Sentence Comprehension under Syntactic Ambiguity: A Study of Processing Speeds in Native and Non-native English Speakers

Keywords*:* Garden-path sentences; Sentence comprehension; Reaction times; Accuracy levels; Grammatical sentences

This comparative study explored the reaction times and accuracy levels of groups of native speakers of English and German, non-native speakers of English, both between- and within-groups, through an on-line experiment using PsychoPy to record the precise time of the individuals' reaction through their responses. In this vein, two equal groups of subjects were recruited to participate in this study, employing a convenience sampling and the study focused on the behavior of native and non- native speakers of English who do not have similar language backgrounds. It aimed to find out how fast and accurate these two groups of participants would process, comprehend, and finally react to three types of sentences, namely 1) garden path sentences, 2) ungrammatical sentences and 3) grammatical sentences. The stimuli of this study were formulated mostly based on certain features that are different between the first language, English, and the second language, German. It lent itself to the hypotheses that there would be a significant distinction between the two groups as these two languages are not similar typologically. It was expected that native English speakers would react faster to the stimuli and respond more accurately, in comparison with the non-native participants. On the contrary, the non-native speakers would spend a great deal of time processing the stimulus sentence.

The study is important as not much research has yet been conducted on garden-path sentences between two groups of English natives and German, non-native speakers of English in real time. Additionally, it sheds new light on the difficulty that these two groups of speakers of English have in processing and understanding garden path sentences, such as *The youth fashion patchwork from cloth*, and ungrammatical sentences as the syntactic representation of German subjects is not quite similar to English native speakers. To this end, the participants were asked to react to the sentences displayed on the screen as quickly and accurately as possible. Moreover, they were asked to answer the true or false comprehension questions followed by garden-path sentences to measure the accuracy level of the replies and test the comprehensibility of the participants.

Mixed between-within subjects analysis of variance was utilized to analyze the data and the results indicated that native and non-native groups performed, statistically, similar to each other in comprehending and reacting to the sentence types ($F_{(2,21)}$= 1.90; P= 0.175, η_2 = 0.15, large). In contrast, it was observed that the participants, within-group, comprehended and reacted strikingly differently in each type of sentence, i.e., longer in garden-path, ungrammatical, and grammatical sentences, respectively. The results of Bonferroni post-hoc test indicated that the mean difference between the garden-path and ungrammatical sentences was significant (P=0.001). Similarly, the mean difference between garden-path and grammatical sentences was significant (P=0.001). Whereas there was no significant difference between the ungrammatical and grammatical sentences (P=0.51).