

## Some Attempts to Make Vowels Behave Like Speech †

Shankweiler & Studdert-Kennedy (1967, in press) have demonstrated clear right-ear superiorities in the identification of contrasting initial consonants in dichotically-presented CVC syllables, with both synthetic and real speech. In the same experiments they found no significant ear superiorities in the identification of contrasting vowel nuclei. Pilot work has begun in an attempt to demonstrate a right-ear superiority for vowels.

Several of the variations of the Shankweiler & Studdert-Kennedy procedure which are being examined are based upon a relationship pointed out to the writer by J.J. Jenkins at Minnesota. Certain methods of scoring data from the dichotic-listening task, including the methods used in most published studies in the area and the method used by Shankweiler & Studdert-Kennedy, impose a mathematical upper bound on the magnitude of the maximum obtainable ear advantage. This bound varies inversely with the S's overall performance level. Since in the Shankweiler & Studdert-Kennedy studies the overall performance level was higher for vowel-contrast pairs than for consonant-contrast pairs, one might expect a larger measured ear advantage for consonants, even if both vowels and consonants are equally strongly lateralized. Further, in the Shankweiler & Studdert-Kennedy studies, response coding problems may have been present for the vowels, and not for the consonants. Clearly, any errors due to the S's difficulty in writing down what he hears will depress the overall score without

contributing to the measured ear-advantage. Errors from this source can make it appear that there is room for a sizable ear-advantage when in fact there is not.

Both these possible sources of bias were studied in pilot work. Ss were given training on writing down the vowel responses. They were then repeatedly tested in a dichotic listening task similar to that used by Shankweiler & Studdert-Kennedy with the following major differences. The test tapes used were only 60 items long (edited from the real-speech tapes used by Shankweiler & Studdert-Kennedy), and the test stimuli were played against various levels of (non-coherent) masking noise in order to depress the overall performance level.

Too few data have been collected to justify firm conclusions as yet, but the results are suggestive. For the 20 test sessions which have so far been run on the vowel test, 15 showed a right-ear advantage, 2 showed no difference, and 3 showed a left-ear advantage, indicating a fairly reliable overall right-ear superiority for vowels. Further, the two sessions in which no difference was obtained were sessions in which no noise was presented and the Ss made no errors on either ear (thus making it impossible to find an ear-advantage in either direction). This condition is the one which most closely resembles the task used in the Shankweiler & Studdert-Kennedy studies.

This pilot work is currently being replicated with a larger sample size.

An interesting phenomenon was discovered in the course of this work. The phenomenal experience of listening to CVC pairs which differ only in the initial consonant is very unlike that of listening to pairs which differ only in their vowel nuclei.

In the former case, the S typically reports hearing only one syllable. Sometimes the consonant reported is neither of the consonants presented, although the S's confidence in the veridicality of his perception in these cases tends to be high. When listening to syllables with contrasting vowels, the S typically hears two distinct syllables, and is able to report both correctly. This may be related to Shankweiler & Studdert-Kennedy's finding that "second preference" data contains less information for the consonant test than for the vowel test. Work directed toward understanding the mechanism behind this phenomenon is in progress.

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† This work was done while Mr. Halwes was a guest investigator at the Laboratories, and is being continued by him at the University of Minnesota.

#### References

- Shankweiler, D. P., & Studdert-Kennedy, M. An analysis of perceptual confusions in identification of dichotically presented CVC syllables. Paper presented at the 73rd meeting of the Acoustical Society of America, New York City, April 19, 1967.
- Shankweiler, D. P., & Studdert-Kennedy, M. Identification of consonants and vowels presented to left and right ears. Quart. J. Exp. Psychol. 19, 59-63 (1967).