me and two assistants, both of whom were graduate students in education. The questionnaire responses were also scored and coded by me and the assistants.

Dependent Variables

This study is designed to accomplish three main purposes. One purpose is to replicate the findings of Bryan and Pflaum (1978) that learning-disabled children use less complex language than normally-achieving peers. The second purpose is to extend the study to include the examination of pragmatic awareness, pragmatic strategy use, locus of control beliefs and accuracy of self-evaluation of learning-disabled children. The final purpose is to investigate the effects of training learning-disabled children to use pragmatic strategies on the six characteristics mentioned above. Thus, the dependent variables are: linguistic complexity; pragmatic awareness including a) modification of language b) use of planfulness strategies c) awareness of pragmatic parameters of the task; accuracy of self-evaluation of performance and locus of control belief characteristics. The measurement of each dependent variable will be described below.

Linguistic Complexity

Because the first purpose of this study is to replicate the findings of Bryan and Pflaum's (1978) study, the same method of scoring language samples was used. The linguistic analyses included a count of the total number of words used; the number of words excluded for the reason of being repetitious or nonmeaningful; the number of words in t-units; the number of t-units and the total number of complexities in eleven categories. Examples of the complexity categories are passives, adverbs, prepositional phrases, subordinate clauses and infinitives. A total of 26 linguistic variables were analyzed. However, as six of these were under the category of words excluded; and two were both counts of clauses; only 19 will be discussed in the report of the data. A list of all 26 linguistic variables is presented in Table 1.

Table 1

Twenty-six Linguistic Variables Analyzed in the Study

1. Total number of words
2. Number of words in t-units
3. Number of words excluded:
    4. Introductory phrases *
    5. Mazes *
    6. False Starts *
    7. Audible pauses *
    8. Repeated phrases *
    9. Incomplete clauses *
10. Number of t-units
11. Number of complex t-units
12. Total number of clauses in complex t-units *
13. Total number of clauses
14. Passives
15. Nominalizations
16. Appositives
17. Adverbs
18. Adjectives
19. Prepositional phrases
20. Infinitives
21. Tag questions
22. Deleted thats

23. Other deletions
24. Total number of complexities
25. Ratio of linguistic complexities per t-unit
26. Mean length of utterance

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* These variables were excluded from the discussion of the results due to their repetiveness.

A ratio of linguistic complexity was calculated for each game instruction session by dividing the total number of linguistic complexities by the total number of t-units.

$$\text{Ratio of complexity} = \frac{\text{Total number of complexities}}{\text{Total number of t-units}}$$

This ratio reflects the linguistic sophistication or complexity of a speaker as calculated over a segment of speech.

The scoring procedure is included in its complete form in Appendix VI. The only modification of Bryan and Pflaum's scoring procedure was clerical simplification: one sheet was used for the transcript instead of one sheet for each separate t-unit.

From each subject's transcript, three minutes of communication were analyzed for linguistic complexity. This length of time allowed for an entire explanation of the game as well as at least one minute of actual playing time for most children. Only a few children took more than two minutes to explain the game to the other child. The actual instruction-time lengths have been included in the analysis of results.

Reliability

Attempts were made to train graduate students in the scoring of linguistic complexity. However, none felt confident at their ability to adequately judge grammatical categories. It was, therefore, decided that reliability would be established by having me re-score 15 of the 45 subjects' protocols after a delay of two months from the initial scoring.

Five protocols were randomly chosen from the three groups of subjects and I re-scored all linguistic variables. As the total number of linguistic complexities score includes a count of the total number of clauses and, therefore, a count of the total number of t-units, this score was used to compute reliability between the two sets of scores. Correlation co-efficients are reported in the Results section.

Pragmatic Awareness

Pragmatic awareness is the consciousness of the socio-linguistic constraints of the communication process. A speaker must be metacognitively aware of his audience, his message and his intent among other factors in order to communicate effectively. Three dimensions of pragmatic awareness were measured in the contexts of speaker to peer and speaker to younger child (first-grader) dyads. These three dimensions include overt-performance or behavioral dimensions as well as a covert or intuitive dimension. The overt dimensions of modification of language according to age of audience and use of strategic behaviors of planfulness were measured through examination of the dyad-transcripts. The covert dimension of the children's awareness of the pragmatic paramaters of the task was measured by scoring their responses to a questionnaire which included self-evaluation of their performance. An indication of their locus of control beliefs was, likewise, derived from responses to the questionnaire. Measurement of these five dependent variables is explained below.

Linguistic Modification

Linguistic modification refers to the degree of adjustment that a speaker makes in his language in consideration of the age level of his audience. Children as young as four years of age will adjust the linguistic complexity level of their speech when speaking to younger children (Schatz & Gelman, 1973). Modification of language was analyzed by comparing the ratio of linguistic complexity of the subject to peer-partner dyad with the ratio of the subject to younger-partner dyad in an analysis of variance.

Use of Planfulness Strategies

In order to communicate effectively, a speaker must be sufficiently organized or planful in the way s/he presents information, especially if the audience is to be able to perform a task as a consequence of the communication. When teaching someone else a game, presenting details under organized main idea labels and in a meaningful sequence will greatly facilitate the learning of that game by the other person. Therefore, three linguistic behaviors that were considered to contribute to planfulness in the game instruction task were scored separately from the transcripts. These were: (a) main ideation (b) subordinate ideation and (c) sequencing. See Appendix VII for complete scoring procedures.

(a) Main ideation is the communication of main ideas. Transcripts were scored for how well instructions were organized into meaningful parts. This organization was considered to be the statement or labelling of the main ideas. The main ideas in the game instruction were Introduction, Object of the Game, Starting, the Rules and Finishing. Subjects were given two points for each time they stated one of these five main ideas. If the subject used less precise terminology one point was given. 0 points were given for no mention of the main ideas.

For example, the object of the game is ... (2 points)

the big deal of this game is ... (1 point)

Total number of points possible was 10.

(b) Subordinate ideation is the inclusion of subordinate detail. When teaching someone how to play a game, enough of the subordinate detail must be conveyed to make the playing of it meaningful. Therefore, one point was scored each time a subject stated specifically a subordinate detail of the game proceedings. There were 15 subordinate details in the Mancala and Helix games.

For example: "You have to move from left to right." (1 point)

"We each start out with 2 pegs." (1 point)

(c) Sequencing. While instructing someone else to play a game, a certain sequence of giving information is more meaningful and efficacious than others. It obviously makes sense to explain how one starts before explaining how one finishes the game. Therefore, an optimum order was established in the sequence of the subordinate detail. Each subject's transcript was compared to this order and given a score according to the following method:

Using the score given under (b) one point was subtracted from this score each time the subject's order deviated from the optimum order.

For example: One subject presented nine subordinate details in this order:

O (object)

I (introductory)

S (starting)

R (rule)

R (rule

F (finishing) - subtract one point
S (starting) - subtract one point

R (rule)

F (finishing)

---

7 points

Two of the subordinate details mentioned by this subject were scored as being in a non-meaningful sequence and one point was deducted for each from the total nine establishing a score of seven for sequencing.

Reliability

Reliability of the scores was established by having another graduate student first read the scoring procedure as presented in Appendix VII. She then scored independently five transcripts to familiarize herself with the procedure. I answered any queries at this point. The rater then re-scored five random protocols from each of the three groups of subjects. Reliability correlations were computed by comparing the total number of points given for planfulness on each of the transcripts by each of us. The correlations are reported in the Results section.

Subject Awareness of the Pragmatic Paramaters of the Task

The questionnaire presented in Appendix IV was designed to reveal if the participating children were able to express spontaneously awareness of linguistic strategies of planfulness and modification and evaluate their own performance in terms of their use of strategic behavior. After each session, the questionnaire was administered to the subjects. Their answers were scored according to the degree of awareness of strategic behavior that was expressed. Maximum points were given for responses indicating an awareness of the use of strategic behavior of planfulness or modification. Less explicit responses were given fewer points. Answers giving no indication of 'metacognitive' activity were scored as 0.

For example: Question #3: What do you think you could say or do to help someone learn the game better?

Response #1: Well, I would tell him the object of the game and all the rules. (2 points)

#2: I would remember to tell him about the rule if you get one in the big pit that you get an extra turn (1 point)

#3: Don't know. (0 point)

Complete scoring procedures will be found in Appendix VIII.

Reliability

To measure the reliability of these scores, a graduate student was asked to re-score the questionnaires from 15 protocols (five from each group of subjects) according to the procedures outlined in Appendix VIII. Reliability correlations were calculated by comparing the two sets of scores given by myself and the graduate assistant. Correlations are reported in the Results section.

Self-evaluation of Performance

In this measure, subjects were simply asked to rate their own performance on a five point scale ranging from very well on one end to very poorly on the other. The scale was converted to numerical equivalents during the scoring procedure; e.g. very good = 5 points, very poor = 1 point. Complete scoring procedure will be found in Appendix IX. Accuracy of self-evaluation was measured by correlating the subject's own rating of his/her performance with the score received for use of pragmatic strategies.

Locus of Control Belief

Subjects' responses to Question #3 on the questionnaire (see Appendix IV) were judged as to whether or not they reflected external or internal locus of control beliefs. The responses included in this measure were those concerning the question of why a subject thought he had taught the game well or poorly. The responses were coded as 1 for internal locus of control belief or 2 for external locus of control belief (see Appendix X).

For example: Question: Why do you think that you taught the game very well?

Response: Because she won me. (External - 2)

Response: Because I remembered to tell her all the rules and the object of the game, too. (Internal - 1)

Reliability

The graduate student assistant proceeded in the same manner as for the pragmatic awareness variable. Correlations of the two sets of scores are reported in the Results section.

IV. RESULTS AND DISCUSSION

The results of this study are reported and discussed in terms of its two parts: Part A being the comparison between learning-disabled and normally-achieving children's language, linguistic modification, pragmatic awareness, pragmatic strategy use, locus of control belief and accuracy of self-evaluation. Part B comprises the analyses of the effects of training learning-disabled children to use pragmatic strategies.

To facilitate reading of the results, I report here only those statistically reliable effects which pertain to the hypotheses of the study. For further reference, descriptive statistics and results of analyses of variance for all variables are presented in Appendix X. Reliability analyses are included in the discussion of each dependent measure.

Part A

Two (Groups) x 2 (Partners) factorial analyses of variance with repeated measures on the partners factor were used to analyze the data and test the six hypotheses of Part A of the study. The analyses confirmed the hypotheses that learning-disabled children were less aware of the pragmatic constraints of the communication process and used fewer pragmatic strategies than their normally-achieving peers. However, the data did not support the hypothesis that learning-disabled children used less complex language than normally-achieving children when communicating with a partner. Neither did the analyses support the hypothesis that learning-disabled children modify their language less than normally-achieving children when communicating with a younger audience. Moreover, results indicated that learning-disabled children expressed as many internal locus of control statements as the normally-achieving children when evaluating their own performance. Finally, contrary to the hypothesis, neither the learning-disabled children nor the normally-achieving children were accurate when evaluating their own performances. The results will now be reported and discussed in detail according to the hypotheses.

Linguistic Complexity

The data did not substantiate the hypothesis that learning-disabled children use less complex language than normally-achieving peers. The two groups did not differ on the total number of complexities used per t-unit. However, reliable main effects were found for three of the complexity variables: adjectives: [$F(1,43)= 5.8899$; $p < .05$]; prepositional phrases: [$F(1,43)= 4.4106$; $p < .05$]; and tag questions: [$F(1,43)= 11.7683$; $p < .01$]. Table 2 presents the groups' means for these three complexity variables. The normally-achieving group used more adjectives, prepositional phrases and tag questions when communicating with a partner than did the learning-disabled group. It is possible that use of adjectives and prepositional phrases are more subtle indicators of normally-achieving children's superior linguistic ability than is the ratio of linguistic complexities per t-unit. However, that conclusion remains tentative as no reliable differences were found on complexities of equal linguistic sophistication such as adverbs and deletions. Tag questions were of the nature of 'you know?' or 'get it?' questions at the end of a phrase. In other words, most tag questions are of the feedback-eliciting type. That normally-achieving children used more of these conforms to research on learning-disabled children's referential questioning habits. Learning-disabled children have been shown to be less likely to ask for more information (Bryan, Pearl & Donahue, 1980) and to provide less social feedback to their peers (Ladd, 1980). Therefore, using fewer tag questions may reflect another form of being less active in the communication process. However, in general, the results indicated that the learning-disabled children used as complex language as the normally-achieving children when teaching a game to a same-aged and younger partner.

Table 2

Learning-disabled and Normally-achieving Children's Performance Means on Three Linguistic Variables with Peer and Younger Partners.[a]

Variable	n	Peer M	Peer (S.D.)	Younger M	Younger (S.D.)	Total M	Total (S.D.)
Adjectives							
Learning-Disabled	30	20.733	(7.887)	21.367	(9.463)	21.050	(8.642)
Normally-Achieving	15	24.667	(10.735)	28.533	(8.459)	26.600	(9.697)
Total		22.044	(9.010)	23.756	(9.668)		
Prepositional Phrases							
Learning-Disabled		12.367	(6.505)	15.567	(7.851)	13.967	(7.328)
Normally-Achieving		17.533	(7.415)	19.400	(8.331)	18.467	(7.807)
Total		14.089	(7.173)	16.844	(8.127)		
Tag Questions							
Learning-Disabled		0.867	(1.916)	1.267	(1.929)	1.067	(1.604)
Normally-Achieving		2.333	(2.059)	2.733	(1.870)	2.533	(1.943)
Total		1.356	(1.667)	1.756	(2.013)		

[a] Only three of the 11 linguistic complexity variables yielded reliable differences between groups.

This study did not replicate the findings of Bryan and Pflaum (1978). Possible reasons for this may arise from several differences between their study and mine. In my study, participating children were all from grade five. Bryan and Pflaum included in their study children from grades three, four and five. It is possible that by grade five, children with difficulties in the acquisition of reading skills, have developed oral linguistic skills equal to their peers. It is also possible that Bryan and Pflaum's study included children with more severe reading problems than did mine.

Finally, a difference between the studies that may possibly account for the different results is that of the ethnic background of the children. There were no black children in my study whereas Bryan and Pflaum's included a number of black children. Although Bryan and Pflaum state that their linguistic scoring system does not penalize the children using black dialect, it is possible that differences between black dialect and standard english users have more subtle cognitive effects on language use than is measured by the ratio of linguistic complexity score.

Linguistic Modification

To test the second hypothesis that learning-disabled children modify their language less to younger children than normally-achieving peers, I looked for Groups x Partners interaction effect in the 2 (Groups) x 2 (Partners) factorial analysis of variance used to test the first hypothesis. No statistically reliable interactions were found. Thus, it appears that the learning-disabled and normally-achieving children modified their language equally when communicating with the younger partner.

Both learning-disabled and normally-achieving children used more words, more t-units and more complexities when communicating with the younger partner. In total, six of the 19 linguistic variables analyzed yielded reliable main effects for the partner factor: total number of words: [$F(1,43)= 6.8069$; $p < .01$]; words in t-units: [$F(1,43)= 6.9844$; $p < .01$]; t-units: [$F(1,43)= 6.0659$; $p < .01$]; total number of complexities:[$F(1,43)= 7.2007$; $p < .01$]; adverbs: [$F(1,43)= 6.4793$; $p < .05$] ; and clauses: [$F(1,43)= 5.3931$; $p < .05$]. The group means are presented in Table 3. It is apparent that the younger partner elicited more words, complexities and t-units than did the peer partner, from both the learning-disabled and normally-achieving children. Interestingly, the ratio of linguistic complexities did not yield any reliable differences between partners (cf. Table 1). Despite the increase in amount of speech to the younger partner, the level of linguistic complexity remained stable. This finding was contrary to the second hypothesis that normally-achieving children modify the complexity of their language to a younger child.

Table 3

Performance Means of Learning-Disabled and Normally-Achieving Children on Six Linguistic Variables with Peer and Younger Partners.[a]

Variable	Peer M	Peer (S.D.)	Younger M	Younger (S.D.)	Total M	Total (S.D.)
Total No. of Words						
Learning-Disabled	271.433	(81.632)	307.733	(107.266)	289.567	(92.256)
Normally-Achieving	306.600	(84.125)	330.733	(111.189)	319.667	(97.527)
Total	283.822	(83.413)	315.378	(107.879)		
Words in T-Units						
Learning-Disabled	224.200	(73.293)	256.000	(89.070)	240.100	(82.444)
Normally-Achieving	263.467	(68.928)	287.200	(94.233)	275.333	(82.124)
Total	237.289	(73.503)	266.400	(91.036)		
T-Units						
Learning-Disabled	33.533	(12.921)	38.500	(14.282)	36.017	(13.733)
Normally-Achieving	36.933	(12.349)	40.267	(15.908)	38.600	(14.095)
Total	34.667	(12.696)	39.089	(14.686)		
Total No. of Complexities						
Learning-Disabled	107.767	(33.874)	123.700	(44.291)	115.733	(39.910)
Normally-Achieving	123.933	(37.088)	138.867	(43.480)	131.400	(40.428)
Total	113.156	(35.402)	128.756	(44.122)		
Adverbs						
Learning-Disabled	23.433	(10.411)	27.867	(14.127)	25.600	(12.505)
Normally-Achieving	23.600	(12.597)	28.867	(16.181)	26.233	(14.498)
Total	23.489	(11.043)	28.200	(14.665)		

Total No. of Clauses						
Learning-Disabled	40.933	(15.240)	45.633	(16.209)	43.286	(15.777)
Normally-Achieving	45.000	(12.928)	48.933	(17.579)	46.967	(15.260)
Total	42.289	(14.492)	46.733	(16.532)		

[a] Only six of the 19 linguistic variables yielded reliable main effects for Partners.

Pragmatic Awareness

Pragmatic awareness of learning-disabled and normally-achieving children was measured by scoring the children's responses to an interview questionnaire. The children were given points according to their articulated awareness of pragmatic strategy use in teaching someone else a game (see Appendix VIII for the scoring procedure). Pragmatic strategy awareness included awareness of modification of one's language to a younger child and of the strategy of being planful or organized when instructing someone else to play a game.

A graduate student re-scored 15 of the subjects' responses to the questionnaire. The correlation between her scores and those of the first scorer was .61.

The same factorial analysis of variance design that was used for the linguistic data was also used to analyze these data and test the hypothesis that learning-disabled children are less aware of pragmatic strategies than are normally-achieving children. Because of the low correlation between raters' scores, a cautious interpretation of the results is warranted. However, the results indicate that learning-disabled children articulated less pragmatic awareness than did the normally-achieving children: [$F(1,43) = 5.3805$; p .05].

Table 4 presents the groups' means for this variable. There were no statistically reliable main effects for partners nor were there any reliable interactions.

Table 4

Mean Percentage Scores on Pragmatic Strategy Awareness of Learning-Disabled and Normally-Achieving Children with Peer and Younger Partners.[a]

	Peer		Younger		Total	
	M	(S.D.)	M	(S.D.)	M	(S.D.)
Learning-Disabled	32.600	(14.166)	29.533	(10.234)	31.067	(12.349)
Normally-Achieving	39.600	(13.567)	38.400	(12.659)	39.000	(12.892)
Total	34.933	(14.202)	32.489	(11.743)		

[a] Learning-disabled group: n = 30; Normally-achieving group: n = 15.

Use of Pragmatic Strategies

The fourth hypothesis in Part A is that learning-disabled children use fewer pragmatic strategies of planfulness than normally-achieving children when instructing another child how to play a new game. To test this hypothesis, the children's instructions were scored according to how many strategies of planfulness they used (see Appendix VII for the scoring procedure). Three kinds of planfulness were measured: stating the main ideas of the game (main ideation); including subordinate detail (subordinate ideation) and sequencing information in a meaningful order (sequencing). The three scores from the sub-variables were totalled to form the 'total number of strategies' variable. To obtain reliability of the scores, another graduate student re-scored 15 of the subjects' entire protocols for planfulness. The correlation between her scores and those of the first scorer was .92.

The analyses of the data confirmed the hypothesis that learning-disabled children used fewer pragmatic strategies of planfulness than normally-achieving peers. The variable of interest, total number of strategic behaviors, yielded a reliable main effect for groups [$F(1,42) = 7.8544$; $p < .01$]. The groups' means for the total number of planfulness strategies and for the sub-variables are presented in Table 5. Table 5 shows that the normally-achieving group used more strategies in total than did the learning-disabled group. When the three sub-variables are examined, it can be seen that the normally-achieving group used more subordinate ideation strategies: [$F(1,42) = 6.9306$; $p < .01$], and more sequencing strategies: [$F(1,42) = 6.4287$; $p < .01$], than did the learning-disabled children. Both the learning-disabled and the normally-achieving children used few main ideation strategies. However, the difference in performance here between the two groups was not reliable.

The findings indicate that learning-disabled children seem to be less organized when presenting information to another child about a game (sequencing). Furthermore, they include fewer subordinate details than normally-achieving children. It should be noted at this point that all of the learning-disabled children demonstrated that they knew the subordinate details by playing the game correctly. Their failure to include as many details in their instructions of the game as the normally-achieving children may be because they do not spontaneously monitor their own performance as do the normally-achieving children. Perhaps, learning-disabled children are less likely to ask themselves questions such as "Have I told him all that I know about the game?". The results of the third hypothesis, that learning-disabled children are less pragmatically aware of the socio-linguistic process is relevant to the fourth hypothesis, that learning-disabled children use fewer strategies than normally-achieving children. Thus, it is proposed that learning-disabled children's lack of pragmatic awareness is behaviorally demonstrated when they fail to use pragmatic strategies. While this study did not specifically investigate the kinds of questions that children pose to themselves during a socio-linguistic task, the question of whether training learning-disabled children to monitor and use strategic behaviors would increase their use of pragmatic strategies is the focus of Part B of the study.

Table 5

Pragmatic Strategic Behavior of Learning-Disabled (n = 30) and Normally-Achieving (n = 15) Children with Peer and Younger Partners.

	Peer		Younger		Total	
	M	(S.D.)	M	(S.D.)	M	(S.D.)
Total No. of Strategic Behaviors						
Learning-Disabled	14.567	(3.803)	14.233	(4.987)	14.400	(4.400)
Normally-Achieving	18.133	(4.470)	17.600	(4.372)	17.867	(4.353)
Total	15.756	(4.334)	15.356	(5.005)		
Main Ideation						
Learning-Disabled	1.733	(1.285)	1.433	(1.455)	1.583	(1.369)
Normally-Achieving	2.467	(1.885)	2.400	(1.920)	2.433	(1.870)
Total	1.978	(1.530)	1.756	(1.667)		
Subordinate Ideation						
Learning-Disabled	7.033	(1.712)	6.867	(2.270)	6.950	(1.995)
Normally-Achieving	8.467	(1.885)	8.133	(2.100)	8.300	(1.968)
Total	7.511	(1.878)	7.289	(2.273)		

	Peer M	Peer (S.D.)	Younger M	Younger (S.D.)	Total M	Total (S.D.)
Sequencing						
Learning-Disabled	5.800	(1.789)	5.900	(1.807)	5.850	(1.783)
Normally-Achieving	7.067	(1.870)	7.067	(1.870)	7.067	(1.837)
Total	6.222	(1.894)	6.289	(1.890)		

Locus of Control

The fifth hypothesis of Part A proposes that learning-disabled children respond with more external locus of control type statements than normally-achieving peers when evaluating their own performance. The data did not support this hypothesis. Group means are presented in Table 6. There were no main effects for groups nor partners factors; nor were there any statistically reliable interactions for this variable.

Table 6

Internal and External Locus of Control of Statements of Learning-Disabled and Normally Achieving Children.[a b]

	Peer Partner		Younger Partner		Total	
	M	(S.D.)	M	(S.D.)	M	(S.D.)
Learning-Disabled	1.733	(0.450)	1.600	(0.498)	1.667	(0.475)
Normally-Achieving	1.400	(0.507)	1.533	(0.516)	1.467	(0.507)
Total	1.622	(0.490)	1.578	(2.273)		

[a] The scores reflect a mean point between 1 = Internal and 2 = External.
[b] There were no reliable differences found between these scores.

Both learning-disabled and normally-achieving children responded with more external locus of control type statements than internal type statements when answering the question of why they thought they had taught the game really well (or really poorly, as the case was). That is, both groups tended to view the success of their teaching performance as being related to external factors. As internality for success may be different from internality for failure (Gilmor, 1978), the question was posed whether type of response was correlated with the subjects' rating of their own performance. However, there were no statistically reliable correlations between these two variables. It is possible that internal and external locus of control is difficult to judge from one statement of self-evaluation. The effect of training of pragmatic strategies on locus of control is examined in Part B.

Accuracy of Self-Evaluation

The final hypothesis of Part A of the study proposed that learning-disabled children are less accurate when evaluating the success of their performance than normally-achieving peers. To test this hypothesis, correlations between self-rating and experimenter-rating were compared between the learning-disabled and normally-achieving groups. Correlations are presented in Table 7.

Table 7

Correlations Between Self-Rating and Experimenter Rating of Performance of Learning-Disabled and Normally-Achieving Group.

	Peer	Younger
Learning-Disabled	-0.1410	-0.2355
Normally-Achieving	-0.2730	-0.6178

As all of the correlations were negative, it was not statistically meaningful to analyze the differences between the groups. The only clear indication is that the learning-disabled and normally-achieving groups were equally inaccurate when evaluating their own performance.

Part B

In Part B of the study, 15 of the learning-disabled children received training in the use of pragmatic strategies for three days for half an hour a day, while the remaining 15 were engaged in irrelevant tasks. To test the effects of training on linguistic complexity, linguistic modification, pragmatic awareness, pragmatic behavior, locus of control and accuracy of self-evaluation, 2 (Groups) x 2 (Partners) x 2 (Measures) factorial analyses of variance with repeated measures on the partners and measures factors were used to analyze the data. The trained and untrained learning-disabled groups comprised the Groups factor; the peer and younger partner, the Partners factor and the pretest and posttest, the Measures factor. To test the maintenance and generalization effects of training of the 15 learning-disabled children, 2 (Partners) x 4 (Measures) factorial analyses of variance with repeated measures on both factors were used to analyze the data of the six above-mentioned variables. Here, the performance of the trained group with the peer and younger partner over the four test sessions (pretest, posttest, maintenance and generalization checks) were analyzed.

The analyses confirmed the hypotheses of Part B, that training in pragmatic strategies would increase pragmatic awareness and use of pragmatic strategies of learning-disabled children. However, the training failed to increase their accuracy when evaluating their own performance. The learning-disabled children maintained their increased use of pragmatic strategies over time, but this increase did not generalize to another task.

Interestingly, training was found to have an effect on the linguistic complexity and locus of control belief of the learning-disabled children. The findings are reported and discussed in detail below.

Pragmatic Awareness

The first hypothesis of Part B was that training in pragmatic strategy use would increase pragmatic awareness of learning-disabled children.

Recall that a graduate student assistant re-scored 15 of the children's protocols according to the procedure outlined in Appendix VIII. The correlations between her scores and those of the first scorer was .61.

The analyses indicated that training did increase learning-disabled children's pragmatic awareness. A main effect for Groups was observed on the 2 (Groups) x 2 (Partners) x 2 (Measures) analyses of variance: [$F(1,23)= 11.1693$; p .01]; as well as a reliable Group x Measure interaction: [$F(1,84)= 11.5185$; p .01]. Table 8 presents the groups' means for pragmatic awareness.

Table 8

Pragmatic Awareness of Trained and Untrained Learning-Disabled Children.[a]

	Pretest		Posttest		Total	
Trained	32.267	(10.319)	42.000	(17.301)	37.133	(14.951)
Untrained	29.867	(14.171)	24.333	(10.726)	27.100	(12.769)
Total	31.067	(12.349)	33.167	(16.823)		

[a] As there were no main effects for the Partners factor, these means combine the scores for interactions with the peer and younger partners. There were no Groups x Partners x Measures interactions.

The statistically reliable Groups x Measures interaction is of specific interest to this hypothesis. Bonferroni t-tests (Myers, 1978) were used to test the reliability of differences between means obtained through repeated measures. Here, the t-tests indicated that the trained group's posttest mean differed reliably from the other means. The trained learning-disabled children expressed more pragmatic awareness after training than did the untrained group. This finding conforms to previously reported results of success in facilitating learning-disabled children's metacognitive abilities by training them to be more strategic (Torgesen & Goldman, 1977). The findings also support the hypothesis that learning-disabled children are deficient in production rather than in ability since learning-disabled children were induced to express spontaneously more pragmatic awareness of socio-linguistic strategies through training. Figure 1 presents a graph of the increase of articulated pragmatic awareness of the trained group as compared to the slight decrease in the untrained group on the posttest. The results of such short-term training should encourage researchers in the area of metacognitive abilities of learning-disabled children.

Pragmatic Strategies

The second hypothesis of Part B, that training learning-disabled children to use pragmatic strategies will increase the number of strategies used by learning-disabled children was confirmed. This increase was maintained after four days, although it did not generalize to another task.

A graduate student assisted in establishing the reliability of the scores by re-scoring 15 protocols chosen at random from the three groups involved in the study. She re-scored all of the transcripts in the protocols to establish reliability over all four testing sessions. The correlation

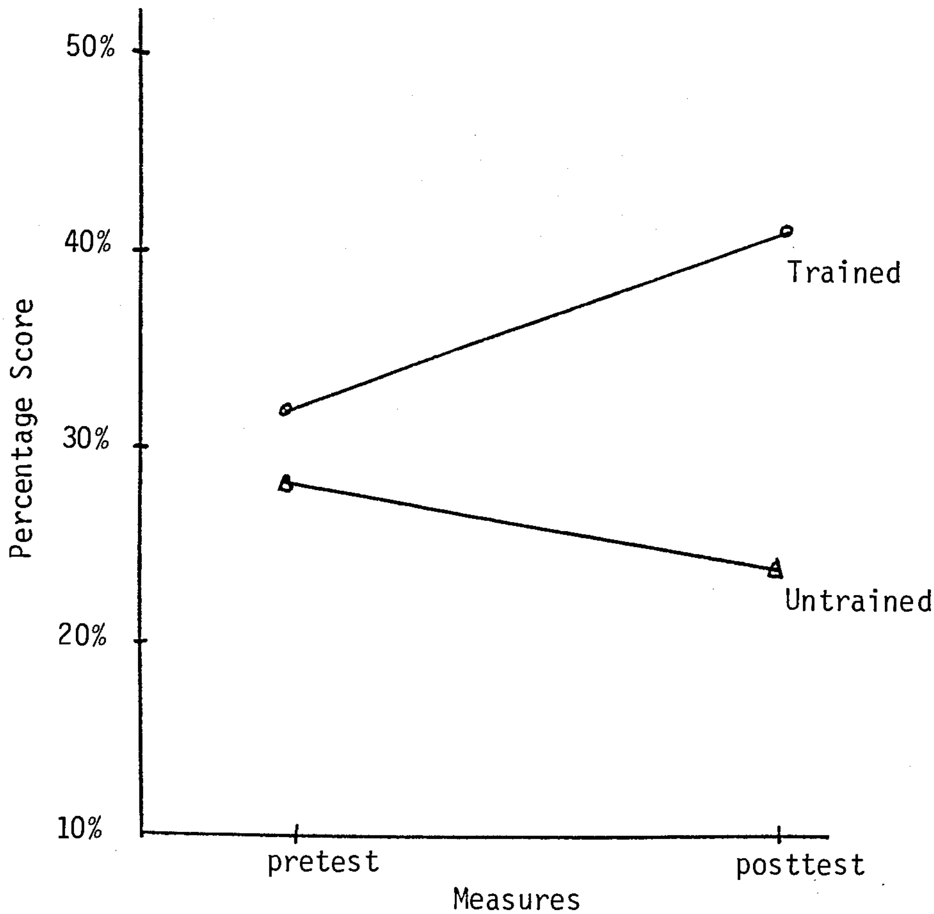

Figure 1. Pragmatic Strategy Awareness of Trained and Untrained Learning-Disabled Children.

between her scores and those of the first scorer was .92.

The analyses of the total number of strategic behaviors are reported first; followed by those of the sub-variables of main ideation, subordinate ideation and sequencing.

The total number of strategic behaviors variable yielded main effects for the Groups factor: [F (1,28) = 35.8444; $p < .01$] Measures: [F (1,84) = 11.4900; $p < .01$]; and a reliable Groups x Measures interaction: [F (1,84) = 29.0956; $p < .01$]. Table 9 presents the means for the trained and untrained learning disabled groups on the total number of strategic behaviors variable. Of particular interest to the above hypothesis is the Groups x Measures interaction. Bonferroni t-tests indicated that the trained group used more strategies in total at the pretest than the untrained group of learning-disabled children (critical difference = 2.785; observed difference = 3.934). However, the difference between the two groups at posttest is considerably greater (observed difference = 10.033). Thus, it may be inferred that training did have an effect on the strategy use of learning-disabled children. Figure 2 presents the interaction graphically. There were no statistically reliable main effects for the Partners factor; nor were there any statistically reliable effects on the Groups x Partners, Partners x Measures nor Groups x Partners x Measures interactions.

Table 9

Performance Means of Trained and Untrained Learning-Disabled Groups.[a]

	Pretest		Posttest		Total	
	M	(S.D.)	M	(S.D.)	M	(S.D.)
Trained	16.367	(4.454)	21.333	(5.142)	18.850	(5.424)
Untrained	12.433	(3.277)	11.300	(3.196)	11.867	(3.260)
Total	14.400	(4.400)	16.317	(6.604)		

[a] Bonferroni t-tests indicate that pretest differences are reliable (critical difference = 2.785; observed difference = 3.934). Note, however, that posttest differences are considerably greater (observed difference = 10.033).

Table 10

Main Ideation of Trained and Untrained Learning-Disabled Children.[a]

	Pretest		Posttest		Total	
	M	(S.D.)	M	(S.D.)	M	(S.D.)
Trained	2.100	(1.539)	4.700	(2.307)	2.800	(2.345)
Untrained	1.067	(0.944)	0.900	(1.348)	1.817	(1.631)
Total	1.583	(1.369)	2.800	(2.679)		

[a] These means reflect combined scores for the Partners factor as no reliable main effect for partners was observed.

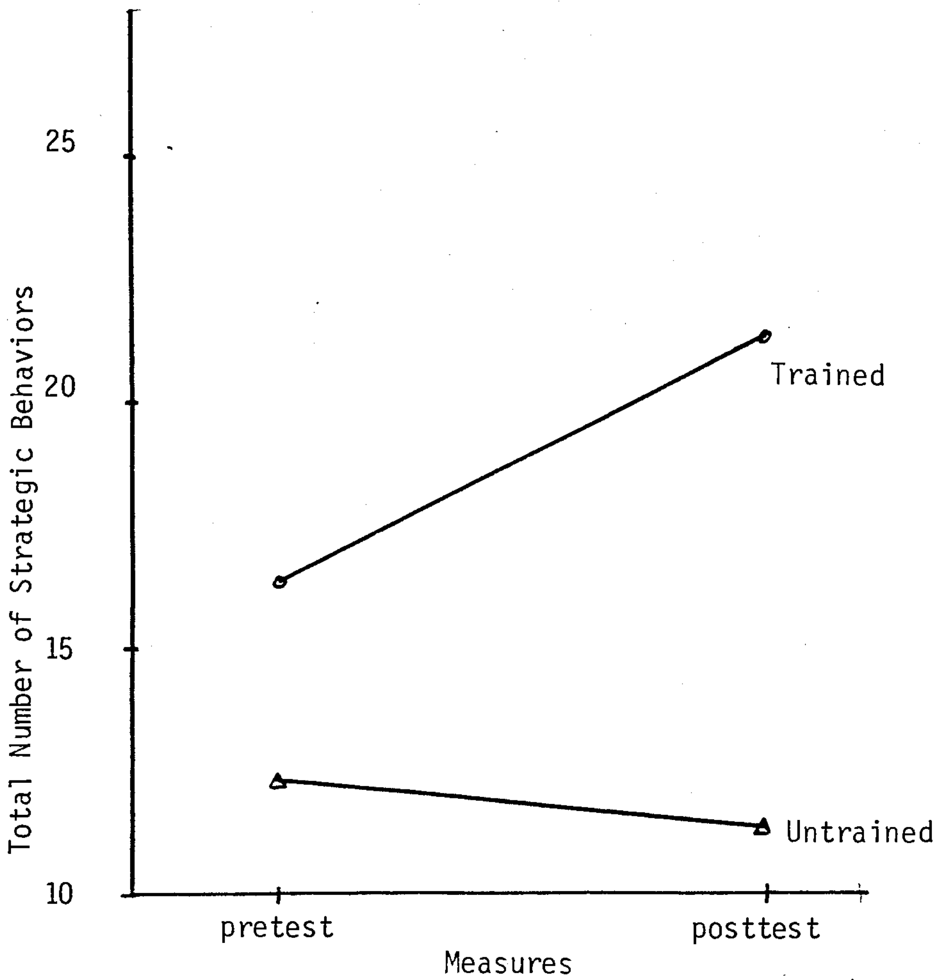

Figure 2. Total Number of Strategic Behaviors Used by Trained and Untrained Learning-Disabled Children.

Main Ideation. Table 10 presents the group means of the trained and untrained learning-disabled groups on the pre and posttest measures of their use of pragmatic strategy of main ideation. While the trained group used more of these strategies at the pretest than did the untrained group; it is important to note that the differences between the groups' means were considerably greater at posttest. The analyses yielded reliable main effects for Groups: [F (1,28) = 26.6428; $p < .01$] ; Measures: [F (1,84) = 32.2318; $p < .01$] and a reliable Groups x Measures interaction: [F(1,84) = 41.6673; $p < .01$]. The Groups x Measures interaction is of specific interest to the hypothesis that training would increase the number of strategic behaviors used by learning-disabled children. Figure 3 presents this interaction graphically. Bonferroni t-tests revealed that the trained groups used reliably more main ideation strategies on the posttest than they did on the pretest (critical difference = 0.746; observed difference = 2.600), while the untrained group used slightly less main ideation strategies at the posttest compared to the pretest (observed difference = 0.167). Although the trained group used more main ideation strategies than the untrained group at pretest (observed difference = 1.033), the difference between the groups on the posttest was considerably larger (observed difference = 3.800). In view of these findings, it is plausible to suggest that training facilitated learning-disabled children's use of main ideation strategies in a socio-linguistic interaction.

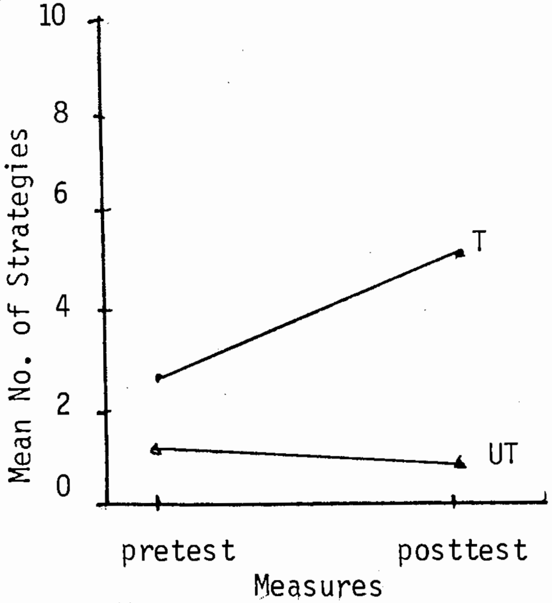

Figure 3. Main Ideation

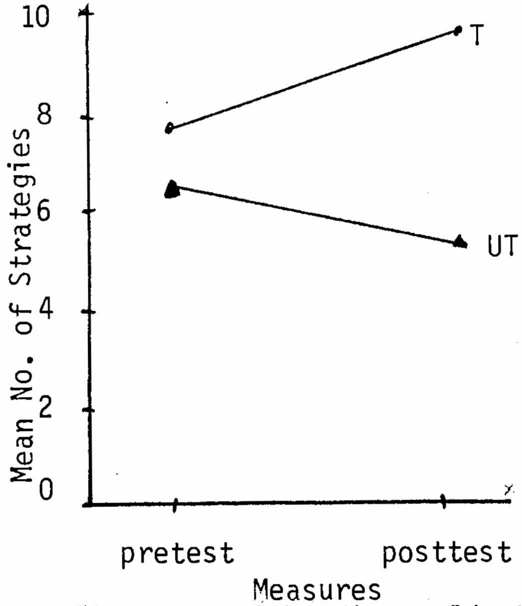

Figure 4. Subordinate Ideation

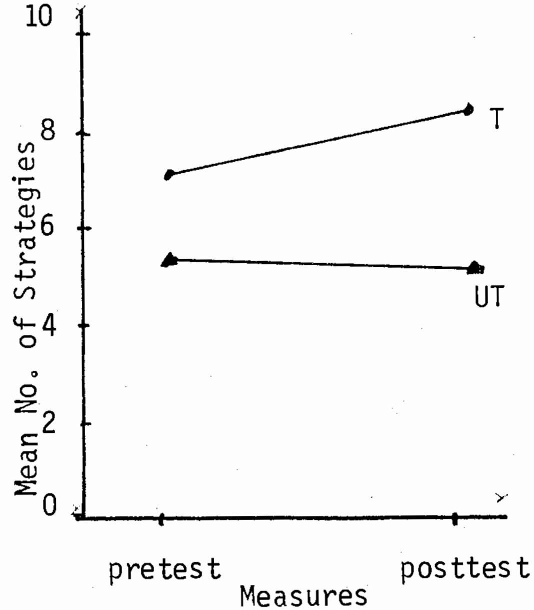

Figure 5. Sequencing

Figures 3-5. Mean Use of Three Pragmatic Strategies by Trained (T) and Untrained (UT) Learning-Disabled Children.

Subordinate Ideation. A similar pattern of data emerges in the use of subordinate ideation strategies. A reliable Groups x Measures interaction [$F(1,84) = 9.9569$; $p < .01$] confirmed the hypothesis that training in pragmatic strategies would increase the use of strategies by learning-disabled children. Table 11 presents the groups means. It can be seen that while the trained and the untrained groups differed in their overall use of this strategy [$F(1,28) = 34.3213$; $p < .01$], post hoc Bonferroni t-tests reveal that differences are, again, considerably greater at posttest (critical difference = 0.956; observed difference = 3.400) compared to the pretest difference (observed difference = 1.700). Figure 4 presents the interaction. It is apparent that training did increase the use of strategies of subordinate ideation in learning-disabled children.

Table 11

Subordinate Ideation of Trained and Untrained Learning-Disabled Children.[a]

	Pretest		Posttest		Total	
Trained	7.800	(2.041)	9.000	(1.742)	8.400	(1.976)
Untrained	6.100	(1.561)	5.567	(1.633)	5.833	(1.607)
Total	6.950	(1.995)	7.283	(2.408)		

[a] These means reflect combined scores for the Partners factor as no main effect for partners was observed.

Sequencing. Data on the last pragmatic strategy, sequencing, shows a similar pattern again. A statistically reliable main effect for Groups [F (1,84) = 24.3437; $p < .01$] and a statistically reliable Groups x Measures interaction: [F(1,84) = 6.1336; $p < .01$] were obtained. The groups means are presented in Table 12. The trained group used more strategies of sequencing at posttest than did the untrained group. Although the trained group used more sequencing strategies than the untrained on the pretest (critical difference = 0.925; observed difference = 1.166); this difference was considerably greater at posttest (observed difference = 2.867). Figure 5 presents the interaction graphically.

Table 12

Sequencing of Detail by Trained and Untrained Learning-Disabled Children.[a]

	Pretest		Posttest		Total	
Trained	6.433	(1.851)	7.700	(1.803)	7.067	(1.921)
Untrained	5.267	(1.530)	4.833	(1.487)	5.050	(1.512)
Total	5.850	(1.783)	6.267	(2.185)		

[a] These means reflect combined scores for the Partners factor as no statistically reliable main effect for partners was observed.

Although no immediate and obvious explanation can be found for the trained group using more strategies than the untrained group prior to training, the consistent data patterns on strategy variables at posttest are provocative and permit cautious claims of the efficacy of the training. The trained group increased their use of pragmatic strategies in comparison to the untrained group when teaching another child a new game. These results conform to those of previous studies (Torgesen & Goldman, 1977; Wong, 1978) where training was found to facilitate learning-disabled children's strategic behavior. It appears that normally-achieving children spontaneously produce strategic behavior in a socio-linguistic task whereas learning-disabled children do not. However, with training, learning-disabled are capable of being planful and organized in their approach to a task. Why learning-disabled children do not spontaneously produce strategic behavior may be the result of a more passive cognitive style. However, more empirical research is needed to answer that question conclusively.

Maintenance and Generalization

The third hypothesis of Part B of this study proposed that the skills of strategy use learned through training by learning-disabled children would be maintained over time and would generalize to another task. The first part of the hypothesis was confirmed. The second part was not: the learned skills were maintained but no generalization effects were observed.

To test this hypothesis, the data were analyzed using a 2 (Partners) x 4 (Measures) factorial analysis of variance with repeated measures on both factors. A statistically reliable main effect for the Measures factor was observed on the total number of strategies used by learning-disabled trained children: [F (3,42) = 13.2598; $p < .01$]. Table 13 presents the performance means of the trained group with the peer and younger partners. While the learning-disabled children used as many strategies with the peer and younger partners, their use of pragmatic strategies increased after training. Furthermore, their use of pragmatic strategies increased at the maintenance test. However, when asked to teach a new game to the partners, their use of strategies reverted back to the same level as that of the pretest. Figure 6 illustrates this effect. Clearly, it can be seen that the training effects were maintained after four days but were not generalized to another task.

To reduce the appearance of repitition, let me point out that analyses of the three sub-variables of strategic behavior: main ideation, subordinate ideation and sequencing yielded the same patterns of results as the total number of strategies variable discussed above. There were no observed differences in strategy use between the children's instructions to peer or younger partner, nor was there a Partners by Measures interaction. However, for all three sub-variables, a statistically reliable main effect was revealed for the Measures factor: main ideation: [F (3,42) = 11.9045; $p < .01$]; subordinate ideation: [F (3,42) = 6.7420; $p < .01$]; and sequencing: [F (3,42) = 4.8425; $p < .01$]. The use of pragmatic strategies increased after training and was maintained after four days, but decreased when the new task was presented.

Table 13

Maintenance and Generalization of Learned Use of Pragmatic Strategy by Learning-Disabled Children.[a]

Partner	Pretest		Posttest		Maintenance Test		Generalization Test		Total	
	M	(S.D.)	M	(S.D.)	M	(S.D.)	M	(S.D.)	M	(S.D.)
Peer	15.933	(3.990)	21.133	(5.290)	21.667	(3.830)	18.467	(6.312)	19.300[b]	(5.356)
Younger	16.800	(5.144)	21.533	(5.167)	20.867	(4.565)	17.733	(3.731)	19.233	(4.996)
Total	16.367	(4.545)	21.333[c]	(5.142)	21.267[c]	(4.160)	18.100	(5.108)		

[a] Total number of strategic behaviors

[b] Means between partners were not reliably different

[c] Bonferroni t-tests indicate that posttest and maintenance test scores are reliably different from pretest and generalization test scores (critical difference = 2.378).

Figure 6. Total Number of Pragmatic Strategies Used by Trained Learning-Disabled Children on Four Observations.

Table 14 presents the means of the two groups on the three sub-variables: main ideation, subordinate ideation and sequencing. Because the Partners factor did not yield reliable differences, the means represent combined scores for the two partners. Figure 7 shows the increases of learning-disabled children's use of subordinate ideation and sequencing strategies at posttest and test for maintenance effects. In contrast, the use of main ideation strategies increased after training and was maintained. It may be seen that at the test for generalization, the trained group's use of strategies decreased. Although the learning-disabled children decreased in their use of main ideation strategies with the new task, their performance mean at generalization check was only slightly less than the posttest mean and reliably higher than their performance mean on the pretest. Although not statistically reliable, it appears that some generalization of this strategy use did occur.

The present findings that learning-disabled children may be trained to use more pragmatic strategies and, furthermore, that learning-disabled children maintain the learned skills over time should be encouraging for educators and researchers working with learning-disabled children. The literature on generalization effects confirm the difficulties in obtaining generalization of trained skills. The skills, once learned, seem to be task-specific. However, there might have been motivational problems underlying the lack of generalization in this study. While the experimental game, Mancala, was of high motivational interest presenting novelty to the children, the generalization game, Helix, was simply another version (three-dimensional) of a familiar game, tic-tac-toe. The apparent lack of appeal of the latter game and its intrinsic lack of complexity might well have been the reason that the children used fewer strategies when explaining this game to a partner.

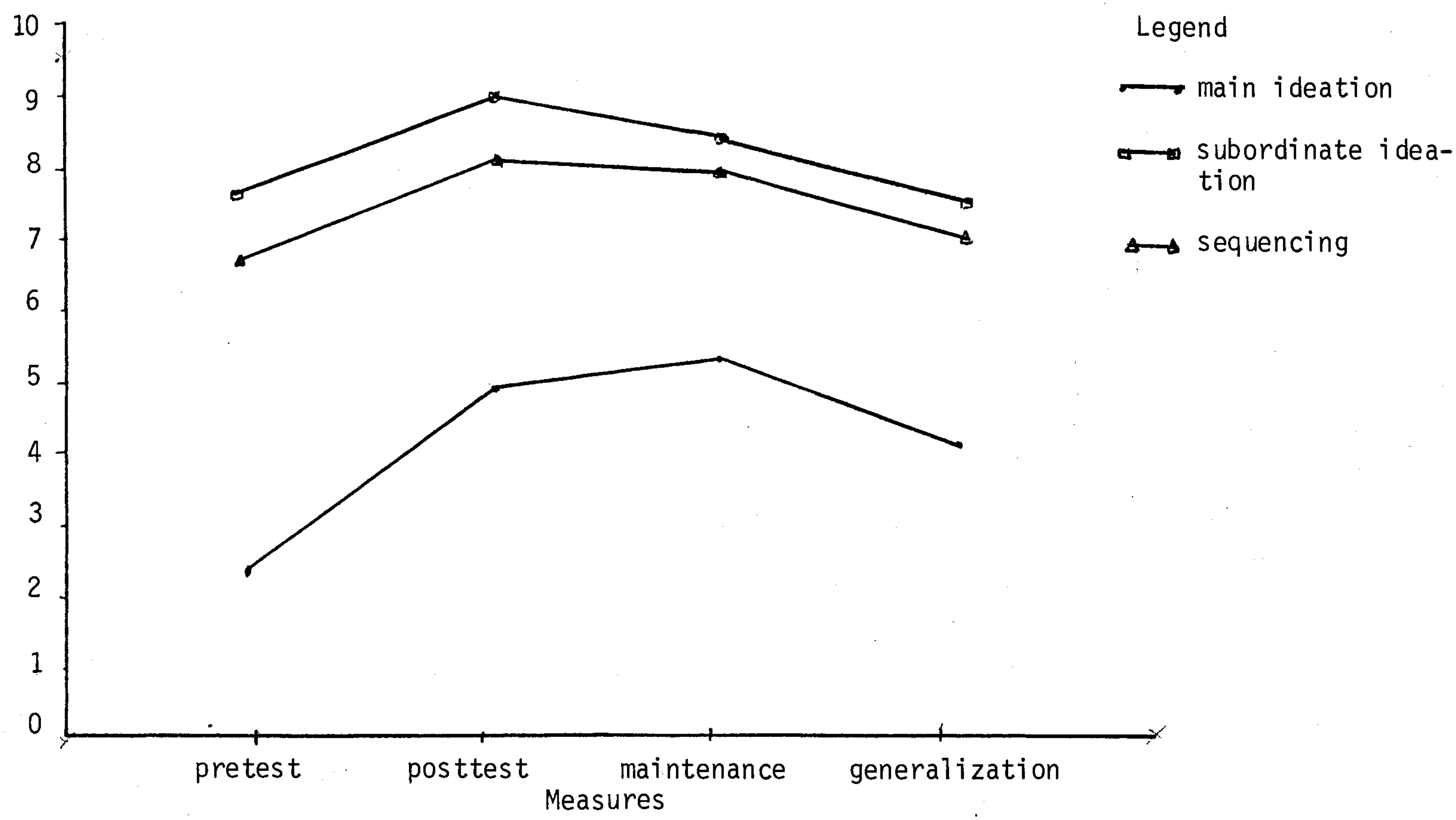

Figure 7. Maintenance and Generalization of Strategy Use by Trained Learning-Disabled Children.

Table 14

Performance Means of Trained Learning-Disabled Children on Three Pragmatic Strategies.

	Pretest		Posttest		Maintenance		Generalization	
Main Ideation (critical difference = 1.305)	2.100	(1.539)	4.700	(2.307)	4.900	(2.468)	3.867	(2.097)
Subordinate Ideation (critical difference = 1.029)	7.800	(2.041)	9.000	(1.742)	8.733	(1.639)	7.400	(2.191)
Sequencing (critical difference = 0.984)	6.433	(1.851)	7.700[a]	(1.803)	7.633[a]	(1.712)	6.867	(2.030)

[a] Indicates that posttest and maintenance test means are reliably different from pretest and generalization scores according to post hoc t-tests.

Linguistic Complexity and Modification

The fifth hypothesis of Part B of this study addressed the questions of whether training in the use of pragmatic strategies would increase the complexity of learning-disabled children's language and whether training would increase their linguistic modification when communicating with a younger child. It was difficult to expect that training over three days would have a substantial effect on behaviors that are formed over years of linguistic interaction. Indeed, when examining the children's linguistic modification, no changes were observed after training. The analyses yielded no statistically reliable main effects for the Partners factor, nor did they yield reliable Partners x Measures interactions.

Analyses of the linguistic variables revealed however that training did increase the complexity level of learning-disabled children's language. Eight of the 19 linguistic variables yielded statistically reliable Groups x Measures interactions: total number of words: [$F(1,84) = 4.2504$; $p < .05$]; number of words in t-units:[$F(1,84) = 8.3054$; $p < .05$]; number of t-units: [$F(1,84) = 11.8217$; $p < .01$]; number of clauses: [$F(1,84) = 12.05644$; $p < .01$]; adverbs: [$F(1,84) = 4.0036$; $p < .05$]; appositives: [$F(1,84) = 9.3226$; $p < .05$]; total number of complexities: [$F(1,84) = 6.5272$; $p < .05$]; and ratio of linguistic complexity: [$F(1,84) = 7.0057$; $p < .05$]. Table 15 presents the groups' means on the eight linguistic variables at pretest and posttest. Figure 8 shows the difference between the trained and untrained learning-disabled children's ratio of linguistic complexity after training. It may be seen that the trained group increased the complexity of their language at posttest. Post hoc Bonferroni t-tests indicated that the Groups x Measures interaction of the ratio of linguistic complexities variable was

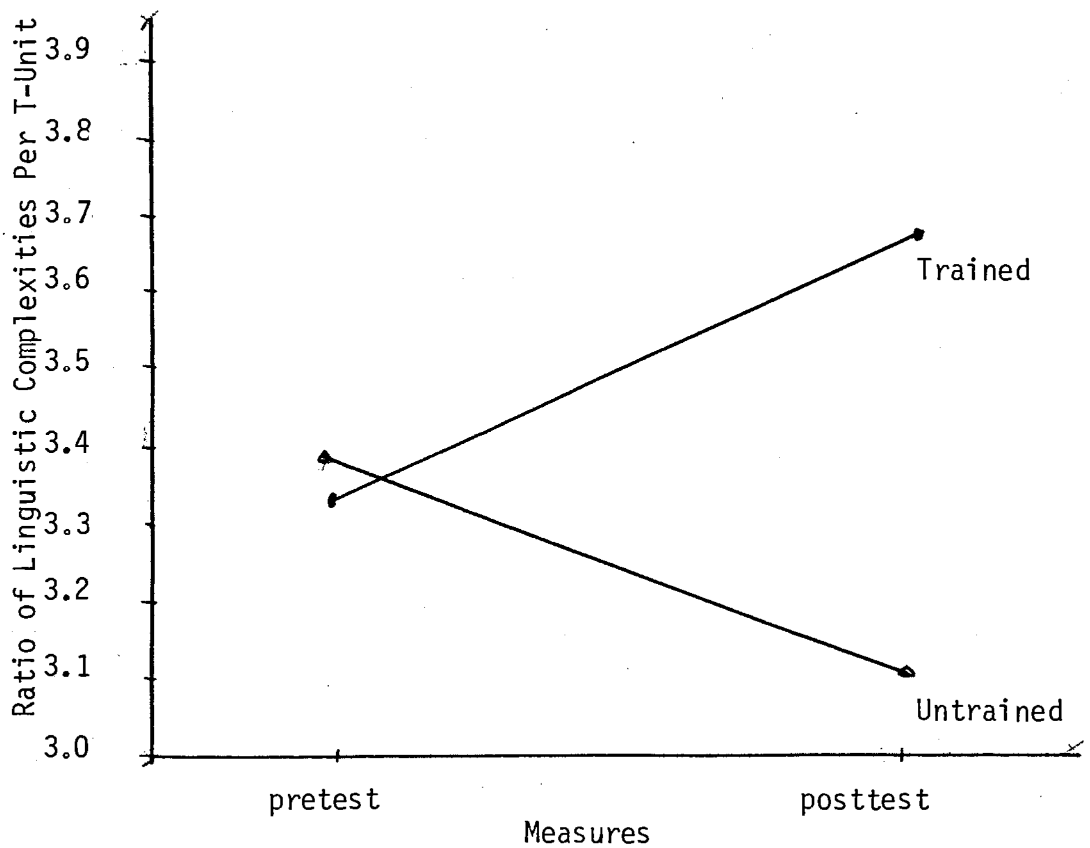

Figure 8. The Ratio of Linguistic Complexities Per T-Unit of Trained and Untrained Learning-Disabled Children on Pretest and Posttest Measures.

reliable at posttest (critical difference: .336, observed difference: .467); whereas, the Groups x Measures interactions of the seven remaining variables were the result of differences extant at pretest between the trained and untrained group. To facilitate the ease of reading, these t-test results are reported in Table B in Appendix X. The trained group for some reason used more words, t-units and complexities with the younger partner than did the untrained group. One explanation may be that the trained group was more familiar with first-graders than the untrained group of children. Alternately, the trained group consisted of children who more readily became at ease with the situation and thus became more verbal. However, as their linguistic complexity at pretest did not differ from the untrained group, it may be assumed that the two groups consisted of children with similar linguistic facility. Thus, the results clearly indicate that training produced a positive change in learning-disabled children's language. It appears that verbal modeling, rehearsal and feedback facilitated their use of more complex language. This should be encouraging for learning-disabilities practitioners concerned with increasing linguistic abilities of learning-disabled children. The results provide support for the hypothesis that learning-disabled children are 'inactive' learners rather than deficient in abilities (Wong, 1979 b).

Two (Partners) x 4 (Measures) factorial analyses of variance with repeated measures on both factors were used to analyze the data and test for the effects of training on the maintenance and generalization of learned skills of the trained group of learning-disabled children. The linguistic variables were included in these analyses. Of particular interest here is the change in the ratio of complexities per t-unit of the trained group of children over the four test sessions. Figure 9 illustrates this change. As

<u>Figure 9.</u> Trained Learning-Disabled Children's Mean Ratio of Linguistic Complexities Per T-Unit on Four Observations.

no statistically reliable main effects were found for the Partners factor, the means of the ratio of complexities per t-unit variable present the children's combined performance with the peer and younger partner.

The trained group increased the complexity of their language at maintenance. However, when asked to teach a new game to the partners, the learning-disabled children's language reverted to their pretest level of complexity. Post hoc Bonferroni t-tests indicated that the pretest and post-test means were not statistically reliably different (critical difference = 0.447; observed difference = .225). However, the difference between pretest and maintenance means was statistically reliable (observed difference = 0.508).

Figures 10 and 11 present the performance means of the trained learning-disabled children on the two variables from which the ratio of complexities per t-unit variable is derived: the total number of complexities variable and the number of t-units variable. It may be seen that while the mean total number of complexities increases at the test for maintenance, the mean number of t-units decreases slightly, resulting in the higher mean ratio of complexities per t-unit at maintenance.

It appears that the combination of training, practice and task familiarity facilitated the learning-disabled children's use of more complex and efficient language. I have previously discussed their failure to generalize other learned skills when teaching the game of Helix. From Figures 10-12, it may be seen that the children used substantially fewer words, t-units and complexities when teaching Helix to their partners; even less at pretest with the Mancala game. The children had apparently much less to say about Helix. Perhaps a more complex generalization task would have elicited more complex language. Future empirical research to investigate this possibility appears warranted.

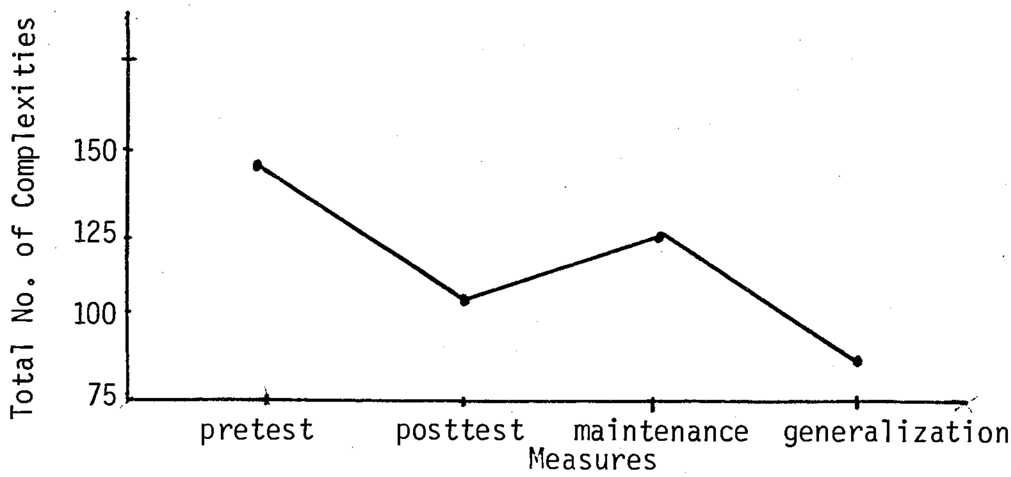

Figure 10. Total No. of Complexities.

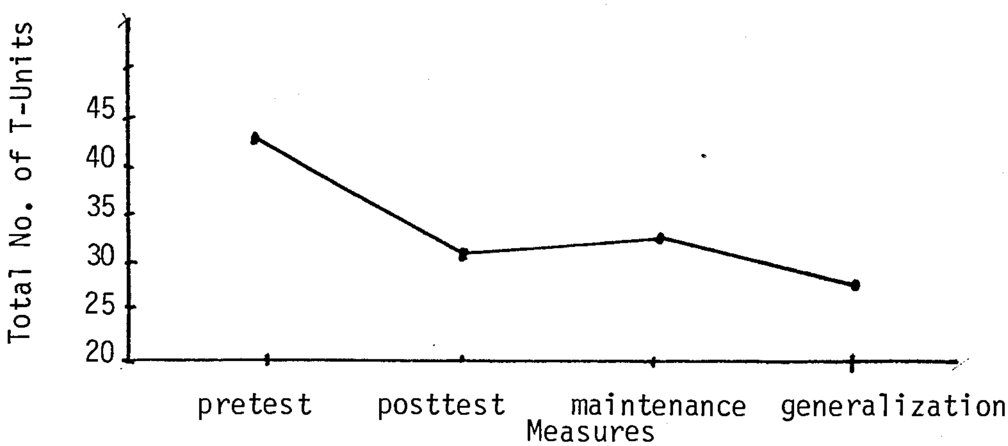

Figure 11. Total No. of T-Units.

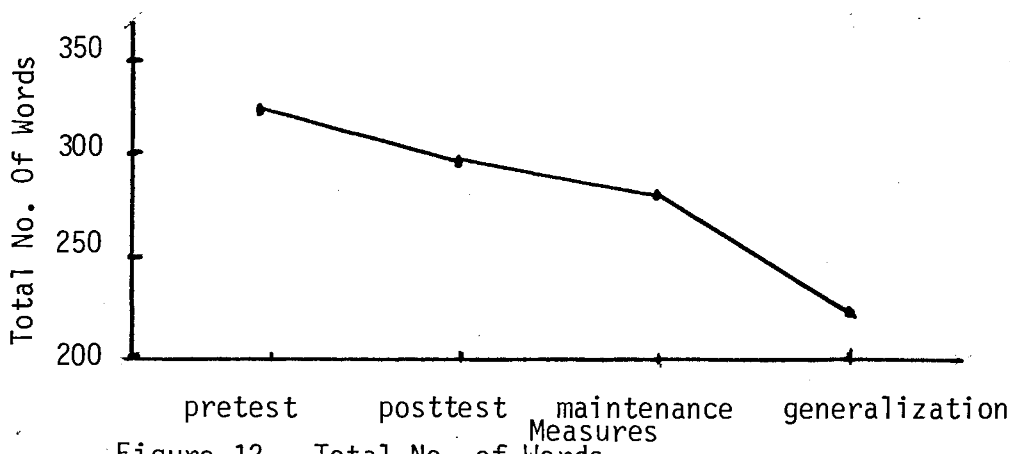

Figure 12. Total No. of Words.

Figures 10-12. Total Number Of Complexities, T-Units and Words Used by Learning-Disabled Children .

Table 15

Trained and Untrained Learning-Disabled Groups Performance Means on Eight Linguistic Variables.[a]

Variable	Pretest		Posttest		Total	
Total No. of Words	M	S.D.	M	S.D.	M	S.D.
Learning-Disabled						
Trained	321.467	(103.886)	284.567	(81.382)	303.017	(94.373)
Untrained	257.667	(77.152)	267.767	(104.999)	262.717	(91.491)
Total	289.567	(96.256)	276.167	(93.521)		
Words in T-Units						
Trained	276.633	(88.084)	240.000	(70.202)	258.317	(81.100)
Untrained	203.567	(57.518)	223.000	(85.911)	213.283	(73.143)
Total	240.100	(82.444)	231.500	(78.254)		
No. of T-Units						
Trained	40.867	(14.529)	32.867	(10.068)	36.867	(13.033)
Untrained	31.167	(11.133)	33.600	(11.156)	32.383	(11.117)
Total	36.017	(13.733)	33.233	(10.542)		
No. of Clauses						
Trained	49.267	(16.793)	39.000	(9.847)	44.133	(14.597)
Untrained	37.300	(12.267)	39.200	(13.092)	38.250	(12.612)
Total	43.283	(15.777)	39.100	(11.486)		
Total No. of Complexities						
Trained	132.767	(45.229)	113.367	(27.615)	123.067	(38.419)
Untrained	98.700	(24.382)	104.100	(37.879)	101.400	(31.699)
Total	115.733	(39.910)	108.733	(33.195)		
Ratio of Linguistic Complexity						
Trained	3.313	(.648)	3.568	(.825)	3.440	(.746)
Untrained	3.358	(.640)	3.101	(.459)	3.229	(.567)
Total	3.335	(.639)	3.334	(.702)		

Variable	Pretest		Posttest		Total	
	M	S.D.	M	S.D.	M	S.D.
Adverbs						
Trained	28.567	(13.960)	20.667	(9.110)	24.617	(12.347)
Untrained	22.733	(10.279)	21.333	(10.433)	22.033	(10.292)
Total	26.650	(12.505)	21.000	(9.716)		
Appositives						
Trained	0.167	(0.531)	0.700	(1.022)	0.433	(0.851)
Untrained	0.033	(0.183)	0.000	(0.000)	0.017	(0.129)
Total	0.100	(0.399)	0.350	(0.799)		

[a] Only these eight of the 19 linguistic variables yielded reliable Groups x Measures interaction.

Accuracy of Self-Evaluation

The fourth hypothesis of Part B of this study is that training in pragmatic strategies will increase learning-disabled children's accuracy when evaluating their own performance. To test this hypothesis, the trained and untrained learning disabled children's self-evaluations were correlated with my evaluations of their use of pragmatic strategies. In Table 16, it can be seen that all of the correlations with the younger partner were negative. Comparing these correlations was, therefore, not meaningful. The correlations from the two groups with the peer partner were compared following Guilford's procedure for comparing uncorrelated co-efficients of correlations (Guilford & Fruchter, 1978). None of the differences reached reliable levels.

It appears that training did not increase learning-disabled children's accuracy at evaluating their own performance. Alternately, the scale of self-evaluation may have been too general in nature; not eliciting specific selfevaluatory responses from any of the children.

Table 16

Correlations Between Experimenter Evaluation and Self-Evaluations of Performance.

	Pretest	Posttest
Trained Learning-Disabled Children		
Peers	0.12	0.32
Youngers	-0.18	-0.14
Untrained Learning-Disabled Children		
Peers	0.15	0.36
Youngers	-0.37	-0.20

Locus of Control

The fifth hypothesis of this study addresses the question of whether training learning-disabled children to use pragmatic strategies will increase the internality of the statements made when asked to evaluate their own performance.

Reliability

The correlation between the first and second scorers evaluation of the externality or internality of the children's statements was .61. This rather low coefficient dictates a cautious interpretation of the results.

The 2 (Groups) x 2 (Partners) x 2 (Measures) factorial analyses of variance used to analyze the data yielded a statistically reliable Groups x Measures interaction: [$F(1,84) = 39.7737$; $p < .01$]. The results indicate that training did increase the internality of locus of control of the statements of the trained learning-disabled children. The groups' means are shown in Table 17.

Table 17

Internal and External Locus of Control Statements of Trained and Untrained Learning-Disabled Children.[a]

	Pretest		Posttest		Total	
	M	S.D.	M	S.D.	M	S.D.
Trained	1.700[b]	(0.466)	1.067	(0.254)	1.383	(0.490)
Untrained	1.633	(.490)	1.833	(0.379)	1.733	(0.446)
Total	1.667	(0.475)	1.450	(0.502)		

[a] The means combine performance with peer and younger partners as no statistically reliable main effect was observed for the Partners factor.

[b] 1 = Internal Locus of Control Statement; 2 = External Locus of Control Statement.

The trained and untrained group did not differ at pretest: both groups responded with more external locus of control statements. However, post hoc Bonferroni t-tests indicate that the difference between the two groups' means at posttest is statistically reliable (critical difference = .325; observed difference = .766). It appears that training induced the children to become more self-reflective about their own performance. Possibly, the self-monitoring and feedback components of the training program encouraged the children's feelings of responsibility for the outcome of their own performance.

Research Limitations

One possible reason for the failure of this study to yield results indicating that learning-disabled children modify their language less to their younger partners than normally-achieving children may have been due to the lack of counter-balance in the order of the peer and younger partner. Most of the subjects taught the younger partner after the peer. The analyses of the linguistic data at maintenance demonstrated that practice and training increased the complexity of the learning-disabled children's language. Therefore, it seems possible that practice in teaching the game to the peer partner first may have increased the children's use of complex language when teaching the younger child. An alternative explanation may be that the children more readily assumed the role of 'teacher' with the younger partner, resulting in a more instructional approach and, therefore, more complex speech to the younger partner.

In retrospect, the study should have included measurement of pragmatic awareness and self-evaluation of performance at the tests for maintenance and generalization. Finally, a more refined scale of the children's self-evaluation of performance and a more complex game for generalization would have improved the possibility for more firm interpretations of the results with regard to these two areas.

V. CONCLUSION

The results of this study did not replicate the findings of Bryan and Pflaum (1978) in which learning-disabled children were found to use less complex language and modify their language less to a younger audience than normally-achieving peers. Similar to the recent findings of Donahue (1980) who observed that learning-disabled children used polite forms of speech equal in syntactic/semantic complexity to those used by their normally-achieving peers, the present study found that learning-disabled children used as complex language and modified their speech to a younger audience as much as their normally-achieving classmates. However, the present results indicate that learning-disabled children use fewer strategies of organization and planfulness than normally-achieving children when communicating with another child in a semi-structured communication task. It appears that learning-disabled children lack metacognitive linguistic skills.

Learning-disabled children appear to think less spontaneously about their communication process than their normally-achieving peers. This failure to engage spontaneously in strategic behavior may be the result of a passive cognitive style. However, the 'active' style of a learner is perhaps more malleable than is generally assumed in that training increased learning-disabled children's pragmatic awareness and use of pragmatic strategies and internal locus of control beliefs.

That short-term training in this study increased the complexity of language used by learning-disabled children indicates the need to reconsider what underlies language difficulties and communication problems of learning-disabled children. I submit the cautious claim that when adults perceive learning-disabled children as being deficient in their oral language, the possibility exists that the latter may not have actual syntactic/semantic structural deficits but rather they may be less organized and less planful in the execution of their oral language. The results of this study suggest that learning-disabled children may engage in less deliberate and less conscious control of the content of their speech.

That generalization of training was not obtained indicates the important need of carefully designing transfer tasks. Finally, for both practitioners and researchers in learning-disabilities, the results of this study encourage the possibility of training learning-disabled children in metacognitive skills and further encourage the development of more refined analyses of learning-disabled children's communicative abilities.

APPENDIX I

Mancala

MANCALA is said to have originated in Africa over 3500 years ago. It was played by tribes in every part of the continent, and, consequently, it is frequently referred to as the national game of Africa or African stone game. The natives played by scooping out pits in the sand and small stones were used as playing pieces. Different tribes and villages had their own names for the game, but the most common name has been Mancala. The game has been very popular because it is simple and easy to learn as well as being intellectually stimulating for children and adults alike.

The rules for the Mancala game were slightly modified to cut down on the total playing time of the game. The rules are presented below:

1. Mancala is a game for two players.
2. Players sit on opposite sides of the board. The six pits directly in front of each player are his pits. The large pit to the player's right is his 'cala'.
3. To begin a game, pegs are placed in each of the twelve pits. The object of the game is for a player to accumulate more pegs in his 'cala' than his opponent.
4. The game begins by the first player picking up all of the pegs in any of his own six pits. He distributes them, one at a time, in each pit around the board to his right. He places a peg in his own 'cala' and opponent's pits if there are enough, but never places a peg in his opponent's 'cala'.
5. If a player's last peg is placed in his own 'cala', he gets another turn.

6. The game is over when all six pits on one side are empty.

7. The player with the most pegs in his 'cala' wins the game.

APPENDIX II

Helix

HELIX - a 3-dimensional tic-tac-toe game challenging all ages.

To begin play the players must insert the 12 rods in the holes in the central section of the board. Each player or team then selects 24 beads of one color.

Rules. Players take turns placing beads on the metal rods, trying to form "lines" of four or more beads of one color. A "line" may consist of four beads of one color on any of the 12 rods; it may be horizontal at any of the four levels along the straight lines and arcs designated on the board; it may also be in a stairstep pattern along the lines and arcs on the board. A stairstep along an arc is called a "helix".

Each player must play defensively as well as offensively--he tries to block lines being formed by the opponent, as well as trying to form lines of his own.

Scoring. It is suggested that all 48 beads be played and points awarded on the following basis:

1 point for each line of beads.

1 bonus point for the first line of 4 beads.

2 points for each line of 5 beads.

The player with the highest total score is the winner.

APPENDIX III

Procedure for the Teaching of Mancala and Helix

Each subject was taught individually the board-games Mancala and Helix in the following manner:

I started by introducing the game, giving the children some background information and explaining the object of the game. I, then, explained how the game started, the rules and the conclusion and scoring of the game. We played one game during which any questions that the subject had were answered. At this point, I judged whether or not the subject knew how to play the game. If not, we played again and I clarified any points about the game that had remained unclear. When I was satisfied that the subject was familiar with the game; that is, understood the object of the game, could play according to the rules and understood how to conclude and score the game. I then asked the subject to teach the game to me to ensure that he knew what his task was when he was to teach the peer and younger partners. This procedure usually took about ten minutes.

APPENDIX IV

INTERVIEW QUESTIONNAIRE

Grade:	Name:	P.____________
Teacher:	Group:	Y.____________

When you teach somebody a game, what do you think is the most important thing to do?

Why?

How well do you think you taught the other child the game?

Really well   well   alright   not so good   really poorly

Why?

What would you do differently if you were to teach him another game?

What kinds of things do you think you could say or do to help somebody to learn the game better?

APPENDIX V

Daily Outline of Training Program

Day 1.

- Discussion of the general usefulness and validity of planful behavior when teaching a game to another person.
- Modeling of the teaching of Mancala by myself.
- Practice by subject in teaching Mancala to myself.
- Reinforcement and evaluation of planfulness.
- Discussion of general usefulness and validity of planful behavior.

Day 2.

- Discussion of general usefulness and validity of planful behavior when teaching a game to another person.
- Practice by subject in teaching Mancala with support from myself.
- Reinforcement and evaluation of planfulness.
- Discussion of general usefulness and validity of planful behavior.

Day 3.

- Discussion of general usefulness and validity of planful behavior when teaching a game to another person.
- Teaching of Mancala by subject to myself without support.
- Reinforcement and evaluation of planfulness.
- Discussion of general usefulness and validity of planful behavior.

APPENDIX VI

Directions for Scoring Language Samples

The directions to follow are in the order of the coding and scoring that was used by Tanis Bryan in the laboratory, bowling game study. In this study, only minor modifications of the scoring procedure were made and only in the order of notification of the codes and scores on the score-sheets.

A t-unit is composed of an Independent clause with all the dependent clauses attached to it. A clause must have a predicate. Thus, a t-unit will have one subject and one or more predicates.

The t-units are marked with parentheses at beginning and end and numbered in pencil in sequential order. Words that are not t-units are described in a later section.

1. Single main clauses with no dependent clauses are:

   I missed a lot (of mine).

   You did

   Can I try it once?

   Now you start again

2. Single main clauses with dependent clauses are: (Clauses are underlined).

   Ya gotta wait till the light goes on.

   I think that's where you're supposed to be there

   What you do is you just try it

   Yur supposed to wait until the light is out

   And if you put a spin on it like that it gives a little bit of help

And a buzzer will sound when the game is over

You know what I mean

If you find two main clauses strung together with a conjunction, you count them as two t-units. Conjunctions are and, but, or, nor, so, and (sometimes) for. The conjunction goes with the second t-unit.

(Then you do like that)[1] (and it lights up)[2] - 2 t-units

(Spin it softer over about there)[1] (and you might get one)[2] - 2 t-units

Watch out for deleted subjects in the second clause. These are co-ordinate predicates (discussed later) and are counted as 1 t-unit. For example:

(Mary ran up the hill and sat down) - 1 t-unit

but

(Mary ran up the hill) (and John sat down) - 2 t-units.

Commands are t-units (because subjects are deleted). For example:

Count 'em

Try to get the 20

Bowl again

Now wait till the light goes off

Spin it softer over about there

Now listen to me

"See" is coded as a command only when it stands alone or clearly indicates looking at something:

See (by itself)

See this

See right here

(When "see" is at the beginning of an utterance, it is an introductory word and is scored as a word excluded - discussed later - for example, See, I told you. When "see" is at the end of an utterance, it is scored as a tag unit - discussed later - for example, Get as close as you can like that, see).

"Remember" is not scored as a command and, therefore, not a t-unit.

<u>When 2 commands are strung together</u> - 2 t-units, for example:

1 2
(Go like that) ('n give it a little)

1 2
(Try to get the 20) ('n just have your score)

These are a bit difficult to do because they are hard to distinguish from <u>coordinate predicates</u> - one of the subordinate structures to learn to count later. A coordinate predicate consists of a main clause and an attached clause which has the same subject deleted in the second clause. For example, <u>John liked to play the game and wanted to continue</u> or <u>What you do is you just try to aim in here and try to get a 20</u>. The coordinate predicate has the one subject in the first clause and the same but deleted subject in the second. These structures are one t-unit. The commands do not have an overt subject in the first, so the second is not a reduced structure compared with it. In other words, in the coordinate predicate t-unit you find one subject stated and the second deleted. In the commands strung together with <u>and</u> you do not have an overt subject in either, so the second is in no way subordinate to the first and must be scored as equivalent to the first. Thus in the command situation, you have two equal structures and if one is a t-unit, the second must be too. So:

(Open the window) (and close the door) - 2 t-units

but:

(You open the window and close the door) - 1 t-unit

When 'unintelligible' or 'missed' appears in the data but enough information about the sentence structure is there to make it codable, count it as a t-unit. The rule is that 'unintelligible' can be used as a subject <u>or</u> as part of a predicate, but not as both in the same t-unit, and not as a whole predicate. Possible t-units are:

> <u>Unintelligible</u> means the game is over
>
> A loud buzzer means the game is <u>unintelligible</u>

but not:

> <u>Unintelligible</u> means <u>unintelligible</u>
>
> A loud buzzer <u>unintelligible</u>

Sometimes <u>that</u> is deleted and such deletion obscures the fact that you have a <u>dependent</u> clause. You have to be on the lookout for deleted <u>thats</u>:

> 'n when the game's over there'll be a loud
>
> (that) goes ehhhh.
>
> I wish (that) I had this game.

(In both cases, the second predicate is dependent on the previous word and the <u>that</u>, when put back in shows that dependency. In these cases, the <u>that</u> predicate clause is part of the t-unit).

The same thing happens less often with to:

I'll have to wait for you (to) turn it off, OK.

(Again, if you didn't realize the to was deleted, you might not recognize this as one t-unit).

That can also introduce a t-unit, in which case it does not refer to a specific word preceeding it, for example, That's your highest score yet.

If an utterance begins with because or cause, it can be an independent clause (which is a t-unit). For example, 'Because I want to get a 20' is scored as a t-unit. If because is in the middle of an utterance, it is a dependent clause and is included in the t-unit with the independent clause. For example, 'I am playing this game because I want to get a 20' is a 1 t-unit.

Sometimes, a t-unit is interrupted. If you have the subject and predicate, you count it as a t-unit even though it is clearly not finished.

The light's gonna go off in

Sometimes, particularly with a Black English speaker, you find a t-unit that is missing is. You count these as t-units:

Game over.

Words Excluded

Words excluded are words you underline that do not fit with the logic of the t-unit. Each of the underlined words are counted and that number put in the ____________#WE section on the code sheet. The remaining t-unit words are then counted and written in the __________#WT section.

We have not analyzed the different categories of words excluded but they are described here to operationalize the superordinate category.

Words Excluded in Introductory Phrases (WEIF)

Some examples are:

Oops, you're supposed to...

No, you're gonna...

Oh, that didn't...

Hah, yeah, ya got it in hand

uh, oh shit, it's stuck up there

See, I told you (When see is used to introduce a comment it is a WEIF)

Okay, now you can go

Well, here's how you do it

'Now' and 'here' are not words not excluded. For example, in Now there you go, and Here lemme try it, the 'Now' and 'Here' are not WEIF, they are adverbs.

Mazes or Tangles (WEM)

These are words in the middle of a t-unit that go off in a nonlogical direction and are then corrected.

So wait till it you see that....

False Starts (WEFS)

When there's a maze or false start containing "then", do not exclude it - include the then in the t-unit.

The light .... go ahead...

Audible Pauses (WEAP)

These are ums and uhs in the middle of a t-unit, Repeated Phrases (WERP)

Aim for my for my finger.

Incompleted Clause (WEIC)

If there is a subject and predicate, the incomplete clause is counted as a regular part of the t-unit, but if there is no subject and predicate, or just a subject or a predicate, it is a WEIC:

Like it helps me to stand sideways because

Pretty good don't start yet

Didn't work try it again.

Put a little spin on the ball...twenty!

Scoring Specific Structures

So far, you have read about how to mark the transcripts, with parentheses around the sequentially numbered t-units and the non t-units marked. You have also read about underlining and counting the words excluded and counting the remaining words to get the words in the t-unit count. We now turn to how we derive the count for the number of complex structures, or the total number of complexities located at the bottom of the scoring sheet.

The following directions are specifically designed for Bryan's coding system. They have been included to familiarize you with the nature of the clauses that we looked at.

On our sheets, we do not count individual types of clauses but total number of clauses per t-unit.

We count the total number of t-units; the number of t-units with more than one clause (complex - t-units) and derive a total number of clauses.

Each clause is then counted as <u>one</u> complexity.

_________CCAJ This is where you mark each dependent adjective or relative clause. They are usually introduced by <u>that</u>, <u>which</u>, or deleted <u>that</u>. <u>Because</u> clauses are also coded here.

_________CCAD This is where you mark each adverbial clause. These clauses are introduced by <u>how</u>, <u>where</u>, <u>when</u>, <u>till</u>, <u>until</u>, <u>whenever</u> and modify a verb.

_________CCN This is where you mark each noun clause which is a clause that takes the role of the subject or object ("What I want to say is...")

_________CCIF This is where you mark each <u>if</u> clause (<u>Whether</u> and <u>unless</u> are also included here).

_________CCM This is where you mark each main clause. This is the main subject and predicate and every t-unit will have one of these.

Remember that a clause must have a predicate. Each t-unit must have a main clause and none can have more than one main clause; thus each t-unit section will have the number 1 next to CCM.

<u>If</u> clauses are simple; they start with <u>if</u> (or <u>whether</u> and <u>unless</u>).

Adjective clauses are not so simple. However, they function as adjectives and thus modify a noun or pronoun. Examples: (We also code <u>because</u> clauses here).

Jus push it in <u>cause I did it too hard</u>.

There'll be a loud buzzer <u>that goes like ehhh</u>.

This group of clauses includes the that clauses.

Adverbial clauses are very common and are introduced by <u>when</u>, <u>until</u>, <u>till</u>, etc., (other adverbs). They modify verbs, adjectives, and other adverbs. Examples:

When the game's over, you'll here a loud buzzer.

Wait <u>till the light's off</u>.

Noun clauses are not common, but are interesting. They are nominals that function like a noun.

What you do serves as the subject of the whole t-unit;

What you do is you just try and aim in here.

And this is a noun clause.

Since we are not analyzing each separate category of clauses, you can view these definitions as operational terms of the category of clauses. But we have not completely finished with clauses, because ____________ CC or P (described later) is "You run in the lake and drown yourself.

The three parts at the bottom of the second column include coordinate structures, one of which is a clause. They are described next.

CC or P is your mark of a second clause in a t-unit if it is a coordinate sentence (See p.2). These are sentences with a main clause and an attached second clause with a deleted subject. You count the main clause one and the part______________CC or P one for the second clause in:

Ya gotta wait until this thing lights up and says the game's over.

(In this t-unit, the coordinate predicate is and says. The game's over functions as the object of the verb says and is a ______CCN, by the way.)

The only analysis we do of these clauses is to make a separate count of clauses and this count is actually part of the total count of______#C.

The next coordination is________CC or S which is a coordinate subject. There are no examples in the bowling game transcripts, but one would be: Jack and Jill went up the hill, where there are two subjects for one predicate.

The final coordination is the________CC or Oth which is for any repeated structures. An example of coordinated prepositions is:

I won if you move it in and out.

The last section on our scoring sheet includes specific structures within clauses. The first three are uncommon and quite advanced. We describe these first.

________COPa refers to passives. A passive is:

The man was hit on the head by the ugly old woman.

A passive that does not contain the agent (By the ugly old woman) would be -

The man was hit on the head.

________CONom refers to nominalizations. There are a few of these. A nominalization is when a verb or predicate part is changed to represent a noun and is then used as a noun. Some examples are:

> What you do is you stand like this. What you do is a noun clause, too, you will remember, but because the predicate is part of the function of a noun, in this case the sentence subject, it is also a nominalization. Double counting for these structures makes sense because of their sophistication linguistically. There were no other examples on the bowling game transcripts but some possibilities are: (and these are the classic nominalization types):
>
> Pleasing men is not my forte.
>
> The mending of socks is not something to look forward to.
>
> Paul's winning of the race was a surprise to us all.
>
> To buy a piano was Melanie's goal.

Appositive examples________COA; are few and far between, too. An appositive is an explanation of something right in the middle of a sentence, if you will. For example, the clause (it could be a phrase), who is Sally's grandmother, in the sentence:

That old lady, who is Sally's grandmother, makes the best cookies.

In this case, the <u>who</u> clause would be counted as an adjective clause and an appositive but if it were a phrase, it would not also be a clause, as in:

That mean old lady, (Sally's grandmother), steals cookies.

These three difficult structures are not analyzed in the system we have in any way except as just a count for the total count of complexities.

Below these three difficult structures are a number of very common items. They are first simply described, and following the description, there is some explanation and examples.

The third column includes specific structures within clauses:

(________C+AD) refers to adverbs - single ones

(________C+AJ) refers to adjectives

(________C+PP) refers to prepositional phrases

(________C+IN) refers to infinitives

(________C+TQ) refers to tag questions

(________C-Rel) refers to the deletion of <u>that</u> in relative clauses.

(________C-oth) refers to other deletions - such as subject in CC or P.

Adverbs are words like <u>now</u>, <u>again</u>, etc. They modify verbs, adverbs and adjectives. We include here words like <u>just</u>, too. Some of the numerous examples:

<u>Jus</u> take the ball

<u>Now</u> ya go

<u>Sometime</u> it comes <u>down</u> from the house <u>anyway</u>

Wait till the light goes <u>off</u> (We don't count the adverbial word at the beginning of an adverbial clause as a separate adverb so in this example <u>till</u> is not counted as C+AD)

In questions such as "Where is it? the where is not counted as an adverb. We count the word like as in "spin it like that" as an adverb.

Adjectives modify nouns and pronouns. There are fewer of these than adverbs in the bowling transcripts, possibly because of the nature of the task. Some examples:

There's a loud buzzer

That's good

Ya got 20 points

Ya might get a better score

We don't count that in prepositional phrases such as "to that side" as an adjective. We also do not score negatives, so in "there's no way," no is not scored as an adjective.

Prepositional phrases are easy to locate. In the house, etc. Some examples:

You should put some spin on it.

Spin it softer over about there.

The ball goes in down here.

Infinitives are verbals with to: to win, to play. The only problem in identifying infinitives is when the to part is attached to the preceding word as in gonna, wanna which mean going to and want to respectively (these count as two words by the way in counting words per t-unit).

You're supposed to roll it under here

I'll have to wait for you turn it off (turn is an infinitive because the to is understood).

You gotta wait until this thing lights up

In the sentence "Try 'n aim for the middle," 'n aim (which really means try to aim) is scored as an infinitive.

Tag questions come at the end of t-units. Note that we do not count these as separate clauses - they are included in the t-unit.

Examples:

> Your're supposed to shoot over there, I guess
>
> You like this game, don't you?
>
> Wait till the light goes off, 'kay?
>
> We're going to miss our math class you know
>
> We'll see the movie, won't we?

The OK's which come at the end of the sentences in the bowling game transcripts are counted as TQ, as are the see's which are occasionally attached to the ends of sentences. (Roll it over there like that, see). C-Rel is counted when there is a deleted that in a relative clause. There are not many examples, but you do find them. This deletion is a sign of sophistication, too.

> When you hear a buzzer that means the game's over.
>
> (That can be inserted between means and the).

C-oth are for other deletions, and are varied but not common in these transcripts. Some examples would include the subject deletion in coordinate predicates.

None of the structures PP, IN, TZ, Rel and other deletions are analyzed. They are simply counted for the total complexity score.

You get the total complexity score from adding all the counts under the heading of complexities.

The Ratio of linguistic complexity is calcuated by dividing the total number of complexities by the number of t-units.

Mean length of utterance was also calculated by dividing total number of words in t-units by the total number of t-units.

SCORE SHEET FOR LINGUISTIC ANALYSIS.

SUBJECT ______________________ (TO: __________________________) P

Y

WORDS TOTAL IN T-UNITS: _______________

WORDS EXCLUDED: _______________

WORDS TOTAL: _______________

WORDS EXCLUDED IN: Introductory Phrases _________________________

Mazes and Tangles _________________________

False Starts: _________________________

Audible Pauses: _________________________

Repeated Phrases: _________________________

Incomplete Clauses: _________________________

OF T-UNITS: _______________

OF COMPLEX T-UNITS: _______________

OF CLAUSES IN COMPLEX T-UNITS _______________

COMPLEXITIES:

# of Clauses: _________________________

# of passives: _________________________

# of nominalizations: _______________________

# of appositives: _________________________

# of adverbs: _________________________

# of adjectives: _________________________

# of prep. phrases: _________________________

# of infinitives: _________________________

# of tag Q's: ______________

# of deletions (that): ______________

# of other deletions: ______________

TOTAL # OF COMPLEXITIES: ______________

APPENDIX VII

Scoring Guide for Pragmatic Strategies

A total number of points for pragmatic strategies of planfulness is 40. Strategy points are only given for information conveyed to the time that Subjects and Partners begin playing the game. That is, cut off the trascript at the point marked G.S. (game started). This period is considered the 'instruction period'; the remaining time the 'game period'. The transcripts are scored according to three separate criteria:

A) Use of main idea labels as organizers: Main Ideation (10 points).

B) Inclusion of subordinate detail: Subordinate Ideation 15 points).

C) Presentation of information in a meaningful order: Sequencing (15 points).

A) Scoring Procedure for Main Ideation (same for Mancala and Helix Game)

Give two points for the first time the subject explicitly states the following: (Less explicit statements are given one point.)

1) Object or main object or main idea of the game (2 points) (the big idea....-1 point)

2. Introductory remarks about the game: For example: This is an old African stone game or - They used to play this in the sand with little rocks. (This is an old game - 1 point.)

3. Start; or this is how you begin the game (2 points).

4. Rules; or this is how you begin the game (2 points).

(This is how you play it or 'This is the way that you play it' - 1 point).

5. Finish; or End as in 'This is the way we finish the game'. (2 points).

B) Scoring Procedure.

Give one point for each subordinate idea of the game mentioned: possible 15 points total. Mark each idea as a I(Introductory) or O (Object); S (Start); R (Rule) or F (Finish) in a vertical column on the side of the transcript page.

For Mancala Game

1.	(old) African game	I
2.	as many pegs as possible in your large pit	O
3.	these pits (side of the board) is yours; mine	S
4.	large pit (Cala) this one is yours, this one mine	S
5.	two pegs in each pit	S
6.	take turns	S
7.	counter-clockwise direction	S
8.	all the pegs form one pit	R
9.	one peg into each next pit	R
10.	pick up from any pit	R
11.	left over pegs to opponent's side	R
12.	last peg in Cala - you get an extra turn	R
13.	when all the pits are empty	F
14.	count pegs in the Cala	F
15.	the one who has the most pegs wins	F
Total number of points possible		15

For the Helix game, give one point for presentation of each of the following subordinate ideas:

1.	Helix (this game is called Helix)	I
2.	like tic-tac-toe	I
3.	object - the object is to obtain lines (rows) of four or five)	O
4.	object is to block the other player	O
5.	take turns	S
6.	use 12 beads of one colour each.	S
7.	lines of beads along the bottom	R
8.	lines of beads straight up the pegs	R
9.	lines of beads in a step ladder	R
10.	lines of beads in a curve	R
11.	lines of beads straight across	R
12.	one point four beads in a line	F
13.	use up all the beads	F
14.	count the number of lines	F
15.	most points wins	F

C) Scoring Procedure

Procedure same for Mancala and Helix Game.

Using the order of subordinate ideas presented below as the 'optimum order' for sequencing, compare the order of the ideas presented by the Subject to this order. For each deviation from the optimum order, subtract one point from the total number of ideas presented by the Subject. (The total number of ideas presented will be the same as the score from B.) This will give the score for sequencing of ideas.

Total possible number of points is 15.

Example: Subject presented the following ideas in the following order:

I

O

S

S

R - 1 point

S

F

F

S - 1 point

---

7 points

Total Scores were calculated by adding the scores from A, B, and C, to a total possible of 40 points.

APPENDIX VIII

Procedure for Scoring Questionnaire Responses - Pragmatic Awareness

Question #1: When you are teaching somebody a game what do you think is the most important thing to do?

Here we are looking for responses that indicate that the subject is evaluating the process of teaching someone a game and judging whether the details or the main ideas or the approach is more important.

Thus,

- an answer indicating knowledge that planfulness in teaching a game includes:

  a) organization

  b) introduction of the main object of the game

  c) statement of the main parts of the game

  is given 3 points if the subjects mention these three items.

  2 points are given for the mention of two of these items and

  1 point is given for the mention of one of these items.

Question #2: Why?

In this question points are given for responses indicating that the subject is aware of the pragmatic value of planful behavior for effective communication.

Thus,

- 2 points are given for the expression of the idea of planfulness increasing the effectiveness of communication (for example: "So that the partner is better able to learn how to play the game.")
- 1 point is given for a less sophisticated response such as "so he can play the game"
- 0 points are given for a response reflecting no pragmatic awareness, such as "or they'll cheat and then you yell at them."

Question #3: (This question concerns the subject's self-evaluation and is not included in this analysis.)

Question #4: Why? (Do you think that you taught the game well/not so well etc.?)

Here we are looking for responses indicating that subjects are evaluating their own performance in terms of planfulness strategies.

Thus,

- 3 points are given for responses indicating that subjects are considering their performance in light of
  - a) organization
  - b) statement of object and
  - c) statement of main ideas.
- 2 points are given for self-evaluation in terms of two of these items.
- 1 point is given for self-evaluation in terms of one of these items

Question #5: If you were to teach the same partner another game what would you do differently to teach him/her better?

Again, we are looking for responses that indicate self-evaluation in terms of planfulness strategies. Here points are given for statements including the strategies of organization, statement of object of the game and the statement of the main ideas of the game.

Thus,

- 2 points are given for responses mentioning improvement in any of these areas (for example: "remember to tell her the object of the game").

- 1 point is given for responses that are less explicit but incorporate the same ideas or include less important but still strategic ideas. (for example: remember to tell him all the rules or tell him more about the origin of the game.)

Question #6: What kinds of things do you think you could say or do to help somebody learn this game better?

Here subjects are basically given yet another chance to evaluate their performance in terms of strategic behavior.

For a total of five possible points, responses are given one point for mention of the following ideas:

- statement of the object of the game
- statement of the main parts of the game
- statement of the subordinate ideas of the game
- usefulness of being organized or planful in the explanation of the game.

One point extra was given to subjects who included two or more of the above.

APPENDIX IX

Scoring Procedure for Self-evaluation of Performance Success (Questionnaire)

Subjects were asked to rate their performance on a five-point scale after completing the teaching and playing of the game.

Q. How well do you think that you taught the other child the game?

Really Well	Well	Alright	Not So Well	Really Poorly
5	4	3	2	1

Experimenter circled the response given by the Subject.

APPENDIX X

Scoring Procedure for Type of Locus of Control Response

Subjects responses to Question #4 - b on the questionnaire are judged as to whether they reflect internal or external locus of control beliefs. Question #4 - b concerns Why the subject thought that he had taught the game as well as (or as poorly as) he had indicated in Question #4 - a.

External type answers are those indicating that the Subject is judging his own performance in terms of external factors, such as the other child's performance on the game. Examples of External Type responses are:

"Because she won me", or

"Because she played really well."

Responses judged as Internal type are those indicating that the Subject is thinking about his own performance when rating his performance success.

Examples of Internal Type responses are:

"I remembered all the rules." or

"I didn't get all mixed up."

Type of Response is coded as 1 for Internal locus of control beliefs and as 2 for External locus of control beliefs.

APPENDIX XI

Table A

Linguistic Variables: 2 (Groups) x 2 (Partners) Analyses of Variance.[a]

Variable		Mean	S.D.	F	Df
1. Total Number of Words					
Group Main Effects				1.1850	1,43
	LD	289.567	96.256		
	N	319.667	97.527		
Partner Main Effects				6.8069 **	1,43
	P	283.822	83.413		
	Y	315.378	107.879		
Interaction					
	LD-P	271.433	81.632		
	-Y	307.733	107.266		
	N-P	306.600	84.125		
	-Y	330.733	111.189		
2. Words In T-Units					
Group Main Effects				2.3217	1,43
	LD	240.100	82.444		
	N	275.333	82.124		

a Groups: Learning Disabled (LD) n = 30   Partners: Peers (P)
Normals (N) n = 15   Youngers (Y)

* = p 0.05

** = p 0.01

Variable		Mean	S.D.	F	Df
2. Words In T-Units (cont'd)					
Partner Main Effects				6.9844 **	1,43
	P	237.289	73.503		
	Y	266.400	91.036		
Interaction				0.1192	1,43
	LD-P	224.200	73.293		
	-Y	256.000	89.070		
	N-P	263.467	68.928		
	-Y	287.200	94.433		
3. Total Number Of Excluded Words					
Group Main Effects				0.1795	1,43
	LD	47.667	30.429		
	N	44.233	24.168		
Partner Main Effects				2.4452	1,43
	P	43.578	23.904		
	Y	49.467	32.292		
Interaction				1.8730	1,43
	LD-P	42.900	22.798		
	LD-Y	52.433	36.291		
	N-P	44.933	26.792		
	N-Y	43.533	22.197		
4. Excluded Introductory Phrases					
Group Main Effects				0.1337	1,43
	LD	4.850	4.919		
	N	5.433	6.595		

Variable		Mean	S.D.	F	Df
4. Excluded Introductory Phrases (cont'd)					
Partner Main Effects				3.5610	1,43
	LD	5.689	5.510		
	N	4.400	5.483		
Interaction				1.1692	1,43
	LD-P	5.233	4.861		
	-Y	4.467	7.089		
	N-P	6.600	6.717		
	-Y	4.267	6.486		
5. Mazes					
Group Main Effects				0.2868	1,43
	LD	5.183	7.437		
	N	6.100	6.413		
Partner Main Effects				1.5222	1,43
	P	4.644	6.139		
	Y	6.333	7.906		
Interaction				1.3980	1,43
	LD-P	3.767	5.569		
	-Y	6.600	8.795		
	N-P	6.400	7.018		
	-Y	5.800	5.979		
6. False Starts					
Group Main Effects				0.5756	1,43
	LD	11.567	10.676		
	N	9.533	7.305		

Variable		Mean	S.D.	F	Df
6. False Starts (cont'd)					
Partner Main Effects				0.0773	1,43
	P	11.089	9.541		
	Y	10.689	9.938		
Interaction				1.8933	1,43
	LD-P	11.067	9.695		
	-Y	12.067	11.721		
	N-P	11.133	9.561		
	-Y	7.933	3.693		
7. Audible Pauses					
Group Main Effects				0.0256	1,43
	LD	8.567	4.799		
	N	8.800	6.077		
Partner Main Effects				2.9177	1,43
	P	8.000	5.317		
	Y	9.289	5.111		
Interaction				0.8396	1,43
	LD-P	8.167	5.187		
	-Y	8.967	4.429		
	N-P	7.667	5.740		
	-Y	9.933	6.386		
8. Repeated Phrases*					
Group Main Effects				1.2903	1,43
	LD	4.783	6.059		
	N	3.300	3.659		

Variable		Mean	S.D.	F	Df
8. Repeated Phrases* (cont'd)					
Partner Main Effects				6.9945 **	1,43
	P	3.000	3.989		
	Y	5.578	6.305		
Interaction				0.9047	1,43
	LD-P	3.167	4.364		
	-Y	6.400	7.089		
	N-P	2.667	3.222		
	-Y	3.933	4.061		
9. Incomplete Clauses					
Group Main Effects				0.1759	1,43
	LD	12.833	16.431		
	N	10.967	12.530		
Partner Main Effects				0.0735	1,43
	P	11.956	12.861		
	Y	12.467	17.365		
Interaction				0.0011	1,43
	LD-P	12.600	13.278		
	-Y	13.067	19.309		
	N-P	10.667	12.327		
	-Y	11.267	13.155		
10. Number Of T-Units*					
Group Main Effects				0.4310	1,43
	LD	36.017	13.733		
	N	38.600	14.095		

Variable		Mean	S.D.	F	Df
10. Number of T-Units* (cont'd)					
Partner Main Effects				6.0659 *	1,43
	P	34.667	12.696		
	Y	39.089	14.686		
Interaction				0.1839	1,43
	LD-P	33.533	12.921		
	-Y	38.500	14.282		
	N-P	36.933	12.349		
	-Y	40.267	15.908		
11. Number Of Complex T-Units					
Group Main Effects				0.8512	1,43
	LD	6.100	3.438		
	N	6.867	3.159		
Partner Main Effects				0.9775	1,43
	P	6.044	3.364		
	Y	6.667	3.344		
Interaction				0.1222	1,43
	LD-P	5.867	3.702		
	-Y	6.333	3.198		
	N-P	6.400	2.640		
	-Y	7.333	3.638		
12. Number Of Clauses In Complex T-Units					
Group Main Effects				0.9626	1,43
	LD	13.383	7.397		
	N	15.200	7.406		

Variable		Mean	S.D.	F	Df
12. <u>Number Of Clauses In Complex T-Units</u> (cont'd)					
Partner Main Effects				0.2171	1,43
	P	13.667	7.450		
	Y	14.311	7.437		
Interaction				0.2386	1,43
	LD-P	13.300	7.996		
	-Y	13.467	6.882		
	N-P	14.400	6.412		
	-Y	16.000	8.435		
13. <u>Total Number Of Clauses</u>					
Group Main Effects				0.6687	1,43
	LD	43.286	15.777		
	N	46.967	15.260		
Partner Main Effects				5.3931*	1,43
	P	42.289	14.492		
	Y	46.733	16.532		
Interaction				0.0357	1,43
	LD-P	40.933	15.240		
	-Y	45.633	16.209		
	N-P	45.000	12.928		
	-Y	48.933	17.519		
14. <u>Total Number Of Complexities</u>					
Group Main Effects				2.0455	1,43
	LD	115.733	39.910		
	N	131.400	40.428		

Variable		Mean	S.D.	F	Df
14. Total Number Of Complexities (cont'd)					
Partner Main Effects				7.2007 **	1,43
	P	113.156	35.402		
	Y	128.756	44.122		
Interaction				0.0066	1,43
	LD-P	107.767	33.874		
	-Y	123.700	44.291		
	N-P	123.933	37.088		
	-Y	138.867	43.480		
15. Passives					
Group Main Effects					
	LD	0.	0.		
	N	0.	0.		
Partner Main Effects					
	P	0.	0.		
	Y	0.	0.		
Interaction					
	LD-P	0.	0.		
	-Y	0.	0.		
	N-P	0.	0.		
	-Y	0.	0.		
16. Nominalizations					
Group Main Effects				0.0452	1,43
	LD	0.083	0.279		
	N	0.100	0.403		

Variable		Mean	S.D.	F	Df
16. Nominalizations (cont'd)					
Partner Main Effects				0.4838	1,43
	P	0.067	0.252		
	Y	0.111	0.383		
Interaction				0.0605	1,43
	LD-P	0.067	0.254		
	-Y	0.100	0.305		
	N-P	0.067	0.258		
	-Y	0.133	0.516		
17. Appositives					
Group Main Effects				0.1392	1,43
	LD	0.100	0.399		
	N	0.133	0.346		
Partner Main Effects				0.3258	1,43
	P	0.089	0.358		
	Y	0.133	0.405		
Interaction				0.6515	1,43
	LD-P	0.100	0.403		
	-Y	0.100	0.403		
	N-P	0.067	0.258		
	-Y	0.200	0.414		
18. Adverbs*					
Group Main Effects				0.0254	1,43
	LD	25.650	12.505		
	N	26.233	14.498		

Variable		Mean	S.D.	F	Df
18. Adverbs (cont'd)					
Partner Main Effects				6.4793*	1,43
	P	23.489	11.043		
	Y	28.200	14.665		
Interaction				0.0451	1,43
	LD-P	23.433	10.411		
	-Y	27.867	14.127		
	N-P	23.600	12.597		
	-Y	28.867	16.181		
19. Adjectives					
Group Main Effects				5.8899*	1,43
	LD	21.050	8.642		
	N	26.600	9.697		
Partner Main Effects				1.1248	1,43
	P	22.044	9.010		
	Y	23.756	9.668		
Interaction				0.8925	1,43
	LD-P	20.733	7.887		
	-Y	21.367	9.463		
	N-P	24.667	10.735		
	-Y	28.533	8.459		
20. Prepositional Phrases					
Group Main Effects				4.4106*	1,43
	LD	13.967	7.328		
	N	18.467	7.807		

Variable		Mean	S.D.	F	Df
20. Prepositional Phrases (cont'd)					
Partner Main Effects				9.1002	1,43
	P	14.089	7.173		
	Y	16.844	8.127		
Interaction				0.4735	1,43
	LD-P	12.367	6.505		
	-Y	15.567	7.851		
	N-P	17.533	7.415		
	-Y	19.400	8.331		
21. Infinitives					
Group Main Effects				0.0665	1,43
	LD	6.697	4.345		
	N	6.667	4.737		
Partner Main Effects				0.0287	1,43
	P	6.800	4.610		
	Y	6.933	4.345		
Interaction				0.0574	1,43
	LD-P	6.967	4.590		
	-Y	6.967	4.165		
	N-P	6.467	4.794		
	-Y	6.867	4.838		
22. Tag Questions					
Group Main Effects				11.7682**	1,43
	LD	1.067	1.604		
	N	2.533	1.943		

Variable		Mean	S.D.	F	Df
22. Tag Questions (cont'd)					
Partner Main Effects				1.5418	1,43
	P	1.356	1.667		
	Y	1.756	2.013		
Interaction				0.0000	1,43
	LD-P	0.867	1.196		
	-Y	1.267	1.929		
	N-P	2.333	2.059		
	-Y	2.733	1.870		
23. Deleted: Thats					
Group Main Effects				0.1367	1,43
	LD	2.183	2.054		
	N	2.000	1.722		
Partner Main Effects				0.8917	1,43
	P	1.956	1.651		
	Y	2.289	2.201		
Interaction				0.1605	1,43
	LD-P	1.967	1.732		
	-Y	2.400	2.343		
	N-P	1.933	1.543		
	-Y	2.067	1.944		
24. Other Deletions					
Group Main Effects				0.1787	1,43
	LD	2.400	2.352		
	N	2.167	2.102		

Variable		Mean	S.D.	F	Df
24. Other Deletions (cont'd)					
Partner Main Effects				0.9283	1,43
	P	2.111	1.824		
	Y	2.533	2.634		
Interaction				0.6223	1,43
	LD-P	2.067	1.660		
	-Y	2.733	2.876		
	N-P	2.200	2.178		
	-Y	2.133	2.100		
25. Ratio Of Complexity					
Group Main Effects				1.2270	1,43
	LD	3.335	.639		
	N	3.511	.517		
Partner Main Effects				0.1225	1,43
	P	3.411	.633		
	Y	3.376	.579		
Interaction				2.4258	1,43
	LD-P	3.408	.699		
	-Y	3.263	.575		
	N-P	3.419	.500		
	-Y	3.603	.534		

Table B

Trained And Untrained Learning - Disabled Groups With Peer And Younger Partners On Pre And Post-test Measures On Linguistic Variables

Variable	Mean	S.D.	F	Df
1. Words Total				
Groups			2.1855	1,28
Trained	303.017	(94.373)		
Untrained	262.717	(91.491)		
Partners			6.0197*	1,84
Peers	268.883	(93.881)		
Youngers	296.850	(94.295)		
Groups X Partners			3.3942	1,84
Trained X Peers	278.533	88.843		
Trained X Youngers	327.500	94.797		
Untrained X Peers	259.233	99.224		
Untrained X Youngers	366.200	84.614		
Measures			1.3820	1,84
Pre	289.567	96.256		
Post	276.167	93.521		
Groups X Measures			4.2504*	1,84
Trained X Pre	321.467	103.886		
X Post	284.567	81.382		
Untrained X Pre	257.667	77.152		
X Post	267.767	104.999		
Partners X Measures			0.5302	1,84
Peers X Pre	271.433	81.632		
Peers X Post	266.333	106.084		
Youngers X Pre	307.700	107.266		
Youngers X Post	286.000	79.624		

Variable	Mean	S.D.	F	Df
1. Words Total (cont'd)				
Groups X Partners X Measures			1.7938	1,84
Trained X Peers X Pre	285.200	93.376		
Trained X Peers X Post	271.867	86.808		
Trained X Youngers X Pre	357.733	104.010		
Trained X Youngers X Post	297.267	76.407		
Untrained X Peers X Pre	257.667	68.398		
Untrained X Peers X Post	260.800	125.341		
Untrained X Youngers X Pre	257.667	87.474		
Untrained X Youngers X Post	274.733	83.802		
2. Words In T-Units				
Groups			4.1870*	1,28
Trained	258.317	(81.100)		
Untrained	213.283	(73.143)		
Partners			6.4129*	1,84
Peers	223.483	(79.303)		
Youngers	248.117	(79.755)		
Groups X Partners			3.3988	1,84
Trained X Peers	237.033	(77.362)		
Trained X Youngers	279.600	(80.368)		
Untrained X Peers	209.933	(80.187)		
Untrained X Youngers	216.633	(66.568)		

Variable	Mean	S.D.	F	Df
2. Words In T-Units (cont'd)				
Measures			0.7816	1,84
Pre	240.100	(82.444)		
Post	231.500	(78.254)		
Groups X Measures			8.3054*	1,84
Trained X Pre	276.633	(88.084)		
X Post	240.000	(70.202)		
Untrained X Pre	203.567	(57.518)		
X Post	223.000	(85.911)		
Partners X Measures			0.5428	1,84
Peers X Pre	224.200	(73.293)		
Peers X Post	222.767	(86.150)		
Youngers X Pre	256.000	(89.070)		
Youngers X Post	240.233	(69.849)		
Groups X Partners X Measures			1.1285	1,84
Trained X Peers X Pre	246.600	(84.388)		
Trained X Peers X Post	227.467	(71.274)		
Trained X Youngers X Pre	306.667	(83.771)		
Trained X Youngers X Post	252.533	(69.224)		
Untrained X Peers X Pre	201.800	(54.139)		
Untrained X Peers X Post	218.067	(101.224)		
Untrained X Youngers X Pre	205.333	(62.572		
Untrained X Youngers X Post	227.933	(70.641)		

Variable	Mean	S.D.	F	Df
3. <u>Words Excluded In Total</u>				
Groups			0.2818	1,28
Trained	43.833	22.062		
Untrained	47.767	30.538		
Partners			1.9031	1,84
Peers	43.233	23.479		
Youngers	48.367	29.368		
Groups X Partners			0.1698	1,84
Trained X Peers	40.500	21.336		
Trained X Youngers	47.167	22.628		
Untrained X Peers	45.967	25.512		
Untrained X Youngers	49.567	35.210		
Measures			1.0066	1,84
Pre	47.667	30.429		
Post	43.933	22.230		
Groups X Measures			0.3710	1,84
Trained X Pre	44.567	24.647		
X Post	43.100	19.537		
Untrained X Pre	50.767	35.447		
X Post	44.767	24.945		
Partners X Measures			1,3982	1,84
Peers X Pre	42.900	22.798		
Peers X Post	45.537	24.527		
Youngers X Pre	52.433	36.291		
Youngers X Post	44.300	20.088		

Variable	Mean	S.D.	F	Df
3. Words Excluded In Total (cont'd)				
Groups X Partners X Measures			1.7105	1,84
Trained X Peers X Pre	36.600	20.042		
Trained X Peers X Post	44.400	22.554		
Trained X Youngers X Pre	52.533	26.843		
Trained X Youngers X Post	41.800	16.683		
Untrained X Peers X Pre	49.200	24.288		
Untrained X Peers X Post	42.733	27.128		
Untrained X Youngers X Pre	52.333	44.805		
Untrained X Youngers X Post	46.800	23.327		
4. Excluded Introductory Phrases				
Groups			0.9891	1,28
Trained	4.150	(4.715)		
Untrained	5.333	(4.328)		
Partners			0.3144	1,84
Peers	4.933	(4.654)		
Youngers	4.500	(4.466)		
Groups X Partners			1.9311	1,84
Trained X Peers	3.867	(4.313)		
Trained X Youngers	4.433	(5.144)		
Untrained X Peers	6.000	(4.807)		
Untrained X Youngers	4.667	(3.754)		

Variable	Mean	S.D.	F	Df
4. Excluded Introductory Phrases (cont'd)				
Measures			0.1004	1,84
Pre	4.850	(4.919)		
Post	4.633	(4.178)		
Groups X Measures			0.2621	1,84
Trained X Pre	4.433	(5.853)		
X Post	3.867	(3.288)		
Untrained X Pre	5.267	(3.823)		
X Post	5.400	(4.847)		
Partners X Measures			0.3144	1,84
Peers X Pre	5.233	(4.861)		
Peers X Post	4.633	(4.499)		
Youngers X Pre	4.467	(5.029)		
Youngers X Post	4.633	(3.908)		
Groups X Partners X Measures			0.6473	1,84
Trained X Peers X Pre	4.067	(5.147)		
Trained X Peers X Post	3.667	(3.457)		
Trained X Youngers X Pre	4.800	(6.646)		
Trained X Youngers X Post	4.067	(3.218)		
Untrained X Peers X Pre	6.400	(4.421)		
Untrained X Peers X Post	5.600	(5.289)		
Untrained X Youngers X Pre	4.133	(2.825)		
Untrained X Youngers X Post	5.200	(4.539)		

Variable	Mean	S.D.	F	Df
5. Excluded Mazes				
Groups			0.2131	1,28
Trained	6.117	(9.007)		
Untrained	5.283	(6.745)		
Partners			0.8340	1,84
Peers	5.117	(8.166)		
Youngers	6.283	(7.720)		
Groups X Partners			6.8083 *	1,84
Trained X Peers	3.867	(9.280)		
Trained X Youngers	8.367	(8.273)		
Untrained X Peers	6.367	(6.805)		
Untrained X Youngers	4.200	(6.620)		
Measures			0.6543	1,84
Pre	5.183	(7.437)		
Post	6.217	(8.433)		
Groups X Measures			2.6171	1,84
Trained X Pre	4.567	(7.664)		
X Post	7.667	10.066		
Untrained X Pre	5.800	7.820		
X Post	4.767	6.246		
Partners X Measures			1.7021	1,84
Peers X Pre	3.767	5.569		
Peers X Post	6.467	10.044		
Youngers X Pre	6.600	8.795		
Youngers X Post	5.967	6.610		

Variable	Mean	S.D.	F	Df
5. <u>Excluded Mazes</u> (cont'd.)				
Groups X Partners X Measures			0.0551	1,84
Trained X Peers X Pre	1.333	1.915		
Trained X Peers X Post	6.400	12.687		
Trained X Youngers X Pre	7.800	9.778		
Trained X Youngers X Post	8.933	6.745		
Untrained X Peers X Pre	6.200	6.920		
Untrained X Peers X Post	6.533	(6.927)		
Untrained X Youngers X Pre	5.400	(7.845)		
Untrained X Youngers X Post	3.000	(5.113)		
6. <u>Excluded False Starts</u>				
Groups			0.3223	1,28
Trained	10.967	10.575		
Untrained	9.517	10.817		
Partners			0.5679	1,84
Peers	10.883	10.992		
Youngers	9.600	10.404		
Groups X Partners			1,8506	1,84
Trained X Peers	12.767	11.895		
Trained X Youngers	9.167	8.906		
Untrained X Peers	9.000	9.847		
Untrained X Youngers	10.033	11.854		

Variable	Mean	S.D.	F	Df
6. <u>Excluded False Starts</u> (cont'd)				
Measures			2.4214	1,84
Pre	11.567	10.676		
Post	8.917	10.599		
Groups X Measures			0.0162	1,84
Trained X Pre	12.400	10.102		
X Post	9.533	11.010		
Untrained X Pre	10.733	11.332		
X Post	8.300	10.323		
Partners X Measures			1.7977	1,84
Peers X Pre	11.067	9.695		
Peers X Post	10.700	12.318		
Youngers X Pre	12.067	11.721		
Youngers X Post	7.133	8.382		
Groups X Partners X Measures			1,5448	1,84
Trained X Peers X Pre	12.000	9.776		
Trained X Peers X Post	13.533	14.010		
Trained X Youngers X Pre	12.800	10.745		
Trained X Youngers X Post	5.533	4.533		
Untrained X Peers X Pre	10.133	9.862		
Untrained X Peers X Post	7.867	10.042		
Untrained X Youngers X Pre	11.333	12.900		
Untrained X Youngers X Post	8.733	10.931		

Variable	Mean	S.D.	F	Df
7. <u>Excluded Audible Pauses</u>				
Groups			0.0101	1,28
Trained	8.233	5.273		
Untrained	8.100	4.418		
Partners			0.6341	1,84
Peers	7.883	4.917		
Youngers	8.450	4.796		
Groups X Partners			0.2655	1,84
Trained X Peers	7.767	5.015		
Trained X Youngers	8.200	5.566		
Untrained X Peers	8.000	4.899		
Untrained X Youngers	8.200	3.960		
Measures			1.2638	1,84
Pre	8.567	4.797		
Post	7.[illegible]67	4.897		
Groups X Measures			0.0790	1,84
Trained X Pre	8.533	5.257		
X Post	7.933	5.362		
Untrained X Pre	8.600	4.383		
X Post	7.600	4.469		
Partners X Measures			0.1075	1,84
Peers X Pre	8.167	5.187		
Peers X Post	7.600	4.702		
Youngers X Pre	8.967	4.429		
Youngers X Post	7.933	5.159		

Variable	Mean	S.D.	F	Df
7. Excluded Audible Pauses (cont'd)				
Groups X Partners X Measures			0.3708	1,84
Trained X Peers X Pre	7.733	5.675		
Trained X Peers X Post	7.800	4.459		
Trained X Youngers X Pre	9.333	4.865		
Trained X Youngers X Post	8.067	6.296		
Untrained X Peers X Pre	8.600	4.808		
Untrained X Peers X Post	7.400	5.082		
Untrained X Youngers X Pre	8.600	4.085		
Untrained X Youngers X Post	7.800	3.932		
8. Excluded Repeated Phrases				
Groups			0.2944	1,28
Trained	4.600	5.791		
Untrained	3.983	4.564		
Partners			5.2232 *	1,84
Peers	3.350	3.965		
Youngers	5.233	6.085		
Groups X Partners			7.4550**	1,84
Trained X Peers	2.533	2.991		
Trained X Youngers	6.667	7.102		
Untrained X Peers	4.167	4.654		
Untrained X Youngers	3.800	4.544		

Variable	Mean	S.D.	F	Df
8. Excluded Repeated Phrases (cont'd)				
Measures			1.4239	1,84
Pre	4.783	6.059		
Post	3.800	4.165		
Groups X Measures			3.2401	1,84
Trained X Pre	5.833	7.216		
X Post	3.367	3.605		
Untrained X Pre	3.733	4.510		
X Post	4.233	4.681		
Partners X Measures			2.6838	1,84
Peers X Pre	3.167	4.364		
Peers X Post	3.533	3.589		
Youngers X Pre	6.400	7.089		
Youngers X Post	4.067	4.719		
Groups X Partners X Measures			0.1477	1,84
Trained X Peers X Pre	2.933	3.474		
Trained X Peers X Post	2.133	2.475		
Trained X Youngers X Pre	8.733	8.819		
Trained X Youngers X Post	4.600	4.188		
Untrained X Peers X Pre	3.400	5.221		
Untrained X Peers X Post	4.933	4.044		
Untrained X Youngers X Pre	4.067	3.826		
Untrained X Youngers X Post	3.533	5.290		

Variable	Mean	S.D.	F	Df
9. Excluded Incomplete Clauses				
Groups			0.6324	1,28
Trained	11.733	11.211		
Untrained	14.900	17.700		
Partners			1.3681	1,84
Peers	12.033	11.846		
Youngers	14.600	17.404		
Groups X Partners			0.1941	1,84
Trained X Peers	10.933	9.720		
Trained X Youngers	12.533	12.646		
Untrained X Peers	13.133	13.731		
Untrained X Youngers	16.667	21.154		
Measures			0.1941	1,84
Pre	12.833	16.431		
Post	13.800	13.271		
Groups X Measures			1.3681	1,84
Trained X Pre	9.967	9.866		
X Post	13.500	12.325		
Untrained X Pre	15.700	20.854		
X Post	14.100	14.361		
Partners X Measures			0.9159	1,84
Peers X Pre	12.600	13.278		
Peers X Post	11.467	10.418		
Youngers X Pre	13.067	19.309		
Youngers X Post	16.133	15.445		

Variable	Mean	S.D.	F	Df
9. Excluded Incomplete Clauses (cont'd)				
Groups X Partners X Measures			0.0067	1,84
Trained X Peers X Pre	9.333	8.795		
Trained X Peers X Post	11.933	10.780		
Trained X Youngers X Pre	10.000	11.148		
Trained X Youngers X Post	15.067	13.900		
Untrained X Peers X Pre	15.267	16.512		
Untrained X Peers X Post	11.000	10.399		
Untrained X Youngers X Pre	16.133	25.057		
Untrained X Youngers X Post	17.200	17.276		
10. Number Of T-Units				
Groups			1.7477	1,28
Trained	36.867	13.033		
Untrained	32.383	11.117		
Partners			6.7824 *	1,84
Peers	32.650	12.118		
Youngers	36.600	12.208		
Groups X Partners			0.7536	1,84
Trained X Peers	34.233	12.428		
Trained X Youngers	39.500	13.294		
Untrained X Peers	31.067	11.794		
Untrained X Youngers	33.700	10.429		

Variable	Mean	S.D.	F	Df
10. Number Of T-Units (cont'd)				
Measures			3.3676	1,84
Pre	36.017	13.733		
Post	33.223	10.542		
Groups X Measures			11.8297**	1,84
Trained X Pre	40.867	14.529		
X Post	32.867	10.068		
Untrained X Pre	31.167	11.133		
X Post	33.600	11.156		
Partners X Measures			0.4493	1,84
Peers X Pre	33.533	12.921		
Peers X Post	31.767	11.410		
Youngers X Pre	38.500	14.282		
Youngers X Post	34.700	9.563		
Groups X Partners X Measures			3.6979	1,84
Trained X Peers X Pre	36.267	13.849		
Trained X Peers X Post	32.200	10.923		
Trained X Youngers X Pre	45.467	14.147		
Trained X Youngers X Post	33.533	9.471		
Untrained X Peers X Pre	30.800	11.749		
Untrained X Peers X Post	31.333	12.246		
Untrained X Youngers X Pre	31.533	10.882		
Untrained X Youngers X Post	35.867	9.841		

Variable	Mean	S.D.	F	Df
11. Number Of Complex T-Units				
Groups			3.4823	1,28
Trained	6.367	3.360		
Untrained	5.067	2.773		
Partners			2.3007	1,84
Peers	5.333	3.282		
Youngers	6.100	2.961		
Groups X Partners			3.1705	1,84
Trained X Peers	5.533	3.491		
Trained X Youngers	7.200	3.056		
Untrained X Peers	5.133	3.104		
Untrained X Youngers	5.000	2.449		
Measures			2.3007	1,84
Pre	6.100	3.438		
Post	5.333	2.778		
Groups X Measures			0.7350	1,84
Trained X Pre	6.967	3.882		
X Post	5.767	2.674		
Untrained X Pre	5.233	2.725		
X Post	4.900	2.857		
Partners X Measures			0.3523	1,84
Peers X Pre	5.867	3.702		
Peers X Post	4.800	2.759		
Youngers X Pre	6.333	3.198		
Youngers X Post	5.867	2.738		

Variable	Mean	S.D.	F	Df
11. Number Of Complex T-Units (cont'd)				
Groups X Partners X Measures			0.0391	1,84
Trained X Peers X Pre	6.333	4.499		
Trained X Peers X Post	4.733	1.907		
Trained X Youngers X Pre	7.600	3.180		
Trained X Youngers X Post	6.800	2.981		
Untrained X Peers X Pre	5.400	2.772		
Untrained X Peers X Post	4.867	3.482		
Untrained X Youngers X Pre	5.067	2.764		
Untrained X Youngers X Post	4.933	2.187		
12. Number Of Clauses In Complex T-Units				
Groups			4.2606*	1,28
Trained	14.117	(7.531)		
Untrained	10.950	(5.924)		
Partners			1.3657	1,84
Peers	11.883	7.145		
Youngers	13.183	6.708		
Groups X Partners			3.2325	1,84
Trained X Peers	12.467	7.794		
Trained X Youngers	15.767	7.001		
Untrained X Peers	11.300	6.513		
Untrained X Youngers	10.600	5.360		

Variable	Mean	S.D.	F	Df
12. <u>Number Of Clauses In Complex T-Units</u> (cont'd)				
Measures			2.3355	1,84
Pre	13.383	7.397		
Post	11.683	6.382		
Groups X Measures			0.4346	1,84
Trained X Pre	15.333	8.243		
X Post	12.900	6.661		
Untrained X Pre	11.433	5.958		
X Post	10.467	5.952		
Partners X Measures			1.0380	1,84
Peers X Pre	13.300	7.996		
Peers X Post	10.467	5.981		
Youngers X Pre	13.467	6.882		
Youngers X Post	12.900	6.385		
Groups X Partners X Measures			0.2595	1,84
Trained X Peers X Pre	14.533	9.680		
Trained X Peers X Post	10.400	4.793		
Trained X Youngers X Pre	16.133	6.760		
Trained X Youngers X Post	15.400	7.453		
Untrained X Peers X Pre	12.067	5.958		
Untrained X Peers X Post	10.533	7.150		
Untrained X Youngers X Pre	10.800	6.097		
Untrained X Youngers X Post	10.400	4.718		

Variable	Mean	S.D.	F	Df
13. Total Number Of Clauses				
Groups			2.3699	1,28
Trained	44.133	14.597		
Untrained	38.250	12.612		
Partners			6.6766*	1,84
Peers	39.017	14.148		
Youngers	43.367	13.415		
Groups X Partners			1.1221	1,84
Trained X Peers	41.067	14.463		
Trained X Youngers	47.200	14.313		
Untrained X Peers	36.967	13.760		
Untrained X Youngers	39.533	11.440		
Measures			6.1748 *	1,84
Pre	43.283	15.777		
Post	39.100	11.486		
Groups X Measures			13.0574 **	1,84
Trained X Pre	49.267	16.793		
X Post	39.000	9.847		
Untrained X Pre	37.300	12.262		
X Post	39.200	13.092		
Partners X Measures			0.0432	1,84
Peers X Pre	40.933	15.240		
Peers X Post	37.100	12.936		
Youngers X Pre	45.633	16.209		
Youngers X Post	41.100	9.632		

Variable	Mean	S.D.	F	Df
13. Total Number Of Clauses (cont'd)				
Groups X Partners X Measures			2.8657	1,84
Trained X Peers X Pre	44.600	17.154		
Trained X Peers X Post	37.533	10.596		
Trained X Youngers X Pre	53.933	15.595		
Trained X Youngers X Post	40.467	9.164		
Untrained X Peers X Pre	37.267	12.572		
Untrained X Peers X Post	36.667	15.296		
Untrained X Youngers X Pre	37.333	12.385		
Untrained X Youngers X Post	41.733	10.361		
14. Total Number Of Complexities				
Groups			5.4558*	1,28
Trained	123.067	38.419		
Untrained	101.400	31.699		
Partners			6.7751*	1,84
Peers	105.917	35.295		
Youngers	118.550	37.319		
Groups X Partners			3.7776	1,84
Trained X Peers	112.033	35.600		
Trained X Youngers	134.100	38.519		
Untrained X Peers	99.800	34.492		
Untrained X Youngers	103.000	29.144		

Variable	Mean	S.D.	F	Df
14. Total Number Of Complexities (cont'd)				
Measures			2.0801	1,84
Pre	115.733	39.910		
Post	108.733	33.195		
Groups X Measures			6.5272*	1,84
Trained X Pre	132.767	45.229		
X Post	113.367	27.615		
Untrained X Pre	98.700	24.382		
X Post	104.100	37.879		
Partners X Measures			0.4623	1,84
Peers X Pre	107.767	33.874		
Peers X Post	104.067	37.147		
Youngers X Pre	123.700	44.291		
Youngers X Post	113.400	28.580		
Groups X Partners X Measures			1.2226	1,84
Trained X Peers X Pre	117.400	41.703		
Trained X Peers X Post	106.667	28.712		
Trained X Youngers X Pre	148.133	44.636		
Trained X Youngers X Post	120.067	25.672		
Untrained X Peers X Pre	98.133	20.948		
Untrained X Peers X Post	101.467	44.939		
Untrained X Youngers X Pre	99.267	28.141		
Untrained X Youngers X Post	106.733	30.621		

Variable	Mean	S.D.	F	Df
15. Passives		- Nil Scores -		
16. Nominalizations				
Groups			6.5172*	1,28
Trained	0.150	0.404		
Untrained	0.000	0.000		
Partners			0.1045	1,84
Peers	0.067	0.252		
Youngers	0.083	0.334		
Groups X Partners			0.1045	1,84
Trained X Peers	0.133	0.346		
Trained X Youngers	0.167	0.461		
Untrained X Peers	0.000	0.000		
Untrained X Youngers	0.000	0.000		
Measures			0.1045	1,84
Pre	0.083	0.279		
Post	0.067	0.312		
Groups X Measures			0.1045	1,84
Trained X Pre	0.167	0.379		
X Post	0.133	0.434		
Untrained X Pre	0.000	0.000		
X Post	0.000	0.000		
Partners X Measures			0.1045	1,84
Peers X Pre	0.067	0.254		
Peers X Post	0.067	0.254		
Youngers X Pre	0.100	0.305		
Youngers X Post	0.067	0.365		

Variable	Mean	S.D.	F	Df
16. Nominalizations (cont'd)				
Groups X Partners X Measures			0.1045	1,84
Trained X Peers X Pre	0.133	0.352		
Trained X Peers X Post	0.133	0.352		
Trained X Youngers X Pre	0.200	0.414		
Trained X Youngers X Post	0.133	0.516		
Untrained X Peers X Pre	0.000	0.000		
Untrained X Peers X Post	0.000	0.000		
Untrained X Youngers X Pre	0.000	0.000		
Untrained X Youngers X Post	0.000	0.000		
17. Appositives				
Groups			9.7439 *	1,28
Trained	0.433	0.851		
Untrained	0.017	0.129		
Partners			2.6129	1,84
Peers	0.150	0.444		
Youngers	0.300	0.788		
Groups X Partners			3.9032 *	1,84
Trained X Peers	0.267	0.583		
Trained X Youngers	0.600	1.037		
Untrained X Peers	0.033	0.183		
Untrained X Youngers	0.000	0.000		

Variable	Mean	S.D.	F	Df
17. Appositives (cont'd)				
Measures			7.2581**	1,84
Pre	0.100	0.399		
Post	0.350	0.799		
Groups X Measures			9.3226**	1,84
Trained X Pre	0.167	0.531		
X Post	0.700	1.022		
Untrained X Pre	0.033	0.183		
X Post	0.000	0.000		
Partners X Measures			2.6129	1,84
Peers X Pre	0.100	0.403		
Peers X Post	0.200	0.484		
Youngers X Pre	0.100	0.403		
Youngers X Post	0.500	1.009		
Groups X Partners X Measures			1.5806	1,84
Trained X Peers X Pre	0.133	0.516		
Trained X Peers X Post	0.400	0.632		
Trained X Youngers X Pre	0.200	0.561		
Trained X Youngers X Post	1.000	1.254		
Untrained X Peers X Pre	0.067	0.258		
Untrained X Peers X Post	0.000	0.000		
Untrained X Youngers X Pre	0.000	0.000		
Untrained X Youngers X Post	0.000	0.000		

Variable	Mean	S.D.	F	Df
18. Adverbs				
Groups			0.7974	1,28
Trained	24.617	12.347		
Untrained	22.033	10.292		
Partners			2.8880	1,84
Peers	21.950	10.516		
Youngers	24.700	12.138		
Groups X Partners			3.9513*	1,84
Trained X Peers	21.633	10.247		
Trained X Youngers	27.600	13.665		
Untrained X Peers	22.267	10.945		
Untrained X Youngers	21.800	9.778		
Measures			8.2573**	1,84
Pre	25.650	12.505		
Post	21.000	9.716		
Groups X Measures			4.0337*	1,84
Trained X Pre	28.567	13.960		
X Post	20.667	9.110		
Untrained X Pre	22.733	10.279		
X Post	21.333	10.433		
Partners X Measures			1.0821	1,84
Peers X Pre	23.433	10.411		
Peers X Post	20.467	10.585		
Youngers X Pre	27.867	14.127		
Youngers X Post	21.533	8.912		

Variable	Mean	S.D.	F	Df
18. Adverbs (cont'd)				
Groups X Partners X Measures			0.3447	1,84
Trained X Peers X Pre	24.267	11.423		
Trained X Peers X Post	19.000	8.494		
Trained X Youngers X Pre	32.867	15.282		
Trained X Youngers X Post	22.333	9.686		
Untrained X Peers X Pre	22.600	9.620		
Untrained X Peers X Post	21.933	12.464		
Untrained X Youngers X Pre	22.867	11.237		
Untrained X Youngers X Post	20.733	8.328		
19. Adjectives				
Groups			5.6678*	1,28
Trained	24.450	8.998		
Untrained	19.100	8.094		
Partners			1.5376	1,84
Peers	20.983	8.160		
Youngers	22.567	9.652		
Groups X Partners			2.0991	1,84
Trained X Peers	22.733	7.679		
Trained X Youngers	26.167	9.983		
Untrained X Peers	19.233	8.378		
Untrained X Youngers	18.967	7.942		

Variable	Mean	S.D.	F	Df
19. Adjectives (cont'd)				
Measures			1.2895	1,84
Pre	21.050	8.642		
Post	22.500	9.234		
Groups X Measures			0.3150	1,84
Trained X Pre	23.367	10.539		
X Post	25.533	7.157		
Untrained X Pre	18.733	5.458		
X Post	19.467	10.160		
Partners X Measures			0.5535	1,84
Peers X Pre	20.733	7.887		
Peers X Post	21.233	8.533		
Youngers X Pre	21.367	9.463		
Youngers X Post	23.767	9.849		
Groups X Partners X Measures			0.1637	1,84
Trained X Peers X Pre	21.867	9.456		
Trained X Peers X Post	23.600	5.578		
Trained X Youngers X Pre	24.867	11.655		
Trained X Youngers X Post	27.467	8.814		
Untrained X Peers X Pre	19.600	6.057		
Untrained X Peers X Post	18.867	10.412		
Untrained X Youngers X Pre	17.867	4.838		
Untrained X Youngers X Post	20.067	10.229		

Variable	Mean	S.D.	F	Df
20. <u>Prepositional Phrases</u>				
Groups			2.5637	1,28
Trained	15.917	8.024		
Untrained	12.900	5.565		
Partners			6.8253*	1,84
Peers	13.167	6.071		
Youngers	15.650	7.746		
Groups X Partners			1.4637	1,84
Trained X Peers	14.100	6.687		
Trained X Youngers	(17.733)	(8.913)		
Untrained X Peers	(12.233)	(5.335)		
Untrained X Youngers	(13.567)	(5.799)		
Measures			0.8636	1,84
Pre	13.967	7.328		
Post	14.850	6.774		
Groups X Measures			3.2615	1,84
Trained X Pre	16.333	8.957		
X Post	15.500	7.099		
Untrained X Pre	11.600	4.174		
X Post	14.200	6.488		
Partners X Measures			0.5684	1,84
Peers X Pre	12.367	6.505		
Peers X Post	13.967	5.599		
Youngers X Pre	15.567	7.851		
Youngers X Post	15.733	7.772		

Variable	Mean	S.D.	F	Df
20. Prepositional Phrases (cont'd)				
Groups X Partners X Measures			0.5684	1,84
Trained X Peers X Pre	13.800	7.812		
Trained X Peers X Post	14.400	5.604		
Trained X Youngers X Pre	18.867	9.561		
Trained X Youngers X Post	16.600	8.390		
Untrained X Peers X Pre	10.933	4.713		
Untrained X Peers X Post	13.533	5.755		
Untrained X Youngers X Pre	12.267	3.595		
Untrained X Youngers X Post	14.867	1.280		
21. Infinitives				
Groups			4.9244*	1,28
Trained	8.000	4.194		
Untrained	5.810	3.709		
Partners			0.0455	1,84
Peers	6.833	4.211		
Youngers	6.987	4.008		
Groups X Partners			1.3754	1,84
Trained X Peers	7.567	4.516		
Trained X Youngers	8.433	3.875		
Untrained X Peers	6.100	3.818		
Untrained X Youngers	5.500	3.637		

Variable	Mean	S.D.	F	Df
21. Infinitives (cont'd)				
Measures			0.0455	1,84
Pre	6.967	4.345		
Post	6.833	3.863		
Groups X Measures			0.4092	1,84
Trained X Pre	8.267	4.849		
X Post	7.733	3.483		
Untrained X Pre	5.667	3.377		
X Post	5.933	4.068		
Partners X Measures			0.0455	1,84
Peers X Pre	6.967	4.590		
Peers X Post	6.700	3.870		
Youngers X Pre	6.967	4.165		
Youngers X Post	6.967	3.917		
Groups X Partners X Measures			1.3754	1,84
Trained X Peers X Pre	7.533	5.276		
Trained X Peers X Post	7.600	3.795		
Trained X Youngers X Pre	9.000	4.440		
Trained X Youngers X Post	7.867	3.270		
Untrained X Peers X Pre	6.400	3.880		
Untrained X Peers X Post	5.800	3.858		
Untrained X Youngers X Pre	4.933	2.712		
Untrained X Youngers X Post	6.067	4.399		

Variable	Mean	S.D.	F	Df
22. <u>Tag Questions</u>				
Groups			0.6394	1,28
Trained	1.017	1.682		
Untrained	0.733	1.326		
Partners			0.0437	1,84
Peers	0.850	1.436		
Youngers	0.900	1.602		
Groups X Partners			4.6715 *	1,84
Trained X Peers	0.733	1.081		
Trained X Youngers	1.300	2.103		
Untrained X Peers	0.697	1.732		
Untrained X Youngers	0.500	0.682		
Measures			2.5715	1,84
Pre	1.067	1.604		
Post	0.683	1.408		
Groups X Measures			2.5715	1,84
Trained X Pre	1.400	1.976		
X Post	0.633	1.245		
Untrained X Pre	0.733	1.048		
X Post	0.733	1.574		
Partners X Measures			2.1437	1,84
Peers X Pre	0.867	1.196		
Peers X Post	0.833	1.663		
Youngers X Pre	1.267	1.929		
Youngers X Post	0.533	1.106		

Variable	Mean	S.D.	F	Df
22. Tag Questions (cont'd)				
Groups X Partners X Measures			0.3937	1,84
Trained X Peers X Pre	0.867	1.125		
Trained X Peers X Post	0.600	1.056		
Trained X Youngers X Pre	1.933	2.492		
Trained X Youngers X Post	0.667	1.447		
Untrained X Peers X Pre	0.867	1.302		
Untrained X Peers X Post	1.067	2.120		
Untrained X Youngers X Pre	0.600	0.737		
Untrained X Youngers X Post	0.400	0.632		
23. Deleted Thats				
Groups			0.7521	1,28
Trained	1.983	2.004		
Untrained	1.617	1.627		
Partners			2.9389	1,84
Peers	1.550	1.545		
Youngers	2.050	2.054		
Groups X Partners			0.000	1,84
Trained X Peers	1.733	1.874		
Trained X Youngers	2.233	2.128		
Untrained X Peers	1.367	1.129		
Untrained X Youngers	1.867	1.995		

Variable	Mean	S.D.	F	Df
23. Deleted Thats (cont'd)				
Measures			6.9097**	1,84
Pre	2.183	2.054		
Post	1.417	1.448		
Groups X Measures			1.3062	1,84
Trained X Pre	2.533	2.240		
X Post	1.433	1.591		
Untrained X Pre	1.833	1.821		
X Post	1.400	1.404		
Partners X Measures			0.0522	1,84
Peers X Pre	1.967	1.732		
Peers X Post	1.133	1.224		
Youngers X Pre	2.400	2.343		
Youngers X Post	1.700	1.685		
Groups X Partners X Measures			0.0131	1,84
Trained X Peers X Pre	2.333	2.127		
Trained X Peers X Post	1.133	1.407		
Trained X Youngers X Pre	2.733	2.404		
Trained X Youngers X Post	1.733	1.751		
Untrained X Peers X Pre	1.600	1.183		
Untrained X Peers X Post	1.133	1.060		
Untrained X Youngers X Pre	2.067	2.314		
Untrained X Youngers X Post	1.667	1.676		

Variable	Mean	S.D.	F	Df
24. <u>Other Deletions</u>				
Groups			3.8343	1,28
Trained	2.800	2.335		
Untrained	1.817	1.631		
Partners			0.6976	1,84
Peers	2.183	1.771		
Youngers	2.433	(2.332)		
Groups X Partners			6.2786*	1,84
Trained X Peers	2.300	1.803		
Trained X Youngers	3.300	2.706		
Untrained X Peers	2.067	1.760		
Untrained X Youngers	1.567	1.478		
Measures			0.3752	1,84
Pre	2.400	2.352		
Post	2.217	1.748		
Groups X Measures			2.9796	1,84
Trained X Pre	2.633	2.918		
X Post	2.967	1.586		
Untrained X Pre	2.167	1.621		
X Post	1.467	1.592		
Partners X Measures			1.9378	1,84
Peers X Pre	2.067	1.660		
Peers X Post	2.300	1.896		
Youngers X Pre	2.733	2.876		
Youngers X Post	2.133	1.613		

Variable	Mean	S.D.	F	Df
24. Other Deletions (cont'd)				
Groups X Partners X Measures			2.9796	1,84
Trained X Peers X Pre	1.667	1.676		
Trained X Peers X Post	2.933	1.751		
Trained X Youngers X Pre	3.600	3.582		
Trained X Youngers X Post	3.000	1.464		
Untrained X Peers X Pre	2.467	1.598		
Untrained X Peers X Post	1.667	1.877		
Untrained X Youngers X Pre	1.867	1.642		
Untrained X Youngers X Post	1.267	1.280		
25. Ratio Of Complexity				
Groups			1.5109	1,28
Trained	3.440	.746		
Untrained	3.229	.567		
Partners			0.3541	1,84
Peers	3.363	.679		
Youngers	3.306	.663		
Groups X Partners			4.1233*	1,84
Trained X Peers	3.371	.717		
Trained X Youngers	3.510	.780		
Untrained X Peers	3.356	.650		
Untrained X Youngers	3.102	.445		

Variable	Mean	S.D.	F	Df
25. Ratio Of Complexity (cont'd)				
Measures			0.0001	1,84
Pre	3.335	.639		
Post	3.334	.702		
Groups X Measures			7.0057**	1,84
Trained X Pre	3.313	.648		
X Post	3.568	.825		
Untrained X Pre	3.358	.640		
X Post	3.101	.459		
Partners X Measures			0.8166	1,84
Peers X Pre	3.408	.699		
Peers X Post	3.319	.667		
Youngers X Pre	3.263	.575		
Youngers X Post	3.349	.747		
Groups X Partners X Measures			0.5267	1,84
Trained X Peers X Pre	3.322	.660		
Trained X Peers X Post	3.420	.791		
Trained X Youngers X Pre	3.303	.659		
Trained X Youngers X Post	3.716	.858		
Untrained X Peers X Pre	3.493	.749		
Untrained X Peers X Post	3.219	.524		
Untrained X Youngers X Pre	3.222	.498		
Untrained X Youngers X Post	2.983	.368		

Table C

25 Linguistic Variables Of Trained Learning - Disabled Children With Peer And Younger Partners On Pre, Post, Maintenance And Generalization Tests. A 2 (Partners) X 4 (Measures) ANOVAR

Variable	Mean	S.D.	F	Df
1. Words In Total				
Partners			9.0267 **	1,14
Peers	255.433	91.020		
Youngers	295.600	102.376		
Measures			7.6204 **	1,42
Pre	321.467	103.886		
Post	284.567	81.382		
Maintenance	277.200	100.657		
Generalization	218.833	81.878		
Partners X Measures			2.2848	1,42
Peers X Pre	285.200	93.376		
Peers X Post	271.867	86.808		
Peers X Maintenance	266.800	106.707		
Peers X Generalization	197.867	48.424		
Youngers X Pre	357.733	104.010		
Youngers X Post	297.267	76.407		
Youngers X Maintenance	287.600	96.794		
Youngers X Generalization	239.800	102.956		

Variable	Mean	S.D.	F	Df
2. Words In T-Units				
Partners			10.4070**	1,14
Peers	214.433	80.363		
Youngers	250.550	87.730		
Measures			8.6984**	1,42
Pre	276.633	88.084		
Post	240.000	70.202		
Maintenance	233.600	85.979		
Generalization	179.733	71.504		
Partners X Measures			1.5895	1,42
Peers X Pre	246.600	84.388		
Peers X Post	227.467	71.274		
Peers X Maintenance	224.467	90.740		
Peers X Generalization	159.200	45.988		
Youngers X Pre	306.667	83.771		
Youngers X Post	252.533	69.224		
Youngers X Maintenance	242.733	83.068		
Youngers X Generalization	200.267	87.021		
3. Words Excluded Total				
Partners			1.6296	1,14
Peers	39.533	20.459		
Youngers	44.017	22.005		

Variable	Mean	S.D.	F	Df
3. Words Excluded Total (cont'd)				
Measures			0.8019	1,42
Pre	44.567	24.646		
Post	43.100	19.537		
Maintenance	42.700	19.314		
Generalization	36.733	21.407		
Partners X Measures			2.6929	1,42
Peers X Pre	36.600	20.042		
Peers X Post	44.400	22.554		
Peers X Maintenance	42.333	20.106		
Peers X Generalization	34.800	19.553		
Youngers X Pre	52.533	26.843		
Youngers X Post	41.800	16.683		
Youngers X Maintenance	43.067	19.189		
Youngers X Generalization	38.667	23.642		
4. Excluded Introductory Phrases				
Partners			0.0052	1,14
Peers	3.917	3.797		
Youngers	3.867	4.180		
Measures			0.2724	1,42
Pre	4.433	5.853		
Post	3.867	3.288		
Maintenance	3.467	3.288		
Generalization	3.800	2.917		

Variable	Mean	S.D.	F	Df
4. Excluded Introductory Phrases (cont'd)				
Partners X Measures			0.4062	1,42
Peers X Pre	4.067	5.147		
Peers X Post	3.667	3.457		
Peers X Maintenance	3.800	3.688		
Peers X Generalization	4.133	2.924		
Youngers X Pre	4.800	6.646		
Youngers X Post	4.067	3.218		
Youngers X Maintenance	3.133	2.924		
Youngers X Generalization	3.467	2.973		
5. Mazes				
Partners			2.1111	1,14
Peers	4.500	7.683		
Youngers	6.833	6.934		
Measures			1.1972	1,42
Pre	4.567	7.664		
Post	7.667	10.066		
Maintenance	5.433	4.939		
Generalization	5.000	5.760		

Variable	Mean	S.D.	F	Df
5. Mazes (cont'd)				
Partners X Measures			1.6237	1,42
Peers X Pre	1.333	1.915		
Peers X Post	6.400	12.687		
Peers X Maintenance	5.133	5.502		
Peers X Generalization	5.133	6.198		
Youngers X Pre	7.800	9.778		
Youngers X Post	8.933	6.745		
Youngers X Maintenance	5.733	4.480		
Youngers X Generalization	4.867	5.502		
6. False Starts				
Partners			2.7823	1,14
Peers	11.900	10.898		
Youngers	9.017	10.273		
Measures			0.4260	1,42
Pre	12.400	10.102		
Post	9.533	11.010		
Maintenance	9.600	7.514		
Generalization	10.300	13.404		

Variable	Mean	S.D.	F	Df
6. False Starts (cont'd)				
Partners X Measures			0.9255	1,42
Peers X Pre	12.000	9.776		
Peers X Post	13.533	14.010		
Peers X Maintenance	10.733	9.004		
Peers X Generalization	11.333	11.088		
Youngers X Pre	12.800	10.745		
Youngers X Post	5.533	4.533		
Youngers X Maintenance	8.467	5.755		
Youngers X Generalization	9.267	15.714		
7. Audible Pauses				
Partners			3.7416	1,14
Peers	7.150	4.380		
Youngers	8.617	5.201		
Measures			1.8276	1,42
Pre	8.533	5.257		
Post	7.933	5.362		
Maintenance	8.667	4.505		
Generalization	6.400	4.031		

Variable	Mean	S.D.	F	Df
7. Audible Pauses (cont'd)				
Partners X Measures			0.5287	1,42
Peers X Pre	7.733	5.675		
Peers X Post	7.800	4.459		
Peers X Maintenance	7.733	3.693		
Peers X Generalization	5.333	3.222		
Youngers X Pre	9.333	4.865		
Youngers X Post	8.067	6.296		
Youngers X Maintenance	9.600	5.152		
Youngers X Generalization	7.467	4.565		
8. Repeated Phrases*				
Partners			12.0988**	1,14
Peers	2.767	3.254		
Youngers	6.133	6.374		
Measures			1.7369	1,42
Pre	5.833	7.216		
Post	3.367	3.605		
Maintenance	4.967	4.909		
Generalization	3.633	4.752		

Variable	Mean	S.D.	F	Df
8. Repeated Phrases (cont'd)				
Partners X Measures			1.3874	1,42
Peers X Pre	2.933	3.474		
Peers X Post	2.133	2.475		
Peers X Maintenance	3.533	3.925		
Peers X Generalization	2.467	3.137		
Youngers X Pre	8.733	8.819		
Youngers X Post	4.600	4.188		
Youngers X Maintenance	6.400	5.488		
Youngers X Generalization	4.800	5.833		
9. Incomplete Clauses				
Partners			0.5405	1,14
Peers	11.033	10.467		
Youngers	12.317	10.932		
Measures			0.5591	1,42
Pre	9.967	9.866		
Post	13.500	12.325		
Maintenance	12.667	9.732		
Generalization	10.567	10.724		

Variable	Mean	S.D.	F	Df
9. Incomplete Clauses (cont'd)				
Partners X Measures			0.4564	1,42
Peers X Pre	9.933	8.795		
Peers X Post	11.933	10.780		
Peers X Maintenance	11.333	10.472		
Peers X Generalization	10.933	12.498		
Youngers X Pre	10.000	11.148		
Youngers X Post	15.067	13.900		
Youngers X Maintenance	14.000	9.095		
Youngers X Generalization	10.200	9.041		
10. Number Of T-Units				
Partners			6.3705*	1,14
Peers	30.483	12.071		
Youngers	34.350	13.160		
Measures			11.6916**	1,42
Pre	40.867	14.529		
Post	32.867	10.068		
Maintenance	31.233	10.994		
Generalization	24.700	9.685		

Variable	Mean	S.D.	F	Df
10. Number Of T-Units (cont'd)				
Partners X Measures			3.2360*	1,42
Peers X Pre	36.267	13.849		
Peers X Post	32.000	10.923		
Peers X Younger	31.133	11.186		
Peers X Generalization	22.333	8.200		
Youngers X Pre	45.467	14.147		
Youngers X Post	33.533	9.471		
Youngers X Maintenance	31.333	11.191		
Youngers X Generalization	27.067	10.727		
11. Number Of Complex T-Units				
Partners			2.2299	1,14
Peers	5.683	2.849		
Youngers	6.567	2.913		
Measures			1.6112	1,42
Pre	6.967	3.882		
Post	5.767	2.674		
Maintenance	6.300	2.020		
Generalization	5.467	2.636		

Variable	Mean	S.D.	F	Df
11. Number Of Complex T-Units (cont'd)				
Partners X Measures			1.2530	1,42
Peers X Pre	6.333	4.499		
Peers X Post	4.733	1.907		
Peers X Maintenance	6.200	2.145		
Peers X Generalization	5.467	1.995		
Youngers X Pre	7.600	3.180		
Youngers X Post	6.800	2.981		
Youngers X Maintenance	6.400	1.957		
Youngers X Generalization	5.467	3.226		
12. Number Of Clauses In Complex T-Units				
Partners			2.3536	1,14
Peers	12.650	6.640		
Youngers	14.550	6.863		
Measures			1.2844	1,42
Pre	15.333	8.243		
Post	12.900	6.661		
Maintenance	14.167	4.909		
Generalization	12.000	5.907		

Variable	Mean	S.D.	F	Df
12. Number Of Clauses In Complex T-Units (cont'd)				
Partners X Measures			1.2432	1,42
Peers X Pre	14.533	9.680		
Peers X Post	10.400	4.793		
Peers X Maintenance	13.667	6.207		
Peers X Generalization	12.000	4.456		
Youngers X Pre	16.133	6.760		
Youngers X Post	15.400	7.453		
Youngers X Maintenance	14.667	5.864		
Youngers X Generalization	12.000	7.241		
13. Total Number Of Clauses				
Partners			6.7251*	1,14
Peers	37.333	13.729		
Youngers	41.867	14.197		
Measures			10.4793**	1,42
Pre	49.267	16.793		
Post	39.000	9.847		
Maintenance	38.867	12.077		
Generalization	31.267	10.979		

Variable	Mean	S.D.	F	Df
13. <u>Total Number Of Clauses</u> (cont'd)				
Partners X Measures			1.7211	1,42
Peers X Pre	44.600	17.154		
Peers X Post	37.533	10.596		
Peers X Maintenance	38.333	13.015		
Peers X Generalization	28.867	9.164		
Youngers X Pre	53.933	15.595		
Youngers X Post	40.467	9.164		
Youngers X Maintenance	39.400	11.494		
Youngers X Generalization	33.667	12.385		
14. <u>Total Number Of Complexities</u>				
Partners			10.1044**	1,14
Peers	101.967	36.365		
Youngers	119.117	40.842		
Measures			11.3262**	1,42
Pre	132.767	45.229		
Post	113.367	27.615		
Maintenance	115.167	35.064		
Generalization	80.867	29.970		

Variable	Mean	S.D.	F	Df	
14. Total Number Of Complexities (cont'd)					
Partners X Measures			2.3794	1,42	n.r.
Peers X Pre	117.400	41.703			
Peers X Post	106.667	28.712			
Peers X Maintenance	112.400	33.918			
Peers X Generalization	71.400	21.507			
Youngers X Pre	148.133	44.636			
Youngers X Post	120.067	25.672			
Youngers X Maintenance	117.933	37.147			
Youngers X Generalization	90.333	34.727			
15. Passives		- Nil Scores -			
16. Nominalizations					
Partners			0.0000	1,14	
Peers	0.100	0.354			
Youngers	0.100	0.354			
Measures			0.8394	1,42	
Pre	0.167	0.379			
Post	0.133	0.424			
Maintenance	---	---			
Generalization	0.100	0.403			

Variable	Mean	S.D.	F	Df
16. Nominalizations (cont'd)				
Partners X Measures			0.2534	1,42
Peers X Pre	0.133	0.352		
Peers X Post	0.133	0.352		
Peers X Maintenance	0.000	0.000		
Peers X Generalization	0.133	0.516		
Youngers X Pre	0.200	0.414		
Youngers X Post	0.133	0.516		
Youngers X Maintenance	0.000	0.000		
Youngers X Generalization	0.067	0.258		
17. Appositives				
Partners			1.0346	1,14
Peers	0.283	0.691		
Youngers	0.417	0.850		
Measures			4.0818**	1,42
Pre	0.167	0.531		
Post	0.700	1.022		
Maintenance	0.367	0.850		
Generalization	0.167	0.461		

Variable	Mean	S.D.	F	Df	F prob.
17. Appositives (cont'd)					
Partners X Measures			2.1216	1,42	n.r.
Peers X Pre	0.133	0.516			
Peers X Post	0.400	0.632			
Peers X Maintenance	0.467	1.060			
Peers X Generalization	0.133	0.352			
Youngers X Pre	0.200	0.561			
Youngers X Post	1.000	1.254			
Youngers X Maintenance	0.267	0.594			
Youngers X Generalization	0.200	0.561			
18. Adverbs					
Partners			8.6649**	1,14	0.01
Peers	20.050	8.920			
Youngers	25.433	12.298			
Measures			4.6047**	1,42	0.001
Pre	28.567	13.960			
Post	20.667	9.110			
Maintenance	22.333	8.503			
Generalization	19.400	9.905			

Variable	Mean	S.D.	F	Df
18. Adverbs (cont'd)				
Partners X Measures			0.9500*	1,42
Peers X Pre	24.267	11.423		
Peers X Post	19.000	8.494		
Peers X Maintenance	20.533	7.586		
Peers X Generalization	16.400	6.356		
Youngers X Pre	32.867	15.282		
Youngers X Post	22.333	9.686		
Youngers X Maintenance	24.133	9.234		
Youngers X Generalization	22.400	11.981		
19. Adjectives				
Partners			3.8983*	1,14
Peers	21.083	9.127		
Youngers	23.450	9.892		
Measures			7.9469**	1,42
Pre	23.367	10.539		
Post	25.533	7.157		
Maintenance	25.533	9.438		
Generalization	14.633	6.272		

Variable	Mean	S.D.	F	Df
19. Adjectives (cont'd)				
Partners X Measures			1.3559	1,42
Peers X Pre	21.867	9.456		
Peers X Post	23.600	5.578		
Peers X Maintenance	25.867	9.999		
Peers X Generalization	13.000	5.345		
Youngers X Pre	24.867	11.655		
Youngers X Post	27.467	8.184		
Youngers X Maintenance	25.200	9.182		
Youngers X Generalization	16.267	6.871		
20. Prepositional Phrases				
Partners			10.8540**	1,14
Peers	12.300	7.024		
Youngers	14.983	8.727		
Measures			9.4820**	1,42
Pre	16.333	8.957		
Post	15.500	7.099		
Maintenance	15.100	7.503		
Generalization	7.633	5.021		

Variable	Mean	S.D.	F	Df
20. Prepositional Phrases (cont'd)				
Partners X Measures			1.8074	1,42
Peers X Pre	13.800	7.812		
Peers X Post	14.400	5.604		
Peers X Maintenance	14.000	7.540		
Peers X Generalization	7.000	4.276		
Youngers X Pre	18.867	9.561		
Youngers X Post	16.600	8.390		
Youngers X Maintenance	16.200	7.561		
Youngers X Generalization	8.267	5.750		
21. Infinitives				
Partners			2.5169	1,14
Peers	6.333	4.074		
Youngers	7.267	4.584		
Measures			4.7627**	1,42
Pre	8.267	4.849		
Post	7.733	3.483		
Maintenance	4.667	4.037		
Generalization	4.533	4.125		

Variable	Mean	S.D.	F	Df
21. Infinitives				
Partners X Measures			0.2512	1,42
Peers X Pre	7.533	5.276		
Peers X Post	7.600	3.795		
Peers X Maintenance	6.333	3.155		
Peers X Generalization	3.867	2.825		
Youngers X Pre	9.000	4.440		
Youngers X Post	7.867	3.270		
Youngers X Maintenance	7.000	4.855		
Youngers X Generalization	5.200	5.130		
22. Tag Questions				
Partners			2.8480	1,14
Peers	0.583	0.996		
Youngers	1.100	2.056		
Measures			2.1650	1,42
Pre	1.400	1.976		
Post	0.633	1.245		
Maintenance	0.933	1.982		
Generalization	0.400	0.968		

Variable	Mean	S.D.	F	Df
22. Tag Questions (cont'd)				
Partners X Measures			0.9864	1,42
Peers X Pre	0.867	1.125		
Peers X Post	0.600	1.056		
Peers X Maintenance	0.667	1.113		
Peers X Generalization	0.200	0.561		
Youngers X Pre	1.933	2.492		
Youngers X Post	0.667	1.447		
Youngers X Maintenance	1.200	2.597		
Youngers X Generalization	0.600	1.242		
23. Deleted Thats				
Partners			0.5936	1,14
Peers	1.833	1.787		
Youngers	2.033	1.966		
Measures			1.8017	1,42
Pre	2.533	2.240		
Post	1.433	1.591		
Maintenance	2.067	1.799		
Generalization	1.700	1.705		

Variable	Mean	S.D.	F	Df
23. Deleted Thats (cont'd)				
Partners X Measures			0.4221	1,42
Peers X Pre	2.333	2.127		
Peers X Post	1.133	1.407		
Peers X Maintenance	2.067	1.710		
Peers X Generalization	1.800	1.781		
Youngers X Pre	2.733	2.404		
Youngers X Post	1.733	1.751		
Youngers X Maintenance	2.067	1.944		
Youngers X Generalization	1.600	1.682		
24. Other Deletions				
Partners			2.8971	1,14
Peers	2.350	1.655		
Youngers	2.833	2.330		
Measures			1.6773	1,42
Pre	2.633	2.918		
Post	2.967	1.586		
Maintenance	2.800	1.750		
Generalization	1.967	1.474		

Variable	Mean	S.D.	F	Df
24. Other Deletions (cont'd)				
Partners X Measures			3.1683 *	1,42
Peers X Pre	1.667	1.676		
Peers X Post	2.933	1.751		
Peers X Maintenance	2.933	1.387		
Peers X Generalization	1.867	1.506		
Youngers X Pre	3.600	3.582		
Youngers X Post	3.000	1.464		
Youngers X Maintenance	2.667	2.093		
Youngers X Generalization	2.067	1.486		
25. Ratio Of Complexity				
Partners			1.851	1,14
Peers	3470.667	780.045		
Youngers	3600.467	826.463		
Measures			2.9385 *	1,42
Pre	3313.300	648.338		
Post	3568.200	825.241		
Maintenance	3821.933	770.434		
Generalization	3438.833	896.287		

Variable	Mean	S.D.	F	Df
25. Ratio Of Complexity (cont'd)				
Partners X Measures			0.3622	1,42
Peers X Pre	3322.667	660.445		
Peers X Post	3420.067	791.099		
Peers X Maintenance	3759.867	766.137		
Peers X Generalization	3380.067	889.190		
Youngers X Pre	3303.933	659.040		
Youngers X Post	3716.333	858.970		
Youngers X Maintenance	3884.000	796.438		
Youngers X Generalization	3497.600	930.582		

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