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Lexical activation in spoken word recognition: Insight from the Pause-Detection paradigm.

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This study explores the sensitivity of a new on-line paradigm—Pause Detection (PD)—to lexical activity during spoken word processing. In PD experiments, listeners speed-detect 150-ms pauses artificially inserted in speech sequences. Although the task can, in theory, be performed without knowledge of, or attention to the linguistic content of the sequences, lexicality was found to slow down PD. In Experiment 1, pauses \{\text{P}\} inserted in multisyllabic sequences were detected more slowly after words (e.g., “camper\{\text{P}\}ton-dee-lo”) than after nonwords (e.g., “goomper\{\text{P}\}ton-dee-lo”), but the effect gradually decreased with longer stimuli. Lexical statistics revealed that the latency pattern was a function of the number of words compatible with the pre-pausal speech fragment. In Experiment 2, lexical inhibition was found to be greater after late-unique than early-unique words, in both short and long words. This result confirmed the task's sensitivity to lexical activity levels at the time a pause is encountered. Experiment 3 further investigated the relationship between PD latencies and lexical activity by probing latencies to pauses inserted after nonsense syllables contrasted on their lexical activity level. Pauses were detected more slowly when they followed a syllable compatible with many words (e.g., “tran\{\text{P}\}po-ri”) than when they followed a matched syllable compatible with fewer words (e.g., “dran\{\text{P}\}po-ri”). The differential lexical involvement between the two syllable types was confirmed in a "lexical judgement" experiment: Participants were faster in judging that a test syllable was the beginning of an English word when the syllable was high-activity (e.g., “tran”) than low-activity (e.g., “dran”). Furthermore, there was a negative correlation between PD latencies and lexical judgement latencies when all test syllables were considered.

Although the mechanism responsible for the task's sensitivity to lexical activity is still under investigation, PD appears to be a promising paradigm for studying on-line lexical processing because it operates as a gauge of lexical activity at the time a pause occurs. It also offers a number of features that are a welcome complement to existing paradigms: (a) it is an indicator of the total amount of activity in the lexicon as opposed to that of hand-picked tokens, i.e., it is a better analogy for global activity in computational modeling, (b) because the task is acoustic in nature, linguistic effects might provide an insight into the automaticity and modularity of speech processing, and (c) pause detection protocols can easily be transferred from speech to non-speech and from one language, or one language population, to another.