FROM SYLLABLE TO CONVERSATION

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Preface

More than twenty years have passed since Robert Milisen and his associates (1954) completed the first serious study on articulatory behavior. At first the discipline was slow to respond, but in the early 1960's the pace began to quicken. As we look back it is difficult to imagine how research in the behavioral management of articulatory disorders could have been avoided, since our primary responsibility is to affect articulatory change.

Almost all of our constructs needed to be tested. Yet we failed to adopt the tools of the learning theorist. For example, we talked about the importance of discrimination training, but we never examined it. Strategies to reduce forgetting were never proposed. Acquisition and generalization were never tested.

This book is only a beginning, because we are only beginning to accumulate the facts. Nevertheless, it is time to assess what we know and how we can apply it.

From Syllable to Conversation examines each of the critical stages in articulatory training. First, the known facts are presented. Second, clinical applications are suggested. Third, clinical principles are given. At times I will move beyond the known, hoping that someday my proposals will be subject to empirical test.

This book is written for both students and professionals; students will have the opportunity to learn the origin of clinical routines, and professionals will have the challenge of matching their suppositions against mine. From all of this can only come progress and eventually a sturdy science on which the clinical management of articulatory disorders can rest.

Harris Winitz
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for Flora Sue, Simeon, and Jennifer, and all His children who use language as if they made it

Contents

CHAPTER 1

Searching for a Perspective

If there were no published works on the treatment of articulatory disorders, what operational procedures would one devise? Essentially this question was raised by the early writers of our profession. It was apparent to them that three major dimensions should be explored: a) evaluation of the disorder, b) background or cause of the disorder, and c) establishment of treatment procedures to reduce or eliminate the disorder. Each one of these areas of study does not lead to obvious solutions.

EVALUATION

Evaluation usually begins with description. We might, then, ask the question: How should we describe articulatory errors? This question is important because the descriptions we use will affect the way we evaluate and treat articulation disorders. One obvious system is simply to list the sounds in error and the error types.

Let us assume a child manifests the following articulation errors:

Correct sound	*Error sound*
/θ/	/t/
/ð/	/d/
/s/	/t/
/z/	/d/
/f/	/p/
/v/	/b/

We could simply stop at this point and ask no further questions. What basis would we have for treatment? We would know which sounds are in error as

well as the errors of substitution, but how would we proceed from here? A list of the error sounds does not tell us how to develop a training program; it only tells us which sounds are in error.

Early writers (Van Riper, 1939; Ainsworth, 1948) additionally recommended that error types should be catalogued. Usually, error types were partitioned as follows:

1. *Substitution:* one sound replaces another sound (/t/ for /k/)
2. *Distortion:* the target sound is altered slightly and is usually not regarded as a standard English sound (a lateral lisp for /s/)
3. *Omission:* the target sound is absent (pronouncing spill as /pɪl/)

At least two questions immediately emerge: What is the operational difference between substitution and distortion, and what value is this classification system?

Substitution versus Distortion

With regard to the first question, substitution and distortion, it can be said that the term distortion is usually employed to denote a substitution which is an uncommon English sound. Van Riper (1972, p. 187) takes this position when he says that "distortions are substitutions of sounds foreign to our language . . ."

A lateral lisp is often referred to as a distortion of /s/. Distortions can be described rather easily with phonetic symbols. A lateralized substitution is an /l/ which is voiceless, like the /l/ in the word slow, but made with considerably more frication. The standard phonetic symbol for the voiceless lateral fricative is [ɬ̥]. The little open circle below the /l/ indicates that the sound is voiceless.

The use of the term distortion implies more than a definition. It really involves an evaluation, and, therefore, points of disagreement are sure to surface regarding what is an approximation (a slight distortion) of an English sound.

Let us assume that a young child aspirates /k/ when it follows /s/. At this point we will define aspiration as a small puff of air following the release of /k/. Usually /k/ is aspirated in the initial word position and in several other environments, but never after /s/. Thus the pronunciation of [sk^{h}eɪt] for "skate" would be regarded as incorrect. Note that the ^{h} after /k/ means that /k/ is aspirated. Try saying it this way. Pronounce the /h/ in [k^{h}eɪt] with considerable aspiration, and at the same time place your hand in front of your mouth and you will feel a slight breath of air. The air cannot be felt when the word skate is uttered in its usual way.

Young children often aspirate /k/ after /s/ as they are learning English. Should we regard the k^h/k pronunciation as a substitution or a distortion? Does it really matter? It may depend upon what conclusions we wish to draw. This brings us to the second issue raised above, that is, the value of the classification system.

Classification

To my knowledge the categories of substitution, distortion, and omission are non-functional, in that their predictive value has never been tested. As of now, improvement cannot be prejudged on the basis of error type.

It would be relatively easy to examine the practical utility of these three error types if children could be found to fit these categories. Let us assume that we are able to find children who evidenced only one of the three error types for the /s/ sound. The following groups might be selected for investigation:

Group I: omission of /s/
Group II: lateral distortion of /s/
Group III: /θ/ substitution of /s/

Children in each of the three groups would then participate in a training program in which they would be taught to produce the /s/ sound correctly. From this experiment we would realize information regarding the relation between error type and the learning of /s/, the target sound.

Returning now to the example of the child's articulation errors given at the start of the chapter, we might consider descriptions other than error type. We might pay attention to the fact that the target sounds are all fricatives and the errors are all stops (plosives). It would seem, then, that only one phonetic feature is consistently being misused. Perhaps consistency of misarticulation is something to consider when we plan our program of instruction.

Other considerations that may influence the selection of treatment procedures relate to levels of performance. Can the child imitate one or more of the target sounds? Does his error type reflect a consistent substitution? Does he misarticulate only in sentences, but not in single words?

Evaluation as Data Gathering

The evaluation can be regarded as a data-gathering experiment. The information one seeks should be guided by the research findings of

carefully executed investigations. When there is no information clearly pertinent to the child or adult whom you are treating, you may wish to make observations in areas of your own personal experience. However, you would not want to make observations or administer tests in order to obtain information that clearly is not relevant or significant according to all of the available literature sources. Without research investigations, our evaluations would be intuitive and without principled direction.

BACKGROUND

In addition to studying the client's articulatory performance, speech clinicians often recommend that background information be made available to the clinician. A host of considerations at first seem important. These might include: a) health and personality of the client and his family, b) intelligence of the client, c) hearing and motor coordination of the client, and d) the social and educational background of the client.

This text is concerned with the mechanics of articulatory production for children who do not evidence an organic pathology. For this reason we will only briefly consider background or etiological considerations. Factors that should be included in an initial evaluation have been summarized previously (Winitz, 1969). In some instances the attitudes of parents should be assessed, as the research of Sommers and his colleagues (Sommers et al., 1964) suggests. When these attitudes are determined to be detrimental to a child's success, parental counseling is recommended. The social and psychological environments are important considerations when treating children with articulation disorders. The fact that this dimension is not covered in this text should not imply that it is unimportant.

Determining the cause of an articulation error, when an organic pathology is not present, is extremely difficult and in the past has largely proved to be non-productive. Discussions of causes are frequent (Van Riper, 1939, 1972; Winitz, 1969; Powers, 1971). In general, however, the available research does not point securely and easily to underlying etiologies of articulation disorders.

Articulatory Errors Resulting from Approximations

After an exhaustive search of many studies in this area (Winitz, 1969), I offered the tentative conclusion that articulation errors represent learned behavior. Several years ago I took the point of view that approximations become stabilized in the speech of young children. Children usually do not

pronounce words correctly when they are learning to talk. Some sounds are misarticulated, and syllables are often deleted.

There may be several reasons why children utter word approximations. One reason, which is treated in greater detail later, may be that words are used before phonetic mastery is complete. Having heard a word a relatively few times, a child may not be able to internalize all of the phonetic and phonological rules that govern it. Another possibility is that sounds must be practiced before they are perfected. If practice is essential, it seems reasonable to expect that the early utterances will be slightly off "target." With more practice, the target sounds will be acquired.

It is generally recognized that the early words of children (Lewis, 1951; Albright and Albright, 1958; Winitz and Irwin, 1958; Smith, 1973) are only approximations of the standard word. Listed below are word approximations observed by Smith (1973) in the speech of his two-year-old child:

Approximation	*Standard word*
[d̥ɛp]	stamp
[d̥ɛt]	tent
[g̊ɛu:]	thank you
[b̥igik]	biscuit
[ʌgu]	uncle
[b̥i:]	please
[nu:]	nose

The small open circle signifies devoicing of a stop normally voiced. Unlike the voiceless stops, these sounds are unaspirated and lax.

Approximations sometimes can end up as articulatory errors. Smith (1973) observed the occurrence of the lateral lisp in his son's speech as a substitution for the /sl/ blend at about two years, nine months. Up to this point the /s/ was omitted and /sl/ initial words began only with /l/ (e.g., [lʌg] for "slug"). The child's attempt to pronounce /sl/ correctly apparently led to the adding of frication and devoicing of /l/, resulting in [ɬ̊], the lateral lisp. This voiceless lateral fricative generalized almost immediately to all /sl-/contexts, but not to other /s/-consonant contexts, such as /st/ and /sm/. Shortly thereafter, the lateral lisp generalized to a few words beginning with /s/. As an example, we can trace the chronology of pronunciations for the word silver:

Pronunciation	*Age*
[wɪvə]	2 years, 5 months
[lɪvlə]	2 years, 7 months
[ɬɪvlə]	2 years, 9 months
[s̥ɪvlə]	3 years, 1.5 months
[sɪlvə]	3 years, 4.5 months

Almost immediately after [ɬ̥] appeared for /sl/ at two years, nine months, it replaced the initial /l/ in the word silver. The lateral fricative was retained for almost four and one-half months, or until three years, one and one-half months.

It is of interest to note that Smith's child pronounced /sn-/ clusters with an initial [n̥]. The [n̥], like the [ɬ̥], is a frequent substitution for /s/. In addition, Smith's son had a great number of substitutions for the /r/. Frequently observed were [w], [l], and [d]. All of these sounds are common substitutions for the /r/ sound.

Although there is no strong evidence indicating that articulatory errors emerge from approximations, there seems to be no way to dispute it at this time. If the findings obtained by Smith (1973) can be generalized, they suggest that the etiological foundation of articulatory errors can be easily traced to early sound substitutions. Why some children retain these errors, while others do not, is difficult to explain, although we have speculated that the explanation resides in the parent-child interaction and cannot be accounted for by etiologies housed within the child's brain and vocal tract.

Like Smith's child, other children have been observed to have sound productions that are variable. At times the target sound is correct, and at other times it is incorrect. The same is true of children with articulatory errors. In some phonetic contexts, they produce the sound incorrectly, and in others they produce the sound correctly. Sometimes, however, a few children consistently misarticulate a sound. In Chapter 2, we summarize the findings of an investigation by McReynolds and Huston (1971) demonstrating that, for sounds consistently in error, the phonetic features that make up the sound are usually uttered correctly when other sounds are considered. But more about this interesting study later.

There is general consensus that articulation errors are variable. However, there is no interpretation regarding the maintenance of errors that is affirmatively agreed upon by all. My interpretation is that inconsistency can be traced to early word approximations that have persisted. Perhaps the most obvious reason for the maintenance of errors can be found in the relationship between parent and child. A parent who listens without rephrasing error-filled sentences gives his child only half a chance. A parent who acknowledges understanding mispronounced words rewards incorrect pronunciations. Conceivably, then, the more tolerant the parent is of deviant speech, the more likely is the chance that his child will make no attempt to alter pronunciations.

I know scholars who pronounced the word et cetera as /ɛksɛtərə/ and did not alter this pronunciation until they were told it was incorrect.

External monitoring seems important especially when pronunciation becomes fixed after several years of use.

Value of Background Information

Let us now turn to the problem we hinted to above, the practical utility of the background information for children who evidence no organic pathology as determined by a physician. Assuming the information we have collected is accurate, we are faced with the responsibility to use it. If a child, for example, scores poorly on a motor test of rhythm or a test of social skills, we are obligated to do something about it, or we should not have sought the information in the first place. We might recommend certain motor exercises or prescribe a series of social readiness sessions. In practice, clinicians often disregard their own test taking. This routine is a curious fact, but it is fairly general across clinicians.

Often children with a number of articulation errors, seem normal in examinations given by psychologists and physicians. Even so, some diagnosticians frequently make one of the following two conclusions: a) the child seems normal in all respects except for his speech, or b) the child seems normal, but there are indications of minimal impairments. To be sure, these reports differ in interpretation, not in fact. In some settings, it is becoming fashionable to recommend that there are "soft neurological signs" rather than to admit that the expensive examinations have led only to a larger medical bill.

When our colleagues from other health professions recommend "minimal impairment" as a diagnosis, it is tempting to begin a series of in-house motor and social tests (see Winitz, 1969, Powers, 1971). If a child performs below average, it is also tempting to conclude that his score suggests an impairment or disability. Once we conclude that there is an impairment, we are obligated to treat it before training is initiated. If not, why conduct the tests?

Although many clinicians will not easily give up their determination to find a cause, they seem not to take their investigations seriously. Most of the time, they will go ahead and begin to modify the speech errors without regard to the findings of their evaluation, unless it is clear that a serious physical abnormality (cleft palate, cerebral palsy, etc.) or emotional disturbance (autism) exists.

Past investigations have demonstrated that, with the exception of measures of speech sound discrimination, articulatory defective children and normal speaking children perform equally well on tests of physical and

emotional maturity (Winitz, 1969). This point was highlighted in the introduction of a recent paper by Yoss and Darley (1974, p. 399), stating, "... the etiology of functional articulation disorders remains undetermined." We are in agreement with their position, yet it is a curious fact that this investigation by Yoss and Darley is prototypical of those that generate inconclusive statements. My only reason for singling out this paper is because it is recent and well done, except for an error in the selection of subjects. Poor control in the selection of subjects makes a good study turn sour.

Selection of Subjects

The Yoss and Darley investigation, like so many in the past, compares normal speaking and articulatory defective speaking children on a variety of speech and facial tasks. Among the tests included by the authors, three are listed below:

1. Isolated volitional oral movements: blowing, puffing of cheeks, whistling, and others
2. Sequenced volitional oral movements: imitation of sequences of oral movements, such as puckering the lips and wagging the tongue from side to side
3. Diadochokinetic rate: repetition of syllables and syllable sequences—/pʌ/, /tʌ/, /kʌ/, and /pʌ tə kə/

When differences are obtained between normal and defective speaking children on tasks similar to those used by Yoss and Darley, a number of interpretations can be offered. One simple interpretation is that there are maturational differences between the groups. Essentially this conclusion was drawn by Yoss and Darley (p. 412). They state, "The findings... lend substantial support to the use of the term 'developmental apraxia of speech' as descriptive of their articulatory problem." Apraxia can be defined as a loss in the ability to program the speech musculature for volitional productions of speech sounds. As we will soon see, the conclusion drawn by Yoss and Darley is untenable.

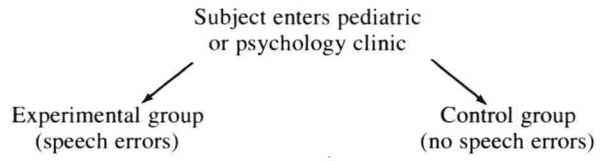
Another interpretation which can be made is that the neurologies of the two speaking groups are different. Yoss and Darley avoided this problem by saying (p. 411), " 'Soft' neurologic findings of uncertain significance or equivocal clinical importance do not imply a pathologic condition of the central nervous system, nor can one say that such findings imply minimal brain damage or minimal cerebral dysfunction." What do "soft" signs imply? To Yoss and Darley, they imply a developmental lag,

which apparently is not reflective of the integrity of the central nervous system.

Fortunately, we do not need to untie the knots that Yoss and Darley have woven, for their investigation suggests a second interpretation: The experimental subjects are basically different from the control subjects. We do not know the origin of the experimental subjects, only that they were screened at the well known Mayo Clinic. We are told that the subjects' articulatory productions "constituted a clinical, social, or academic problem or warranted enrollment in speech therapy" (p. 401).

The control subjects were carefully selected so as to resemble the experimental subjects, but it is not clear what procedures were used to select them. If they were taken from community schools, comparisons with defective speaking children would be unfair. The defective speaking children may have been brought to the Mayo Clinic for reasons in addition to their speech errors. They may have been representative of a population of children with learning disabilities. Perhaps the children had social and psychological problems.

Sketched below is the selection procedure for the ideal control and experimental group if the Yoss and Darley investigation were to be replicated:



If these procedures were routinely followed as subjects were assigned to the control and experimental groups, then differences that emerged could be attributed to basic differences in the subject population. At the present time, it is difficult to conclude that the experimental subjects evidenced retardation in isolated and sequenced volitional movements, inasmuch as it is possible that their low scores may have reflected social, psychological, and developmental dysfunctions.

TREATMENT

As indicated above, our discussion of treatment is restricted to the mechanics of articulatory modification. Procedures of modification are really speech tools that speech clinicians use to bring about change in the