

A Study of Semantic Analysis of LED Illustrated Traffic Directional Arrow in Different Style

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Abstract : In the past, the most comprehensively adopted light source was incandescent light bulbs, but with the appearance of LED light sources, traditional light sources have been gradually replaced by LEDs because of its numerous superior characteristics. However, many of the standards do not apply to LEDs as the two light sources are characterized differently. This also intensifies the significance of studies on LEDs. As a Kansei design study investigating the visual glare produced by traffic arrows implemented with LEDs, this study conducted a semantic analysis on the styles of traffic arrows used in domestic and international occasions. The results will be able to reduce drivers' misrecognition that results in the unsuccessful arrival at the destination, or in traffic accidents. This study started with a literature review and surveyed the status quo before conducting experiments that were divided in two parts. The first part involved a screening experiment of arrow samples, where cluster analysis was conducted to choose five representative samples of LED displays. The second part was a semantic experiment on the display of arrows using LEDs, where the five representative samples and the selected ten adjectives were incorporated. Analyzing the results with Quantification Theory Type I, it was found that among the composition of arrows, fletching was the most significant factor that influenced the adjectives. In contrast, a "no fletching" design was more abstract and vague. It lacked the ability to convey the intended message and might bear psychological negative connotation including "dangerous," "forbidden," and "unreliable." The arrow design consisting of "> shaped fletching" was found to be more concrete and definite, showing positive connotation including "safe," "cautious," and "reliable." When a stimulus was placed at a farther distance, the glare could be significantly reduced; moreover, the visual evaluation scores would be higher. On the contrary, if the fletching and the shaft had a similar proportion, looking at the stimuli caused higher evaluation at a closer distance. The above results will be able to be applied to the design of traffic arrows by conveying information definitely and rapidly. In addition, drivers' safety could be enhanced by understanding the cause of glare and improving visual recognizability.

Keywords : LED, arrow, Kansei research, preferred imagery

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