

ACOUSTICS2008/3155**A comparison of task and non-task related variability in speech production and acoustics, with implications to speech perception**

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Task Dynamics provides a way of testing whether production goals are acoustic or articulatory. According to this theory, during the production of a segment, the vocal tract can be divided into locations where a task is specified and locations where no task is specified. The goal is for articulators to synergetically achieve the constriction in the task location. Articulatory variability in the non-task locations is permitted due to overlap. However, articulatory activity in both task and non-task locations affects the area function and acoustic output. Therefore it is possible that an articulatory synergy stabilizes an articulatory task variable, without stabilizing the acoustics, evidence that the goal is articulatory. An experiment on the articulation and acoustics of /Vd/ in American English by 26 subjects, using the Wisconsin Xray Microbeam database, shows that there is a synergy between jaw and tongue tip that explains 79% of the variability in articulator locations. This synergy stabilizes the position of the tongue tip in the alveolar region. But the formant transitions and bursts are highly variable, since the back of the tongue and jaw assume positions consistent with the preceding vowel-evidence that the goal is articulatory (Funded by NIH DC-02717).