

The Effects of Linguistic Demand on the Verbal Responses of Learning Disabled Children

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In a conversational situation, information from a listener can be obtained in two ways: via a question/answer approach or via an instruction/response procedure. Regardless of the method, whenever information is sought from a listener, a demand is placed upon that individual to satisfy the speaker's intention. In doing so, the listener/respondent has to create, plan, and organize an utterance which is appropriate to the social situation and which preserves the conventions of the language system (Eisenenson, 1980). As questions or instructions become more complex, greater demands and stress are placed on the respondent to perform the linguistic operations that are required for an appropriate response.

The level of demand inherent in a particular communicative paradigm depends not only upon the linguistic complexity of the stimulus, but also upon the listener's uncertainty about the communicative situation. The speaker's responsibility will be to acquire information either by asking a question or by giving an instruction. At times the speaker will require a simple response to a question (e.g., "What is this?") and, at other times, an elaborate one. (e.g., "Tell me what to do with this.") When an elaborate response is required, the listener is less certain about resolving the issue presented in the question or instruction. Therefore, the more uncertain the listener, the more demanding and stressful the situation becomes for that individual.

It is apparent that when an individual is called upon to respond, the individual has demands placed upon him/her from two sources: the degree of complexity of the linguistic signal that must be processed cognitively and the importance of understanding the communicative context of the verbal message. In response to different levels of demand, the listener's behavior will change. It has been observed that linguistically demanding situations induce traits that reflect stress in normal and learning disabled children. These behaviors include dysfluency (Haynes & Hood, 1978), delayed reaction time (Johnson & Myklebust, 1967; Denckla, 1974; Wiig & Semel, 1975; Wiig, Lapointe, & Semel, 1975), inappropriate responses (Perfetti, 1977; Wiig & Semel, 1976), and an increase in errors (Denckla, 1974; Wiig & Semel, 1975).

The amount of demand that is placed on a child as a communicator will influence his language performance. In most situations, these demands will evoke stress, and the

child's behavior as a communicator will change in relation to the different degrees of demand placed upon him/her. Given the prevailing view that a disorder of language underlies many learning disabilities, one may hypothesize that learning disabled children will exhibit more stress induced traits than non-learning disabled children when placed in demanding conversational situations. If this hypothesis is true, the identification of behavioral traits associated with specific verbal contexts would have diagnostic value. Therefore, the purpose of this study was to determine whether or not normal and learning disabled children differ with respect to specific behaviors that are known to be related to stress: dysfluency, delayed reaction time, appropriateness of responses, and correctness of responses, all which may vary as a function of increased levels of demand placed upon them during verbal language tasks. It is hypothesized that normal and learning disabled children can be distinguished by closely monitoring the behavioral traits that accompany a child's responses to a variety of questions and instructions involving degrees of linguistic complexity.

Method

Subjects

Subjects for this study included 18 school-age children ranging in age from seven years five months to nine years eleven months. Nine of the subjects were learning disabled and nine were non-learning disabled. The mean age of both groups was eight years three months. Learning disabled subjects were identified by a learning disabilities specialist and by a process of exclusion as defined by the Federal Statute PL#94-142 (Education for All Handicapped Act of 1975). A control group of non-learning disabled school-age children was selected and matched as closely as possible to the experimental group on the basis of grade level, sex, and age. All subjects had been screened for normal hearing, and children who exhibited any physical abnormalities were not included in the study.

Procedures

The 18 subjects were administered the Initial Evaluation Portion of the *Stocker Probe Technique*. Devised by Beatrice Stocker (Stocker, 1980), this technique consists of a series of five questions or requests of graduated levels of complexity. As the probes become more complex, the demand on the listener becomes greater. Originally designed to evaluate stuttering

behavior in young children, the probe technique was based on the hypothesis that increasing levels of demand will produce covarying increases in dysfluency. The probe technique has been found to be a valid way of showing the effect of certain linguistic factors on stuttering (Stocker & Usprich, 1976). In this study, the probe technique was used as a method to provoke stress in children, which potentially affects the manner, content, and rate of their language production.

In the probe technique, the level of demand associated with each question/instruction is reflected in the type of response the subject gives. These responses may range from a single word utterance for a Level I question, to a more novel and uncertain response that varies in both manner and content for a Level V instruction. When conducting the probe technique, the examiner presents the subject with an object and asks a series of questions about it, which place varying degrees of demand on the listener/respondent. The different levels of demand require varying degrees of creativity on the part of the subject which are reflected in the types of responses that are expected. Two additional demand levels were added to the original five Stocker probes: a question requiring a yes/no response and an instruction to formulate a sentence using a given word. The additional levels were added in order to incorporate commonly used question/instruction type stimuli.

A total of seven levels of demand were given to each child as follows:

Level I: The question produces a single word response which repeats one of the words in the examiner's question, for example, "Is it hard or soft?"

According to Stocker and Usprich (1976), the degree of demand a task places on a listener is directly related to uncertainty about the communicative response. Therefore, the repetition of a word that has already been presented would be considered one of the most predictable types of responses.

Level II: The question produces a yes/no response to the presentation of linguistic relationships for example, "Is this cold?"

Yes/no responses to questions reflect the subject's knowledge and interpretation of linguistic relationships and ambiguities that have already been presented by the examiner. Therefore, yes/no type responses would be considered to be among some of the least novel and the most expected, thereby requiring a lesser degree of communicative responsibility on the part of the person responding.

Level III: The question produces a single word response—the name of a common object that is present in the examining situation but not in the given question, for example, "What is it?"

At this level of response, the communicative responsibility

of the listener begins to increase. The individual's response is in a single word form; it is not novel or unexpected by the speaker; the response can be either correct or incorrect; and the speaker requires only limited information (a single word) to answer this question.

Level IV: The question produces a response consisting of a phrase in which the referents are not present in the examining situation and are not named in the question, for example, "Where would you keep one?"

The degree of demand increases as the speaker requires a greater amount of information to resolve his uncertainty about who, what, when, where, why, and how concerning the item in question.

Level V: The request produces a series of attributes not named in the request, for example, "Tell me everything you know about it?"

Unlike previous levels, the syntactic form of the response is not constrained by the nature of the question. The total response is more novel and uncertain. Therefore, a greater amount of information is required to respond to the speaker's request.

Level VI: The request is open-ended and produces the most variable response in both form and content, for example, "Make up a short story about it."

Upper levels of communicative responsibility are required by the speaker in this situation, and high levels of uncertainty may be experienced by the listener. The linguistic complexity of a response to this request may be variable, but the subject is not constrained in any way by the question form.

Level VII: The request for formulation and production of a sentence which produces a given word, for example, "Make up a sentence using the word ____."

This request requires the listener to recognize the structural constraints imposed on production of a sentence by specific word selections. Again the subject's response to the request may vary, but in this case, specific constraints are placed on the subject by the type of request and the structural requirements at this level.

Each subject was seen individually for the administration of the Initial Evaluation portion of the *Stocker Probe Technique* with the additional yes/no question and sentence formulation modes included. The subjects were presented with five familiar objects (a car, a toothbrush, an egg, a shoelace, and a balloon), followed by the presentation of a set of questions/instructions by the examiner. The questions and instructions for the seven levels of demand were presented in random order. Each question/instruction was presented once with requests for repetition of the test stimulus acknowledged and noted by the examiner. All responses were tape recorded.

Response Analysis

The responses of all subjects were judged by the examiner and by two graduate students in speech-language pathology who were experienced with dysfluent clients. Dysfluency was defined as an interruption in the ease and smoothness with which sounds, syllables, words, phrases, and clauses are retrieved and joined together for speaking. Subjects were given a plus (+) or minus (-) rating for presence or absence of dysfluency for each response to the presentation of a test stimulus (question/request). Reaction time was defined as the measured time between the completed presentation of the test stimulus and the onset of the child's response to the stimulus, and was determined by means of a stopwatch to the nearest tenth of a second.

Appropriateness of responses was judged by the examiner for levels IV through VII. The criterion for "appropriateness" was based upon that used in the Verbal Expression Subtest of the *Illinois Test of Psycholinguistic Abilities* (Kirk & McCarthy, 1968). According to the ITPA model, appropriateness of a response relates to that which is relevant, discrete, and approximately factual, and which expresses a characteristic function or relationship of an object presented.

Selected parts of a behavior rating scale by Mykelbust and Boshes (1969) were used to determine the acceptability of behavior demonstrated by each subject in the normal classroom setting prior to testing. The scale also was completed during testing to evaluate the subjects' observable behavior while responding to the seven levels of the probe technique. The rating scale include ten behaviors: ability to follow oral directions, promptness, learning directions, cooperation, attention, ability to organize, ability to cope with new situations, social acceptance, completion of assignments, and tactfulness. Each child was assigned a rating on a scale of zero to five for each behavior. A rating of zero indicates that the behavior is absent or totally inappropriate, and a rating of five indicates that the behavior is outstanding. The subjects' behavior prior to and during testing was compared.

Reliability of Judges

Interjudge reliability was determined by computing the percentage of agreement between the two judges on ratings of dysfluency and measurements of reaction time. The judges were in agreement on 96.8% of the ratings of dysfluency for both groups of subjects. For reaction time measures in both groups, the judges were in agreement on 88.9% of the measures to within 0.5 seconds of the estimated reaction time.

Results and Discussion

The null hypothesis was that there is no difference between learning disabled and normal subjects for the number of dysfluencies, the mean reaction time, the number of appropriate responses, and the number of correct responses at various levels

of demand. An ANOVA was used in the treatment of the data. The results of this analysis showed no difference between the learning disabled and normal subjects for dysfluency at demand levels I through V. However, there was a significant difference between the groups in dysfluency at demand levels VI and VII ($F=25.12, p<.05$). Although both groups had more dysfluencies at high levels of demand, the learning disabled group exhibited significantly more dysfluencies (approximately one-third more dysfluent responses) than the normal group.

No significant differences were found between learning disabled and normal groups for reaction time, for appropriateness of response, and for correctness of response at all the levels of demand. However, there was a trend for the learning disabled group to have more errors in each of the demand categories. This trend is compatible with other research results. Wiig and Semel (1975) and Denckla (1974) reported that learning disabled children exhibited longer response latencies than did normal children on various verbal tasks. Also, Wiig and Semel (1976) reported that learning disabled children tend to make inappropriate responses by inserting meaningless phrases, indefinites, and words which lack specificity into their utterances, and also by including only a limited amount of abstract information in their verbal production. Denckla (1974) reported that dyslexic children made significantly fewer correct responses than normal children on picture naming tasks. Perfetti et al. (1978) reported similar results for dyslexic students on word retrieval tasks.

One interesting occurrence in this study was noted in the observation ratings using the Mykelbust and Boshes scale. A significant negative correlation ($TAU = 0.4454, p<.05$) was found between the learning disabled subjects' ability to follow oral directions and their mean reaction time. This suggests that learning disabled subjects who took longer to respond to test questions/instructions had greater difficulty following oral directions.

Conclusions

The results of this study demonstrated that learning disabled children became more dysfluent than normal subjects under specific conditions which increase speaker demands. There was a tendency for learning disabled children to produced more errors than normal subjects, but this was not statistically significant. These data are consistent with existing literature that suggests that learning disabled children tend to be more susceptible to speech and language disruptions under conditions of communicative stress than normal children. Consequently, certain kinds of stressful speaking situations may be predictive of speech and language disruption, and thereby useful as diagnostic indicators.

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