

Articulatory Consistency and Variability in Apraxia of Speech

Anthony G. Mlcoch
West Virginia University, Morgantown, West Virginia

Frederic L. Darley
Mayo Clinic, Rochester, Minnesota

J.D. Noll
Purdue University, West Lafayette, Indiana

(Abstract)

The present study was born from the idea that much of what we know about the articulatory disturbance associated with apraxia of speech is based on the speaker's production of isolated words. With only a few notable exceptions, namely Deal and Darley's (1972) and Deal's (1974) use of oral reading, little is known about the apractic speaker's articulatory skills within various forms of contextual speech. The purpose of the present investigation was to determine the effects that three types of contextual speech had on three articulatory parameters; the frequency of error, the articulatory consistency or the speaker's tendency to misarticulate the same words across repeated trials of the same discourse; and the articulatory variability which refers to the apractic speaker's tendency to produce different errors in the same words and word positions across repeated contextual speech trials.

Six subjects with relatively pure apraxia of speech were asked to recite the "Pledge of Allegiance" (automatic speech task), orally read a 76-word passage (oral reading task), and describe a series of pictures (self-formulated speech task), three times under three experimental conditions. These conditions were a No Stress Condition in which the subject performed each task at his own pace, a Situational Stress Condition in which each task was performed in front of an audience, and a Communicative Stress Condition in which the subject was asked to perform each task at a supernormal rate of speech.

The subject's responses were tape recorded and later phonetically transcribed. Criterion measures of consistency and variability as well as frequency of error were derived.

The following results were obtained from this analysis:

1. The type of contextual speech task had no significant effect on the subjects' articulatory error frequency, consistency, or variability.
2. The subjects demonstrated a consistency as well as a variability effect in each of the three types of contextual speech. That is, the apractic speakers demonstrated both a tendency to misarticulate the same words across repeated trials while at the same time showing a tendency to produce different errors within the same words and word positions across repeated contextual speech trials.
3. Monosyllabic and polysyllabic words initiated by an easy or a difficult phoneme were produced with about the same frequency and degree of consistency over repeated contextual speech trials.
4. Articulatory errors in polysyllabic words were produced with more variability in the situational and communicative stress conditions in comparison with monosyllabic words produced in these same conditions.

5. The situational and communicative stress conditions had no significant effect on the articulatory parameters under study.
6. The frequency and consistency of apractic articulatory errors were positively and significantly related to the severity of the subjects' speech disturbance, while the degree of variability was not related.

The results indicate that while apractic speakers tend to misarticulate the same words, they also tend to produce different articulatory errors in the same words and word positions across repeated contextual speech trials. In addition, the lack of effect that the different forms of contextual speech had on the articulatory characteristics supports the idea that apraxia of speech is an articulatory disorder which is distinctly motoric in nature.

REFERENCES

- Deal, J. Consistency and adaptation in apraxia of speech. Journal of Communicative Disorders, 7, 135-140, 1974.
- Deal, J. and Darley, F.L. The influence of linguistic and situational variables on phonemic accuracy in apraxia of speech. Journal of Speech and Hearing Research, 15, 639-653, 1972.

DISCUSSION

- Q: Was your initial conclusion that because the context of the speech did not alter error rates that lends support to the model that apraxia of speech is more of motor or articulatory disorder?
- A: I would think that if you look at the three forms of contextual speech employed, automatic, oral reading, and self-formulated speech, that you have to make the assumption that each entails the actualization of different psycholinguistic processes. So, even though there are inherent differences within each form of contextual speech, these differences were not realized as affecting articulatory skills in apractic speakers. That supports the assumption that apraxia of speech is a motor disorder.
- Q: Would you say that your results would rule out a linguistic explanation since other researchers have shown that linguistic factors such as word position, grammatical class, etc., does effect the articulation of these patients?
- A: First, I did not assess the effect of these other factors, so I really cannot comment on how these affect the apractic speaker's articulation in contextual speech. Second, I do not think that my results rule out a linguistic explanation, since if other factors, such as the prosodic dimensions, were measured, perhaps a difference would have been found.
- Q: Other studies have shown that phonemic substitutions made by apractic speakers only varied within one or two distinctive features from the target phoneme. Why does your study indicate just the opposite?
- A: We did not look only at the phonemic substitutions made by the patient. We took into account other errors such as distortions, additions, repetitions, prolongations, and transitional errors when assigning a variability score. If we were to consider just the phonemic substitutions made, I am sure that we would have found what these other studies found. However, we looked at all the different types of errors made over repeated trials.
- Q: Who transcribed your tapes?
- A: The major author.
- Q: What did you say about the influence of length on articulatory performance?
- A: The length of the word did not have a significant effect on the articulatory skills of the apractic speaker.
- Q: Does the influence of length interact with the severity of the speech disturbance?
- A: We did not find that to be the case when looking at the data.
- Q: What was the time period between each condition?
- A: There was at least 4 hours between each condition.

- Q: Do you feel that site of lesion makes a difference determining whether apraxia of speech is present?
- A: This question was discussed among many members in the audience. There appeared to be a general consensus that the syndrome of apraxia of speech should be defined behaviorally, since many different sites of lesion result in apractic-like symptoms. That is, motor programming does not take place in one and only one neuroanatomical location. However, a segment of the audience did feel that it should be defined neuroanatomically.
- Q: Will you make a comment about the rate of speech across tasks?
- A: I did not measure rate of speech, but I think it would be interesting.
- Q: Do you have any sense that they were slower in one task in comparison to another?
- A: Their rate was faster in the automatic speech task. I did not feel there was a rate difference between the oral reading and self-formulated speech tasks.
- Q: Do you have any information about your subjects' early language abilities?
- A: Two of the subjects were pure apractic speakers post onset. The remaining four subjects were initially aphasic who later evolved into pure apraxia of speech.