

The structure of variability in speech production

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Natural variability, or trial-to-trial variability, is referred to as the variance in the measurements of repeating a task when the external conditions are kept constant. Such variability in speech production has been largely attributed to noise in the central nervous system, and considered as random fluctuations, or the “error” in a statistical model, with an implication of being detrimental to the task. However, evidence has shown that trial-to-trial variability can also carry critical information of the task (e.g., Scholz and Schöner, 1999; Nam *et al.*, 2017; Sternad, 2018; Kang *et al.*, 2019; Kang, 2021). In this talk, I will briefly summarize our recent works on speech variability and related issues at Haskins Laboratories, including normality and central tendency of vowel production (Whalen and Chen, 2019), comparison of articulatory and acoustic variability (Whalen *et al.*, 2018), systematically biased variability (Chen *et al.*, 2019a), physiologically-driven F0 variability (Chen *et al.*, 2019b), and dissecting benign vs. destructive variability (Nam *et al.*, 2017; Chen *et al.*, 2018; Kang, 2021).

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