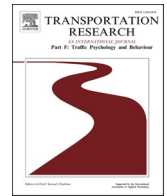




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Short communication

## Ergonomic principles of road signs comprehension: A literature review

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### ABSTRACT

Road signs are an essential component of a safe driving environment. Understanding road signs is vital to road safety. This paper reviews many earlier investigations into how well drivers understand road signs, considering ergonomic principles. Articles from 2012 to 2023, indexed by Web of Science, Scopus, Google Scholar, IEEE, Semantic Scholar, Science Direct, Cambridge Core, and JSTOR, were used to evaluate the literature on ergonomics and road signs comprehension. The analysis reveals that some evaluation techniques have been created to measure how well road signs are understood. Based on International Standard Organization (ISO, 3846 and 39001), 268 road signs were reviewed out of which, 112 (41.79 %) road signs are associated with lower comprehension scores and may pose a higher risk to road users who many not fully understand their meaning. 156 (58.21 %) road signs associated with higher comprehension scores and likely understood by road users. In conclusion, human traits, cognitive sign design and ergonomic principles are crucial for understanding and producing road signs. It was suggested that applying ergonomic ideas to the design of road signs can increase user comprehension.

### 1. Introduction

Ergonomic problems exist in numerous aspects of life; one such aspect is transportation, specifically the road. However, during the transportation of goods and services from origin to destination, unavoidable consequences result in the loss of lives, body parts and properties, known as road accidents (Mustapha et al., 2022). Studies have shown that the rate of these road accidents is relatively high, which is caused because of mechanical, environmental, and human factors. The human factor constitutes about 90 % of road accidents (Zarei et al., 2019). Per this percentage, drivers' action or reaction makes up 90 % (Idris & Mustapha, 2019). Drivers as road users are critical factors in road safety performance. Studies have shown that a critical contributing factor to road traffic accidents in Nigeria is the driver's attitude to driving codes and etiquette (Anene, 2022). Human errors can occur due to various factors, such as driver errors. They can also be caused by the failure of work systems and drivers to interact with each other effectively. Several road accidents occur because of the driver's nonchalant attitude when driving. Such attitude includes, among others, sleepiness, driving under the influence of drugs and/or alcohol, fatigue, faulty preparation, and ignorance of highway codes and road signs (Idris & Mustapha, 2019).

Road signs are instruments used to regulate road users' behaviour and the traffic flow using symbols, colours, and text (Idris &

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