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THE ABILITY OF CHILDREN WITH SPECIFIC LANGUAGE IMPAIRMENT
TO COMPREHEND CONTRASTIVE STRESS IN SENTENCES

by Nicole M. VanCleave

INTRODUCTION

Children who are specifically language impaired experience problems in both the production and the comprehension of linguistic material. These problems cannot be explained by "emotional disturbance, hearing loss, deficits in oral motor function, or general intelligence" (Ellis Weismer, 1992, P. 125). Difficulties may be with phonology, morphology, syntax, semantics, or pragmatics. Problems processing or producing paralinguistic, or prosodic, information may also be evidenced. Such information includes rhythm, rate, intonation, pause, length, and stress.

Lexical stress is determined by a combination of three prosodic cues: higher pitch, greater intensity, and longer durational aspects than are present in non-stressed elements of speech (Highnam and Morris, 1987). The comprehension of stress is important as it aids in distinctions between new and old information, as well as highlighting elements of semantic and emotional importance (Bates, 1976; Bolinger, 1972).

Baltaxe (1984) stated that contrastive stress is a particular type of stress which is used to "contradict or replace some aspects of the listener's beliefs" (P. 98). Its placement

within an utterance relies upon pragmatic factors, and it serves to focus attention towards some specific linguistic parameter. Contrastive stress is frequently used in conversational discourse, and is often employed to resolve uncertainty or to draw attention to information which runs counter to presumed assumptions on the part of the listener. For example, the utterances "the **girl** put the ball in the cupboard," "the girl put the **ball** in the cupboard," and "the girl put the ball in the **cupboard**" each serve to highlight different decisions regarding linguistic units. Each of these may be cues into indeterminants or incorrect listener assumptions.

Recently, researchers have studied the ability of children with specific language impairment to produce various prosodic cues, including contrastive stress (Ellis Weismer, 1992). However, there is a lack of information about the abilities of such children to comprehend this information. The purpose of the present study is to examine the capabilities of children with specific language impairment to comprehend contrastive stress in a variety of sentences.

REVIEW OF THE LITERATURE

The development of suprasegmental knowledge in children with Specific Language Impairment is best studied in the context of considerations for children with normally developing linguistic skills. A recent study conducted by Loeb and Allen (1993) was designed to determine the ability of normally developing preschoolers to imitate the intonational contour

of a preceding adult utterance during an elicited sentence imitation task. Using experimental groups of three and five-year-olds, the evidence collected seemed to indicate that as a group, the children imitated or partially imitated the preceding adult-modeled intonational contour, with an increase in ability in direct correlation with an increase in age.

Normally developing children have also demonstrated abilities to produce linguistic stress patterns in preschool. Hornby and Hass (1970), using a description activity involving pairs of contrasting pictures, found typical children (age range 3-8 to 4-6) showed a clear tendency to stress the novel elements presented.

Limited studies of perception of stress have demonstrated that young children can detect differences, as well as produce these supra-prosodic differentiations. Studies of infant perception of stress by Spring and Dale (1977) demonstrated through a high-amplitude sucking paradigm that children as young as 1-4 months can discriminate between disyllables with contrasting stress patterns. Comprehension of stress, however, appears to develop with age, as Cutler and Swinney (1987) report in their findings which deal with response time to detection of target words. The study showed that children of about five years of age showed an adult-like response time to a target word manipulated independently of accent, while children under the age of five did not. Myers and Myers (1983) found in a developmental study of children (K-6) that ability to judge appropriateness of stress patterns of sentence pairs seems to

be a skill which matures even into adolescence. The suggestion here is that, while children readily perceive contrastive linguistic stress even in infancy, and appear able to produce it at young ages, the ability to comprehend such patterns do not develop until later.

Tallal (1976) found that children with language disabilities exhibit deficiencies in the ability to perceive temporal sequences of non-verbal signals. She hypothesized that such children have auditory processing problems, resulting in the abnormal perception of speech. Ellis Weismer (1992) suggested that manipulating the prosodic variables of a linguistic signal "could offer a means of reducing the processing demands of the language learning task such that SLI children could allocate more attentional resources to the new target form being acquired" (P. 125). Weinert (1992) tested the ability of SLI children to exploit prosodic cues in rule learning using a miniature language. She found that they had deficits in processing and using the rhythmic-prosodic structure of speech, and that the deficits covaried with their rhythmic ability as determined by a rhythm discrimination task.

Highnam and Morris (1987) compared the perception of contrastive stress of children developing language normally with those having SLI. Subjects were asked to judge linguistic appropriateness of pre-recorded pairs of question-answer trials, in one set providing for comprehension monitoring. The study found that children with SLI performed significantly lower than their age and gender matched normal language peers. But this

study did not address the auditory processing problems which many believe is a cornerstone of difficulty for SLI children, nor did it account for auditory memory deficits, which also play heavily into the linguistic problems of these children.

The present study was designed to determine whether children with SLI have greater difficulty perceiving contrastive stress in sentences than typical children matched for linguistic level and gender, by employing visual contexts through videotaped vignettes.

METHOD

Stimulus Materials. Eighteen video-taped vignettes and corresponding audio-presented sentences were pre-recorded for the experiment. The auditory material was recorded on a Panasonic stereo cassette deck, using a microphone in a sound treated room. Each sentence was spoken by an adult female, using a contrastive stress pattern with either the agent, the object, or the locative of each of five sentences. The resulting fifteen sentences were then analyzed for appropriate stress content by 5 adults, each listening to the sentences, and identifying which word was stressed. The sentences were judged with 100% agreement by each judge. The video-taped vignettes were created by using scenes depicting the aforementioned sentences. In one-third of the vignettes, the key variable was the agent who acted upon a common object in a specified location (the boy put the pillow on the bed instead of the girl). In one-third of the vignettes, it was the object that was

contrasted, while the actor and the location remained constant (the boy put the pillow, not the blanket, on the bed). In the remaining one-third of the vignettes, it was the location which was the deciding factor, with the agent and the object constant (the boy put the pillow on the bed instead of the chair). The vignettes were then randomized, with control for no depictions of the same scene neighboring. After each vignette, a blue screen was shown, and a semantically corresponding audio sentence was imposed upon the video. The sentences were randomized according to the variables of contrastive stress, with no more than two identical stress patterns in order.

Three training vignettes were created, as well. Each consisted of a video scene like those above, the first contrasting the agent, the second contrasting the object, and the third contrasting the locative. Each of these videos were followed by audio presentations of two lexically identical sentences, pre-recorded and accompanied by a blank screen with a green background. The first of each sentence pair contained appropriate contrastive stress, while the second did not.

Fifteen photographs were also created to examine subjects' ability to comprehend semantic content of the sentences. Three photos were created for each of the five sentences.

Semantic Assessment. Each subject was evaluated individually in his or her own school or home by the investigator in a quiet room. The child first completed the Grammatical Comprehension subtest of the TOLD-2, Intermediate (Hammill and Newcomer, 1988). Then the subject was told that they were going

to see some photos, and that they were to choose the one that went best with the sentence read by the examiner. The sentences were produced live by the adult female examiner, without the presence of contrastive stress. The five trials of three photos were designed to examine if the subjects were able to comprehend sentences used in the experimental procedure. This step was completed either prior to the presentation of the experimntal materials or following them, so as to counter-balance for order effects.

Training Session. The child was introduced to the training video with the following directions:

"I'm going to show you some short videos. After each one, you'll hear two sentences. Each of the sentences are true. But the sentences are said differently. One of the sentences goes better with the video than the other. You need to choose which one is best."

The subject then viewed the training video. After each vignette, the examiner asked the subject which sentence they thought went best with the video. In each case, the first sentence goes best with the video. After each of the first two trials, discussion was prompted by the examiner regarding the way in which the words were said, which words were the most important, and why. After the third trial, discussion was of a questioning nature by the examiner, to check for adequate concept comprehension.

Experimental Session. The experimental session consisted of a 15 point examination protocol. The following directions were read to the subject:

"You are going to see some short videos.
After each video you will hear one sentence.
All of the sentences are true. Listen to
the way each sentence is said. Pay close
attention to the video and the sentence.
Decide if they go together or not."

The subjects were then asked for a response following every trial of either "Yes--they go together," or "No--they don't go together." The scoring of answers was tallied by the examiner. The entire procedure required approximately 30 minutes to complete.

Subjects. Subjects in the experimental group were to have consisted of children between the ages of 8 years, 0 months and 12 years, 11 months. Each subject in this group was to have a measured performance IQ of at least 80 (or nonverbal equivalent), and hearing sensitivity within normal limits (ANSI, 1969). In addition, they were to have been identified by speech/language pathologists as demonstrating a year or more delay in receptive and/or expressive language ability on various standardized assessments. Those subjects that were to comprise the control group were children who had normal linguistic development. These subjects were to be matched pairwise to the experimental subjects according to gender and linguistic ability. The pairs were to be matched for language age within

10 percentile points on the Grammatical Comprehension subtest of the Test of Language Development-2, Intermediate (Hammill and Newcomer, 1988). The control subjects were to have been identified by classroom teachers as educationally normal. However, projected subjects were not successfully employed, due to circumstances and situations as described below.

RESULTS AND DISCUSSION

Two subjects matching the experimental criteria were evaluated. A girl, chronological age 9-7, and a boy, 10-4, were evaluated within their school environments, both considered to be Specifically Language Impaired and referred by school speech/language pathologists. Both children scored significantly lower than statistical averages on the TOLD-2 Grammatical Comprehension subtest, and both correctly identified the sentences during the photographic comprehension monitoring protocol. Both had some problems with the training video, and both responded at a chance level for the video assessment.

As this was an initial run, several options were considered based on the findings. The first option was that these students could not successfully complete the task because they have Specific Language Impairment, and therefore the test was still valid, even though these two subjects operated at the chance level. The second consideration was that the instructions were not clear, and that the students were unsure of what they were expected to do. The final concern was that the test was too difficult, and that it could not be completed by anyone.

In order to be certain that the test could be passed, the protocol was run on 10 adults, all who passed the test with 97-100% accuracy. Next, the test was run on two typical students, the first a nine-year old, and the second a six-year old. Both students achieved a high Grammatical Comprehension score, and both passed the comprehension monitoring task. However, the 9-year old student achieved only a 73% accuracy rating on the video assessment (chance level), and the 6-year old could not successfully complete the task. When these two students were interviewed following the examination, it was determined that they had answered the questions based upon truth determinations between grammar and the videos, disregarding stress patterns as influences upon semantic content.

In an attempt to rectify the problems, discussion surrounding the training video was lengthened, and more cues were given as to direct the students' attention to what the stress patterns were, and to help them realize that both sentences were true statements, though one went better with the video. These efforts did not help.

It was determined, as suggested by Myers and Myers (1983), that the comprehension monitoring skills necessary for the successful completion of this task have not been developed yet in children of the given age range. Possibilities for latency assessments, or judgement evaluations may be more reliable, and the present study may have some validity if administered to older students, but it does not effectively examine the skills of the age range it targeted.

Present findings demonstrate the need for more research of this venue. If, as Ellis Weismer (1992) suggests, prosody can be used as a tool by clinicians and educators to help children with SLI learn language more readily, then we must find out in exactly what ways this can be accomplished with students of varying ages, and we must be able to determine how contrastive stress can play a useful part.

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APPENDIX A

Comprehension Monitoring Task
Photograph Identification Stimulus Sentences

1. The boy put the pillow on the bed.
2. The woman picked up the book from the table.
3. The girl put the crayon in the cup.
4. The man put the banana on the plate.
5. The boy threw the ball out the door.

APPENDIX B

Video Assessment Stimulus Order

1. V: The boy put the PILLOW on the bed.
A: The boy put the PILLOW on the bed.
2. V: The woman picked up the book from the TABLE.
A: The WOMAN picked up the book from the table.
3. V: The BOY threw the ball out the door.
A: The BOY threw the ball out the door.
4. V: The man put the BANANA on the plate.
A: The man put the BANANA on the plate.
5. V: The boy put the PILLOW on the bed.
A: The boy put the pillow on the BED.
6. V: The GIRL put the crayon in the cup.
A: The GIRL put the crayon in the cup.
7. V: The WOMAN picked up the book from the table.
A: The woman picked up the BOOK from the table.
8. V: The man put the banana on the PLATE.
A: The man put the banana on the PLATE.
9. V: The boy threw the ball out the DOOR.
A: The boy threw the ball out the DOOR.
10. V: The boy put the pillow on the BED.
A: The BOY put the pillow on the bed.
11. V: The woman picked up the book from the TABLE.
A: The woman picked up the book from the TABLE.
12. V: The girl put the CRAYON in the cup.
A: The girl put the CRAYON in the cup.
13. V: The man put the banana on the PLATE.
A: The MAN put the banana on the plate.
14. V: The boy threw the BALL out the door.
A: The boy threw the BALL out the door.
15. V: The girl put the CRAYON in the cup.
A: The girl put the crayon in the CUP.

Key: V = Video vignette display
A = Accompanying Audio Sentence