

## Linguistic Context Effects in the Speech Perfection of Malay-speaking Normal Hearing Young Adults

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### ABSTRAK

Kajian ini dilakukan ke atas penggunaan kiu linguistik di kalangan penutur natif Bahasa Melayu dewasa muda serta berpendengaran normal. Seramai sepuluh mahasiswa Universiti Kebangsaan Malaysia menyertai kajian ini dengan purata ambang pendengaran bagi keseluruhan telinga kiri dan kanan ialah 7.8 dB (SD 4.1). Ujian ayat pendek Hearing in Noise Test Bahasa Melayu (MyHINT) digunakan sebagai bahan ujian dan diperdengarkan kepada subjek pada tahap lebih kurang 65 dBA. Ujian dijalankan dalam medan bebas pada tiga keadaan berbeza: dalam senyap, dalam bising dengan nisbah signal-kepada-kebisingan (SNR) +5 dB dan 0 dB SNR. Bagi setiap keadaan, tiga senarai ayat MyHINT diperdengarkan kepada subjek. Magnitud penggunaan pengetahuan linguistik diukur dengan menggunakan faktor  $j$ , yang diperolehi dengan mengukur kebarangkalian mengenalpasti keseluruhan ayat ( $P_w$ ) dan kebarangkalian mengenal pasti perkataan di dalam ayat ( $P_p$ ) di mana  $j = \log P_w / \log P_p$ . Semua subjek memperoleh keputusan 100% dalam mengenalpasti keseluruhan ayat dalam keadaan senyap. Pencapaian subjek dalam keadaan 0 dB SNR lebih rendah secara signifikan berbanding dalam keadaan senyap dan +5 dB SNR ( $p < 0.001$ ). Nilai  $j$  mempunyai korelasi positif yang signifikan dengan  $P_p$  ( $r = 0.515$ ,  $p = 0.029$ ). Penggunaan kiu linguistik di kalangan subjek di dalam keadaan bising tidak berbeza antara satu sama lain [ $F(9,7) = 1.34$ ,  $p = 0.359$ ]. Nilai jangkaan  $P_w$  dikira dengan menggunakan fungsi regresi linear bagi  $j$  ke atas  $P_p$ . Korelasi di antara nilai jangkaan dan nilai sebenar  $P_w$  yang diukur adalah sangat tinggi ( $r = 0.973$ ,  $p < 0.001$ ). Keputusan kajian mencadangkan bahawa secara umum penggunaan kiu linguistik menjadi lebih penting bagi subjek berpendengaran normal apabila keadaan mendengar menjadi lebih sukar untuk memahami pertuturan.

**Kata kunci:** Kesan pengetahuan linguistik, subjek berpendengaran normal, persepsi pertuturan, mendengar dalam bising.

### ABSTRACT

The study examined the use of linguistic contextual cues among native, Malay-speaking normal hearing young adults. Ten undergraduate students of Universiti Kebangsaan Malaysia participated in the study. All subjects had normal hearing with the average hearing threshold levels for the overall left and the right ears of 7.8 dB (SD 4.1). The Malay Hearing in Noise Test (MyHINT) materials were employed and presented to the subjects at an approximately 65 dBA presentation level. Testing was conducted in a sound field in three different listening conditions: in quiet, in noise with +5 dB signal-to-noise ratio (SNR) and 0 dB SNR. In every test condition, three lists of MyHINT were administered to each subject. The magnitude of context effects was measured using the  $j$  factor, which was derived from measurements of recognition probabilities for whole sentences ( $P_w$ ) and the constituent words in the sentences ( $P_p$ ) in which  $j = \log P_w / \log P_p$ . Results showed that all subjects scored 100% identification of words in sentences and whole sentences in quiet listening condition, while subjects' performances in 0 dB SNR were significantly poorer than that in quiet and in +5 dB SNR ( $p < 0.001$ ). The  $j$ -values were significantly correlated with the probability of recognizing words in the sentences ( $r = 0.515$ ,  $p = 0.029$ ) in which lower  $j$  values were associated with lower  $P_p$ s. Subjects were not significantly different from each other in their use of contextual cues in adverse listening conditions [ $F(9,7) = 1.34$ ,  $p = 0.359$ ]. Using the linear regression function for  $j$  on word recognition probabilities, the predicted  $P_w$  were calculated. It was found that the predicted and measured probabilities of recognizing whole sentences were highly correlated:  $r = 0.973$ ,  $p < 0.001$ . The results suggested that linguistic contextual information become increasingly important for recognition of sentences by normal hearing young adult listeners as SNR deteriorates.

**Key words:** linguistic context effects, normal hearing listeners, speech perception, hearing in noise.