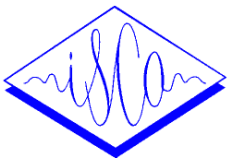

ITRW on Temporal Integration in
the Perception of Speech
Aix-en-Provence, France
April 8-10, 2002

P1-14

Acoustic Cues to the Perception of Initial Voicing in Hebrew

R. Taitelbaum, L. Kishon-Rabin and M. Hildesheimer
Department of Communication Disorders, Sackler School of Medicine, Tel Aviv University, Israel
rikit@netvision.net.il, lrabin@post.tau.ac.il, hildeshe@post.tau.ac.il

Very few studies investigated systematically the acoustics of voicing in Hebrew in either *production* or *perception*. In the one published study, Hebrew speakers were found to *produce* a long voice onset time (VOT) lead of –90 ms for voiced plosives and a short to intermediate VOT lag for voiceless ones (+30 ms). Based on these data it was assumed that for *perception*, Hebrew speakers use different categories of VOT for the voice-voiceless distinction compared to English speakers. This however has not been substantiated empirically. Furthermore, while VOT is found to be the primary cue to the perception of voicing in many languages (English included), it is not clear whether this is true for Hebrew. Other known acoustic cues to voicing such as F1 transition and the initial burst may serve as secondary cues as well. The purpose of the study was twofold: (1) to investigate the acoustic cues to the perception of voicing in Hebrew, and (2) to measure the relative weighting of these various acoustic cues. Four stimuli were constructed from naturally produced /bar/ and /par/. The first two consisted of the /b/ burst combined with the vowel of either /bar/ or /par/ and the remaining two consisted of the /p/ burst combined with the same vowels. For each stimulus a VOT continuum was created which varied from –50 to +50 ms in 10 ms steps. Adults with normal hearing and speech were tested using a two alternative forced choice labeling procedure. Results show that the phonemic boundary for VOT in Hebrew varies from a group mean of –16 msec to +10 msec depending on the additional available cues. When the stimuli consisted of vowels and transitions of the voiceless plosive, listeners require longer VOT leads (-16 msec) in order to perceive the plosives as voiced. On the other hand, when the acoustic information includes cues of a voiced plosive, lagging VOT (+9.8 ms) is required to perceive the plosive as voiceless. The finding that the VOT phoneme boundaries shift depending on the acoustical information in the vowel and burst of the stimulus suggests that VOT by itself is not the sole cue for voicing in Hebrew. Finally, the range of phonemic boundaries found in this study suggests that in general very short lags or leads are required for the perception of Hebrew voicing. This suggests different VOT categories in perception and production in Hebrew.