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Does Orthography Influence Location Learning of Menu-Driven Computer Interfaces?

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To date most studies on location learning of menu-driven computer interfaces have been focused on the influences of label representativeness and the influences of practice. Little attention has been given to the potential influences of the orthographical characteristics of text labels. This research aims to investigate the issue by comparing location learning of Chinese menu items and location learning of English menu items.

Chinese was singled out to be compared with English, not only because Chinese is a widely used language, but also because there are two pertinent orthographical differences between Chinese and English:

1. Written English consists of word strings that differ in form, in height, and in length, whereas written Chinese consists of characters constructed from strokes in a uniformly square-shaped area. It is conjectured that the varying word shapes of written English act as contextual cues (Chun, 2000) that facilitate location learning. In contrast, the unvarying word shapes of written Chinese provide little or no such facilitation.

2. Written Chinese is, in general, visually more complex and spatially denser than written English. It is conjectured that, compared with written English, the complexity and density of written Chinese imposes a higher perceptual load (Lavie, 1995), which in turn uses more attentional capacity and restrains location learning to a greater extent.

Taken together, it is hypothesized that users using a Chinese menu would learn the locations of menu items to a less extent, compared with users using an equivalent English menu.

A pilot experiment was conducted. The task was a self-paced menu selection task. Two equivalent textual menus, one in Chinese and one in English, were used. Both menus consisted of 10 menu items in a vertical layout. The words used to label the menu items were category names picked from a Chinese-English bilingual portal delivering electronic civil services of the Hong Kong's government. Each session comprised 15 blocks of 10 trials. Locations of menu items remained constant for the first 10 blocks. Across the 10th block and the 11th block, the locations of menu items were randomly permutated without prior notice. After that, the locations of menu items remained constant again for the remaining 5 blocks. Location learning of menu items, if any, would be reflected by upsurges of selection times across the 10th block and the 11th block.

Selection times of participants using the English menu surged across the 10th block and the 11th block ($t_6 = 4.72$, $p < .01$, $\eta^2 = .79$), indicating that location learning had taken place. In contrast, selection times of participants using the Chinese menu did not surge across the 10th block and the 11th block ($t_6 = 1.58$, $p = .17$, $\eta^2 = .29$), indicating that no significant location learning had taken place.

Future work will take account of task nature, menu organization, and ecological validity.

Acknowledgments

Referencess

Chun, M. M. (2000). Contextual cueing of visual attention. *Trends in Cognitive Sciences, 4*, 170-177.

Lavie, N. (1995). Perceptual load as a necessary condition for selective attention. *Journal of Experimental Psychology: Human Perception and Performance, 21*, 451-468.
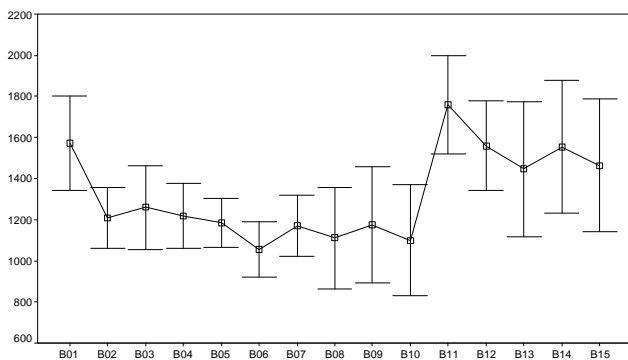
Figure 1. Mean selection times in milliseconds across 15 trial blocks under English menu condition. Error bars show 95% confident intervals.
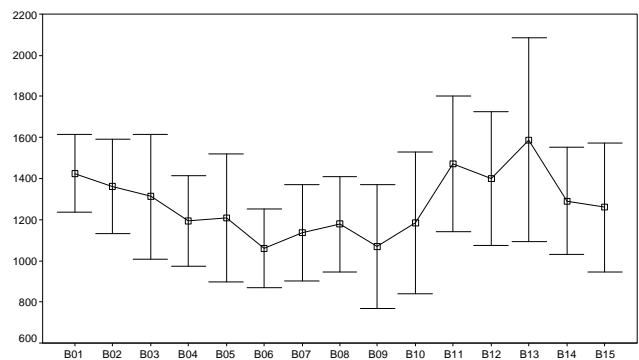

Figure 2. Mean selection times in milliseconds across 15 trial blocks under Chinese menu condition. Error bars show 95% confident intervals.