

MISUNDERSTANDING OF CHILDREN'S SPEECH:
ITS RELATIONSHIP TO ARTICULATION CHANGE

Ralph L. Shelton
Cynthia Spier
University of Arizona
Tucson, Arizona

Marjorie Lewis
Sunnyside School District
Tucson, Arizona

Four and five year old children who inconsistently misarticulated /s/, the "r" family (/r/, /ʀ/, and /ʁ/, or both were asked "What?" contingent upon misarticulation of a target sound. Subjects' responses were sorted into categories including those in which the word containing the target sound was repeated and responses in which the target sound was used but not in the word questioned. Information was obtained about how frequently the children articulated the target sound correctly in words produced immediately after the questions and in other words.

The questioning procedure appeared to have little influence on the children's articulation. The procedure and results of the study are discussed relative to the development and assessment of cognitive techniques for establishing correct conversational use of sounds that children can but often do not produce correctly.

A viewpoint has evolved that development of mature phonological patterns can be enhanced by therapy of a conceptual nature. One clinical technique based on this viewpoint involves encouragement of better articulation by deliberate misunderstanding of children's misarticulated speech (Winitz, 1975; Weiner & Ostrowski, 1979). Another technique utilizes homonyms and phonemic contrasts to encourage the child to articulate correctly in order to express meaning (Bernthal & Bankson, 1980).

À des enfants âgés de quatre ou cinq ans qui mesarticulaient de façon intermittente les sons /s/ ou le groupe "r" (/r/, /ʀ/, et /ʁ/) ou les deux, on a demandé "Quoi?" suivant chaque mésarticulation du son visé. Les réponses des sujets ont été assorties en catégories, y inclus celles où le mot contenant le son visé avait été répété et celles où le son visé avait été employé dans un mot qu'on n'avait pas questionné. Des renseignements ont été obtenus sur la fréquence de l'articulation correcte du son visé dans les mots prononcés immédiatement après les questions et dans d'autres mots.

Le procédé des questions paraît avoir exercé très peu d'influence sur l'articulation des enfants. La méthode et les résultats de l'étude sont discutés par rapport au développement et à l'évaluation de techniques cognitives pour établir l'emploi conversationnel correct des sons que les enfants peuvent mais souvent ne réussissent pas à produire correctement.

Conceptual therapy is compatible with a cognitive view of language acquisition which holds that it is important to provide children with opportunities to discover mature language patterns through problem solving (Winitz & Reeds, 1975; Smith, 1978; McWilliams, Morris, & Shelton, 1984). Iwan and Siegel (1982), however, cited evidence which is reviewed below and which indicates that young children may lack the metacommunication skills necessary to reformulate expression upon occurrence of communication failure. This suggests that conceptual therapy techniques may at best be limited in the circumstances under which they are effective.

A number of studies indicate that the precision of speech varies with the need to convey information. Leonard (1971) presented a case study of a boy who inconsistently omitted final /z/. He found that final /z/ tended to be articulated correctly when its presence could convey a relatively large amount of information. Longhurst and Siegel (1973) reported that upon being misunderstood when speaking under adverse conditions, normal-speaking adults decreased their speaking rates and used longer descriptions and more redundant speech. Menyuk (1980) reported that language delayed children articulated meaningful material more accurately than nonsense utterances. She argued that misarticulating children alter their phonological patterns when they are motivated to speak intelligibly. Similarly, Campbell and Shriberg (1982) found that four processes that simplified children's phonological patterns were used less frequently in words that served as discourse comments than in words that served as discourse topics. Comment words were defined as carrying newer information than topic words.

Authors have also studied the effect of communication failure on articulation; the findings are contradictory. Weiner and Ostrowski (1979) and Weiner (1981) were successful in influencing articulation by providing children with information pertinent to the success of their communication. Their subjects were children from 3 to 5 1/2 years of age. Techniques used in these studies included (1) asking questions that repeated children's misarticulated words with correct articulation, with imitation of the child's misarticulation, or with a misarticulation that differed from that of the child and (2) use of a task in which the child had to name pictures correctly to succeed at a game. The game required the child to tell an adult which member of a pair of pictures to pick up. Word pairs used in the game were ordinarily produced by the child as homonyms; the homonymy resulted from the child's misarticulation. In the second study, therapy techniques in addition to those of a conceptual nature were employed.

Locke (1979) described responses of seven preschool children to a homonymy task similar to the one used by Weiner in 1981. Each child was presented with pictures containing target sounds, control sounds, and sounds the children substituted for the targets. For example, if a child substituted /s/ for /ʃ/, shoe contained the target sound, Sue the substitution sound, and blue the control sound or cluster. Each child was to name pictures under circumstances where a respondent had no cues to guide pointing responses other than the information conveyed by the subject's speech. The respondent's

pointing provided the subject with information about his or her communicative effectiveness. Four of the seven subjects showed no articulation gains in response to the task. Three children did show gains; however, two of those children were cued regarding the nature of their articulation errors.

Further evidence of a negative nature was obtained by Cimoral-Strong, Prater, and Krieling (Note 1). They responded to children's misarticulations by stating questions that repeated misarticulated words with correct articulation, with imitation of the child's misarticulation, or with a misarticulation that differed from that of the child. Few of the children's responses to those stimuli involved correct articulation. The subjects' responses did include phonetic alteration of non-target sounds, syntactic changes, and changes in intonation.

Additional results contrary to a beneficial effect for communication failure were reported by Iwan and Siegel (1982) who studied children performing a referential communication task. In that task, one child was to describe an object to a second child without naming it. The second child was to identify the object from the description. Subjects ranged from 45 to 63 months of age. They were studied for communication change in response to feedback indicative of successful and of failed communication. Greater change was associated with success than with failure, and expression following knowledge of earlier failure tended to be little more successful than the original failed trials. Again, Iwan and Siegel inferred that their subjects lacked the metacommunication skills necessary to improve their messages.

Gallagher (1977) and Gallagher and Darnton (1978) provided evidence that both normal and language disordered children responded to the question "What?" by revising the structure of their original utterances. Articulation change occurred. Children in each of the two studies cited were free from clinically significant misarticulation, and they were at one of Brown's (1973) three developmental language stages. For the eighteen children in the first study, language development was age appropriate whereas the twelve children in the second study presented expressive or receptive language one or more years behind chronological age. In each study, an examiner obtained a one hour spontaneous language sample from each child. During that period, the examiner asked "What?" every three minutes. The questions were not contingent upon any particular response from the child.

The children from each study made some articulatory changes in response to the questions. Most of these changes were consonant substitutions. Gallagher noted that the changes observed in the first study were not necessarily self-corrections. "Only approximately 50% of the phonetic change revisions in Stage I and Stage III children could be interpreted as closer approximations of the adult model; although the figure rose to 82% for Stage II children . . ."

The language disordered children at the three stages were similar in the proportion of their responses that involved phonetic change. However, the normal children at Stages II and III used phonetic change less frequently than did normal children at Stage I. Gallagher suggested that as language matures responses alternative to phonetic change are more readily available when communication failure occurs. The authors made no claim that the procedure they employed might be effective as a technique of articulation change.

Expectation of success in enhancing phonological patterns by alerting children to communication failure is not strongly supported by the literature cited here. While children often alter their speech in response to communication failure, it is not clear how or even whether to utilize that phenomenon to enhance development of articulation-phonology. The clinical success or failure of techniques alerting children to communication failure may depend on many variables including the age and speech and language patterns of the subjects and the extent to which the signal of communication failure is focused on a particular articulatory or phonological fault.

We assume that misunderstanding of a child's speech would be more likely to be beneficial to the child with a modest delay in the phonological use of sounds he or she can produce than it would to a child who appears to lack the means of producing the sound of interest. That assumption is supported by our experience with a child to whom we presented a task similar to that of Locke (1979); the child had to articulate words correctly to elicit a picture pointing response from an adult. The word pairs selected for training were produced by the child as homonyms. When the correct responses were within the child's phonetic capability but not part of his conversational sound pattern, he increased his use of those responses in conversation. However, when the technique was applied to contrasts involving a speech sound that he could not articulate correctly, he responded by using an articulation distortion to mark the distinction between the words.

The research reported here is directed to the descriptive assessment of a technique intended to alert children to communication failure associated with misarticulations. The technique involved asking the subject "What" contingent upon misarticulation of a target sound in spontaneous conversation. The seven normal preschool children who served as subjects were chosen because they inconsistently misarticulated /s/, the "r" family (/r/, /ʀ/, /ʁ/), or both which were to serve as target sounds. Each child was able to produce his or her target sound correctly and thus appeared ready to incorporate the target sound into the conversational speech pattern.

We report how often responses to the questions asked involved repetition of the word with the target sound. When the word questioned was not repeated, the subject's response was placed in one of three categories: (1) use of the target sound but in a word other than the one questioned, (2) a response that did not include the

target sound, and (3) no apparent response to the question. The results section reports the percentage of the target sounds that were correctly articulated when subjects responded to questions by repeating the word that contained the target sound. It also reports information about the percentage of correct articulations of target sounds in words that were produced in time intervals during which questions were not asked.

As is explained in the methods section which follows, four children received the question technique only. Because the technique was ineffective with them, the study procedure was altered. Three additional subjects were studied during a greater number of sessions. Prior to the final two sessions, these subjects were given information about why the questioning was being done. This information was conveyed through instructions that required the three subjects to listen to and produce the target sound. The procedural modification was intended to encourage subjects to respond to the "What?" questions by altering their articulation.

METHOD

Subjects

An investigator interviewed nursery school teachers to identify children who misarticulated /s/ or the "r" family. Children identified were then visited on the playground or in the nursery to confirm misarticulation. Parental consent for participation in the study was obtained for children who appeared to qualify as subjects. Testing was done at the next visit with the child, and play-conversation activity for data collection was conducted during subsequent sessions.

To serve as a subject, a child had to articulate correctly no fewer than 30 and no more than 70 percent of a 30 item /s/ or a 45 item "r" imitative sound production task. These tasks sample the target sound in different contexts (Arndt, Shelton, Johnson, & Furr, 1977). The "r" task included fifteen items each for /r/, /ɹ/, and /ʁ/. Each subject passed a pure tone air conduction hearing screening test at 20 dB for 1000 and 2000 Hz and at 25 dB for 500 and 4000 Hz. Each child also passed all four sections of the Denver Developmental Screening Test (Frankenberg, Dodds, and Fandal, 1970). Subjects were also selected to be of preschool age and free from any evident physical disability. Each subject had upper and lower central incisors and was free from any dental occlusion problem that would interfere with articulation of /s/, /r/, /ɹ/, or /ʁ/.

All sessions and speech samples were recorded on a Sony TC142 or a Uher 4000 tape recorder and played back through the same recorder plus a Realistic SA 102 amplifier and a Realistic 40-216 speaker.

Table 1 reports each subject's age, sex, and articulation performance on the Templin-Darley Articulation Screening Test and on a sound production task for the target sound. The scores were

obtained by a single observer who evaluated responses as they were elicited. Articulation responses were scored correct, questionable, or incorrect. Questionable responses were subsequently treated as incorrect. Derhotacization was classed as an error. Mean item by item percentages of agreement between the observer and a second observer working from recordings were 81% for the Templin-Darley (range 66-92) and 82% for the sound production tasks (range 67-93). Articulation responses evaluated during treatment were scored according to the criteria just described.

Table 1. Subjects' articulation scores on the 50 item Templin-Darley Screening Articulation Test and a 30 item /s/ or 45 item /r/ sound production task. Number and percentage of correct responses are reported.

Subject	Age	Sex	Templin-Darley	Sound Production Task			
				/s/		/r/	
1	4.1	M	29	(58%)	12	(40%)	
2	4.0	F	16*	(32%)		27	(60%)
3	4.1	F	37	(74%)	11	(37%)	
4	5.4	F	26*	(52%)		26	(58%)
5	5.4	F	36	(72%)		14	(31%)
6	5.0	M	29*	(58%)	20	(67%)	
7	4.2	M	26	(52%)	12	(43%)	

*Indicates the child was below the cut-off score on the Templin-Darley Screening Articulation Test.

Only three subjects failed the Templin-Darley Articulation Screening Test. None was considered to present an articulation disorder that warranted therapy. Each child sometimes produced his or her target sound correctly in conversation. But at the same time, each child misarticulated the target sound in conversational speech sufficiently often that room existed for improvement. Thus the children were considered to be good candidates for responding favorably to the procedures used. The children who misarticulated "r" tended to substitute /w/ for /r/ and vowels for /ʒ/ and /ʒ/; the /s/ subjects substituted /θ/ or dentalized /s/. Subject seven occasionally lateralized /s/.

Treatment

Each subject participated in play-conversation sessions on an individual basis. Materials used in the play included a Sesame Street Clubhouse and similar toys, books, paints, coloring books, and

Play-doh. The experimenter established a relationship with each child wherein they played together and talked about what they were doing or imagining. In the play-conversation sessions the examiner interjected "What?" as quickly as possible following misarticulation of the child's target sound. A minimum period of 2 1/2 minutes elapsed after a question before another misarticulation of the target sound was questioned. Then the first misarticulation of a target sound that occurred was questioned. No one word was questioned more than three times. No attempt was made to control the way in which "What?" was said by the experimenter. It was said in a manner compatible with maintenance of the play relationship with the child. A second observer used tape recordings to evaluate the articulation of target sounds in the words questioned. Average agreement between that observer's scoring and that of the experimenter working live with the children was 85% with a range from 58 to 100%. Information about the number of questions asked is reported in Table 2.

The first four subjects underwent two play-conversation sessions. After each session, the child was given a page from a coloring book to encourage future participation. As is reported below, the "What?" technique was ineffective. Consequently, the procedure was altered for use with three additional subjects.

The final three subjects participated in five play-conversation sessions plus two instructional sessions to encourage use of correct articulation and one or two additional play-conversation sessions. The instructional experience given the last three subjects between the fifth and sixth play-conversation sessions was intended to encourage their use of correct articulation in response to questions asked. Three lists of ten "r" words and three lists of ten /s/ words were assembled for use. Five words in each list began with the target sound, and the other five ended with that sound. Each word was pictured. First the examiner informed the subject that she had been asking "What?" because she couldn't understand the child when he or she didn't say /s/ or /ʒ/, whichever was the target sound, correctly. The child was told that he or she sometimes said the sound correctly and was then asked to imitate the sound five to ten times. Some of these responses were correctly articulated. The child was told which responses were correct. Following incorrect responses, the child was given suggestions about tongue placement and was asked to listen carefully to the models. Then the three lists of ten words depicting the child's target sound were presented to the child under each of four conditions: (1) the child was asked to listen to how the sound was produced as the examiner named each picture, (2) the examiner again named each picture, but this time the child repeated the names after the examiner, (3) the child was shown each picture and asked to name it without benefit of an auditory model, and (4) the child was asked to use each of the ten words to complete a sentence. These conditions were adapted from McLean (1970).

Advancement from list to list was not contingent upon any performance criterion since the purpose was to call the target sound to the child's attention not to establish its correct use. During

Table 2. Number of questions per session and percentage of responses to those questions that fell into four categories: (1) repetition of the word containing the target sound, (2) use of the target sound but not in the word questioned, (3) response that does not include the target sound, and (4) no apparent response to the question.

Subject	Number of questions per session		Percentage of trials in which word containing the target sound was repeated		Percentage of trials in which target sound was used but not in word questioned		Percentage of trials in which subject responded to question without using target sound		Percentage of trials in which subject appeared to ignore question	
	1	2	1	2	1	2	1	2	1	2
1	12	9	92	78	0	11	8	11	0	0
2	12	12	67	75	0	8	25	8	0	8
3	12	8	92	75	8	12.5	0	12.5	0	0
4	9	11	67	55	11	27	0	0	22	18
	<u>Mean</u>	<u>Range</u>	<u>Mean</u>	<u>Range</u>	<u>Mean</u>	<u>Range</u>	<u>Mean</u>	<u>Range</u>	<u>Mean</u>	<u>Range</u>
5	11.8	9-14	87.2	79-92	5.4	0-11	4.4	0-8	2.8	0-14
6	12.6	11-18	85.2	82-92	3.4	0-9	10.2	6-18	1.1	0-6
7	13.3	11-16	67.4	44-100	8.9	0-25	11.0	0-21	11.0	0-31

this procedure, the examiner said "good" or something similar each time a correct response was produced. Incorrect responses were ignored. After this instruction was completed and before each of the final two play-conversation sessions, the children were told: "We have been practicing the _____ sound in words. Now we are going to return to play with toys. Sometimes when I hear you say _____ in the wrong way, I'll ask you "What?'" The four steps were used with each target sound list on each of two days. The sixth play-conversation session was delivered immediately upon completion of the second instruction period.

The three subjects in the second part of the study were scheduled for two visits per week. However, because of absences from nursery school, the intervals between visits for the first two of these subjects were greater than planned. The study periods were 90 and 70 days each for subjects 5 and 6 respectively. The period for subject 7 was 15 days.

Table 2 reports information about how often each subject was questioned and about the percentage of responses to the questions that fell into each of four categories: (1) repetition of the word containing the target sound, (2) use of the target sound but not in the word questioned, (3) responses that did not include the target sound, and (4) no apparent response to the question. From eight to eighteen questions were asked each session, and a large majority of the responses involved repetition of the word containing the misarticulated target sound.

RESULTS

Table 3 reports the percentages of the target sounds that were correctly articulated in words repeated after questions. The data are based on a single observer who evaluated responses as they were produced. Mean percentage of agreement between that person and a second observer working from tape was 73 (range 50-100). Table 3 also reports the percentage of correct articulations of target sounds that occurred in unquestioned words. These scores are based on agreement of two of the three observers who evaluated the responses from tape. Mean percentage of agreement between the first and second observer was 74 (range 52-94). Neither the percentage of target sounds correctly articulated in repetitions of questioned words nor in unquestioned words shows any tendency toward improved articulation of any subject's target sound. The "What?" procedure was no more effective in extended treatment than in two sessions. Nor was it effective when used after instruction intended to inform subjects about its purpose.

DISCUSSION

In searching for treatment techniques for incorporation in a comprehensive articulation treatment method, we would not give priority to techniques that fail to provide short term change in the

Table 3. Percentage of correct articulations of target sounds in repetitions of questioned words and in unquestioned words.

Subject	Percentage of target sounds correctly articulated in repetitions of questioned words							Percentage of correct articulations of sounds in unquestioned words						
	Session							Session						
	1	2	3	4	5	6	7	1	2	3	4	5	6	7
1	50	40						18	47					
2	50	17						66	74					
3	38	33						6	6					
4	17	17						53	59					
5	27	--	50	70	33	57	--	*	*	50	39	47	75	--
6	44	33	67	36	56	36	23	29	17	10	28	22	23	75
7	21	0	0	0	0	0	25	16	42	9	32	25	9	32

*Tapes for first two sessions of subjects, 5 were lost

articulation of subjects selected as having the capability of responding correctly. The descriptive design of this study seems sufficient to demonstrate that the questioning technique employed did not elicit improved articulation in response to the questions asked. These results are incompatible with use of the "What?" technique as used in this study in therapy with patients similar to the individuals studied. However, it is possible that improvement occurred in target sounds as they occurred in specific linguistic categories. Campbell and Shriberg (1982) suggested that an individual's reaction to evidence of communication failure may depend on linguistic variables, such as sentence stress, that may constrain the child's speech production system. The design of this study did not provide for examination of that possibility.

We would not generalize from the negative results we obtained with the "What?" technique employed to other alerting techniques. Also, it is possible that the "What?" technique employed here would interact catalytically with other treatment techniques. Research is needed to test various techniques that are being recommended for clinical modification of phonological patterns.

Before initiating data collection, each person who participated in the evaluation of subject responses was given practice scoring articulation responses. Each observer established 75% or better agreement with the senior author. We consider the articulation scoring to be sensitive to the correctness of the subjects' articulation. Reliability tends to be reduced when correctness of response is marginal and inconsistent than it does when most responses are either correct or incorrect. For responses occurring during about 50% of the opportunities, observer agreement of about 55% is beyond chance level (McReynolds & Kearns, 1983).

The questioning procedure was conceptualized as presenting the subjects with a problem of communication failure that was to be solved. Perhaps the questions did not function as problems requiring solution; or perhaps subjects solved the problems with non-articulatory responses. The children were also observed to substitute words, delete words, and to expand utterances. Occasionally, the questions were ignored. The questioning procedure did not result in loss of access to toys and did not appear to disrupt the children's play. Perhaps had the procedure more severely impaired communication, greater articulatory change would have occurred.

Using questions to alert children to communication failure and hence to encourage more precise articulation might be more effective if the questions were structured to direct attention to particular characteristics of the patient's speech. For example, a question like, "Did your tongue stick out during [s]?" would direct the child's attention to articulation and to a feature of misarticulation. An open-ended "What?", on the other hand, may direct a child's attention away from articulation.

ACKNOWLEDGEMENTS

This report was completed while the senior author was a visiting professor with the Department of Speech Pathology and Audiology at the University of Alberta. The study was supported in part by grant number DE03350 from the National Institute of Dental Research, Department of Health and Human Services, U.S. Public Health Service. The authors thank the children and their parents and the following preschools for their participation: American Preschools, Amphitheater Preschool, Little Bear Preschool, and Mary Moppets Preschools. Special thanks for assistance go to Rebecca Butler, Anthony B. DeFeo, Megan Hodge, Anita Johnson, Patricia Kearns, Sandy Krieski, Rebecca McCauley, Heather Murphy, Marilyn Schmarcker, and Denyse Thomas.

REFERENCE NOTE

1. Cimorell-Strong, J., Prater, R. J., & Kreling, I. The effects of communicative failure on articulation revision behaviors. Unpublished paper.

REFERENCES

- Arndt, W. B., Shelton, R. L., Johnson, A. F., & Furr, M. L. Identification and description of homogeneous subgroups within a sample of misarticulating children. *Journal of Speech and Hearing Research*, 1977, 20, 263-292.
- Bernthal, J. E., & Bankson, N. W. *Articulation Disorders*. Englewood Cliffs, NJ: Prentice Hall, 1981.
- Brown, R.A., *First Language: The Early Stages*. Cambridge, Mass.: Harvard University Press, 1973.
- Campbell, T. F., & Shriberg, L. D., Associations among pragmatic functions, linguistic stress, and natural phonological processes in speech-delayed children. *Journal of Speech and Hearing Research*, 1982, 25, 547-553.
- Frankenburg, W. K., Dodds, J. B., & Fandal, A. W., *Denver Developmental Screening Test*, revised. Denver: University of Colorado Medical Center, 1970.
- Gallagher, T. M., Revision behaviors in the speech of normal children developing language. *Journal of Speech and Hearing Research*, 1977, 20 303-318.
- Gallagher, T. M., & Darnton, B. A., Conversational aspects of the speech of language-disordered children: Revision behaviors. *Journal of Speech and Hearing Research*, 1978, 21, 118-135.

Iwan, S., & Siegel, G., The effects of feedback in referential communication of preschool children. *Journal of Speech and Hearing Research*, 1982, 25, 224-229.

Leonard, L. B., A preliminary view of information theory and articulation omissions. *Journal of Speech and Hearing Disorders*, 1971, 26, 511-517.

Locke, J. L., Homonymy and sound change in the acquisition of phonology. In N. J. Lass (Ed.), *Speech and Language: Advances in Basic Research and Practice*, Vol. 2. New York: Academic Press, 1979.

Longhurst, T., & Siegel, G., Effects of communication failure on speaker and listener behavior. *Journal of Speech and Hearing Research*, 1978, 16, 128-140.

McLean, J. E., Extending stimulus control of phoneme articulation by operant techniques. ASHA Monographs Number 14. Washington: American Speech and Hearing Association, 1970.

McReynolds, L. V., & Kearns, K. P., *Single-Subject Experimental Designs in Communicative Disorders*. Baltimore: University Park Press, 1983.

McWilliams, B. J., Morris, H. L., & Shelton, R. L., *Cleft Palate Speech*. Philadelphia: B. C. Decker, Inc. (1984).

Menyuk, P., The role of context in misarticulations. In G. H. Yeni-Komshian, J. F. Kavanagh, & C. A. Ferguson (Eds.), *Child Phonology*, Vol. 1. New York: Academic Press, 1980.

Smith, F., *Understanding Reading*, 2nd ed. New York: Holt, Rinehart, and Winston, 1978.

Templin, M. F., & Darley, F. L., *The Templin-Darley Tests of Articulation*, 2nd Ed. Iowa City, Iowa: The University of Iowa, 1968.

Weiner, F. F., & Ostrowski, A. A., Effects of listener uncertainty on articulatory inconsistency. *Journal of Speech and Hearing Disorders*, 1979, 44, 487-493.

Weiner, F. F., Treatment of phonological disability using the method of meaningful minimal contrast: Two case studies. *Journal of Speech and Hearing Disorders*, 1981, 46, 97-103.

Winitz, H., *From Syllable to Conversation*. Baltimore: University Park Press, 1975.

Winitz, H., & Reeds, J., *Comprehension and Problem Solving as Strategies for Language Training*. The Hague: Mouton, 1975.

Requests for reprints should be sent to Ralph Shelton, Ph.D., Speech and Hearing Sciences Department, University of Arizona, Tucson, Arizona, U.S.A. 85721