

# Intelligibility of monosyllabic words produced by an acoustically-driven model of the vocal tract

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A model of speech production is a tool that can provide insight into the relation of articulatory processes and acoustic characteristics present in a speech signal. When such a model includes components representing the voice source, acoustic wave propagation, and vocal tract movement it can produce actual speech that can be listened to and evaluated as if it were produced by a human. In this case it is useful to conduct formal listening experiments based on the output of the model as a measure of the degree to which speech production has been realistically represented. In this study, a recently developed model of the vocal tract was used to produce speech at the word level (Story & Bunton, 2017). What is unique about the model is that vocal tract movements are produced by directly specifying acoustic events rather than articulatory events. The aim of this study was to determine the *intelligibility* of a set of monosyllabic words produced by three different versions of this vocal tract model. The first version was a simulation of an adult male talker, whereas the other two versions were scaled to be representative of a 5 year-old and a 10 year-old talker. [Research supported by NIH R01-DC011275, NIH R01-DC006282, NSF BCS-1145011]