

Feature Distance Effects in Spoken Word Recognition

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Some models of spoken word recognition assume that the phonetic segments of a word are composed of distinctive features. A match between a feature detector and feature information in the acoustic signal increases the chance of identifying the phonetic segment. If only some of the detectors for a segment match, the chances of identifying the segment drop. Pairs of segments differ in the number of features they share, e.g., /n/ and /l/ differ by just one feature whereas /n/ and /w/ differ by four. One would stand a better chance of correctly identifying /n/ if it were mistakenly replaced by /l/ than if it were mistakenly replaced by /w/.

The present experiment tested the hypothesis that the greater the feature distance between a target segment and a replacing segment, the poorer the chance of correctly identifying the target segment.

Nonwords were created such that changing one segment produced a real word while changing a different segment produced a different real word. Participants first heard the nonword and then the sound in the nonword that they were to change, e.g., for *sonvent* they heard /n/. If they replaced the /n/ with /l/ (*solvent*), they correctly retrieved the intended word. In a second condition, participants also heard *sonvent*, now followed by /s/ with the intended word being *convent*. /n/ and /l/ differ by one distinctive feature, but /s/ and /k/ differ by four, so we predicted that *convent* would be retrieved less often than *solvent*. Target pairs were balanced for word frequency, length, uniqueness point, and number of neighbors. The participants heard 60 nonwords with instructions to replace the segment given them with another segment that turned the nonword into a word. Differences in target and replacing segments ranged from one to five distinctive features.

Responses were scored for errors. Participants making more than 50% errors were removed. When the target segment and replacing segment differed in one, two, or three features, participants made more errors with increasing feature distance, as predicted. However, four and five feature differences did not follow this pattern. Perhaps listeners simply discounted extensive target-replacement differences rather than attempting to use phonetic similarity to find the target segment.

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