



POSTER SESSION ABSTRACTS

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P10, Cognition

Investigating phonetic sensitivity during lexical processing in the dog brain

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Several steps of speech processing are known to be present in the brains of non-human species, particularly dogs, including both low- (acoustic) and high-level (e.g., meaning-related) analysis. However, it is debated whether dogs have similar abilities to humans in accessing the phonetic details of words during lexical processing. While a behavioural study has suggested that dogs may assign a meaning-changing role to a single speech sound in a word, an electroencephalography experiment has found no evidence for it. It is also unknown whether the previously identified brain areas involved in lexical processing are sensitive to the phonetic details of words. The aim of the present study was to investigate phonetic sensitivity during lexical processing in the canine brain. Twenty awake, unrestrained dogs were presented with (1) commands, (2) phonetically similar (differing in only one vowel) and (3) dissimilar nonsense words, while the elicited brain activity was measured using functional magnetic resonance imaging. In a whole-brain analysis, we found extensive bilateral auditory cortical activity when comparing all vocal stimuli to silence. Using region of interest analyses, we also found that within certain brain areas known to be involved in lexical processing, the commands and their phonetically similar forms were processed differently than dissimilar nonwords. However, the activity elicited by words and phonetically similar words did not differ. These findings confirm the presence and localize lexical representations in the dog auditory cortex, but also shed light on the limited capacity of these brain areas to access the phonetic details of words.

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