

ACOUSTICS2008/2960 Landmark-Based Analysis of Sleep-Deprived Speech

Suzanne Boyce^a, Joel Macauslan^b, Ann Bradlow^c and Rajka Smiljanic^c

^aDepartment of communication sciences and disorders, University of Cincinnati, Mail location 0394,
Cincinnati, OH 45267, USA

^bS.T.A.R. Corporation, 54 Middlesex Tnpk, Bedford, 01730, USA

^cNorthwestern University, Department of Linguistics, 2016 Sheridan Road, Evanston, IL 60208, USA

The speech of sleep-deprived persons has been variously described as more "slurred" or "tired-sounding" than speech by the same speakers in a rested condition. Although sleep deprivation is a major focus of research for public safety and health reasons, there has been notably little research on the connection between sleep deprivation and speech. Using an automatic system for detecting "landmarks", i.e. important perceptual and articulatory events in the acoustic signal, we compared sleep-deprived and rested speech recorded during two well-controlled studies of sleep deprivation. Our results show that sleep-deprived speech is significantly different from rested speech for both the number and pattern of landmarks detected. These results are similar in detail to differences previously found between clear and conversational styles of speech. The relevance of these findings for speech as a marker of sleep-deprivation will be discussed, along with potential applications in public safety and health. [Research supported by NIH.]