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MONAURAL EAR DIFFERENCES FOR SAME-DIFFERENT REACTION TIMES TO SPEECH WITH PRIOR KNOWLEDGE OF EAR STIMULATED[1]

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Summary.—Morais and Darwin's (1974) finding of a right-ear advantage for speech on a "same-different" reaction-time task under monaural stimulation was replicated with 8 *Ss* who knew before each block of trials which ear would be stimulated. The effect cannot be accounted for in terms of a lateral bias in voluntary attention.

Using a "same-different" reaction-time task, Morais and Darwin (1974) found a 16-msec. right-ear advantage for "different" judgments, none for "same" judgments, under conditions where the critical information was presented monaurally. *Ss* were presented with two successive speech stimuli (consonant-vowel syllables, differing or not in the consonant), the first binaurally and the second to the left or to the right ear in an unpredictable manner. Since *Ss* were uncertain regarding the ear to which the second syllable would be presented, the possibility of a bias in the orientation of voluntary attention could not be discarded. The observed effect could result from attending more to the right ear than to the left one, even though the absence of asymmetry for "same" judgments does not seem to support this interpretation.

To clarify the nature of this right-ear advantage was made important by an experiment reported by Haydon and Spellacy (1974). Under conditions of ear-uncertainty, these authors found faster reaction times to both speech and non-speech sounds presented to the right ear than to the left. However, without ear-uncertainty, they found no effect.

If the laterality effect for "different" judgments observed by Morais and Darwin (1974) was not a result of a lateral bias to the right in the orientation of voluntary attention, one should expect to observe a right-ear advantage even when *Ss* knew in advance which ear would receive the second syllable. The present experiment was designed to test that prediction.

Method.—Eight right-handed *Ss* (1 male and 7 female, aged 18 to 26 yr.) were tested. Four of them had already been in the experiment reported by Morais and Darwin (1974). Each was tested for five sessions, payoff depending on speed and accuracy. Session 1 was devoted to training.

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On the tape were 120 pairs of successive synthetic speech CV syllables lasting 200 msec. and selected from among /ba/, /da/, /ga/, /pa/, /ta/, /ka/. It was identical to that of the replicated study, with the exception that the second syllable was recorded on track 1 only; the first syllable was recorded on both tracks. There was a silent interstimulus interval of 300 msec. between the two syllables of each pair. For half of the trials pairs were "different" and for half the "same."

In each session four blocks of 60 trials were given. In Blocks 1 and 3 the first half of the tape was used and in Blocks 2 and 4 the second half. One half of *Ss* responded "same" by moving a two-way switch toward their body and "different" by moving the switch away from their body. This instruction was reversed for the other half of the *Ss*. The responding hand was counterbalanced both within and across *Ss*. Within a block, the ear stimulated by the second syllable of each pair did not change. An equal number of blocks was assigned to the left and to the right ear by reversing the headphones after the first and the third blocks. The order of ear assignment of the blocks was also counterbalanced within and across *Ss*.

Results.—The interaction of ear $\times$ type of response was significant ($F_{1,7} = 8.91$, $p < .025$). For the "same" response, there was no effect for ear (left ear: 340 msec.; right ear: 342 msec.; $F < 1.00$). For the "different" response, RTs were in average 12 msec. faster when the second syllable was presented to the right ear than when it was presented to the left ear (left ear: 374 msec.; right ear: 362 msec.; $F_{1,7} = 17.20$, $p < .005$), and 7 of 8 *Ss* showed a right-ear advantage. There was no significant difference in this effect between the group of four *Ss* who participated in Morais and Darwin (1974) and the new *Ss* (respectively, 13 and 11 msec.). There was no effect for hand of response or hand of response $\times$ ear ($Fs < 1.00$). The "same" responses tended, with practice, to be faster than the "different" responses [type of response $\times$ session ($2 + 3$ vs $4 + 5$): $F_{1,7} = 7.12$, $p < .05$]; the advantage of the "same" responses increased from 21 msec. in Sessions 1 and 2 to 33 msec. in the last two. Concerning percent of errors, there was no difference between ears (respectively, 13.3% and 14.0% for the left and the right ear on the "different" responses).

The present results confirm that the right-ear advantage can be obtained under monaural stimulation on a "same-different" reaction-time task involving a simple phonetic judgment. They further argue against the possibility that the effect observed by Morais and Darwin (1974) resulted from a difference in the distribution of voluntary attention between the left and right ears.

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