World Academy of Science, Engineering and Technology
International Journal of Industrial and Systems Engineering
Vol:19, No:02, 2025

From Comfort to Safety: Assessing the Influence of Car Seat Design on Driver Reaction and Performance

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Abstract : This study investigates the impact of car seat design on driver response time, aiming to address a critical gap in understanding how ergonomic features influence both performance and safety. Response times have been measured using controlled driving scenarios under various seat design conditions. The key phases of this project include rigorous data collection and comprehensive analysis. Participants will interact with a range of seat designs while executing driving tasks, with objective metrics such as braking and steering response times being meticulously recorded. Advanced statistical techniques, including regression analysis and t-tests, have been employed to identify key design factors that significantly influence driver response times. Subjective feedback has been collected through detailed questionnaires and in-depth interviews to assess driver comfort and usability preferences. Qualitative data has been analyzed through thematic analysis to provide deeper insights into driver perceptions regarding seat design elements. The expected outcomes of this research include the identification of seat design features that significantly affect driver response time, as well as a deeper understanding of driver preferences for comfort and usability. The findings contribute to evidence-based guidelines for optimizing car seat design, ultimately improving driver response time, safety, and overall driving performance. This research holds significant practical implications for automotive manufacturers, designers, and researchers aiming to create safer and more ergonomically optimized car seats. By refining seat design to enhance driver response time, this study aims to improve both driver safety and the overall driving experience. The results will inform the automotive industry's efforts in designing car seats that enhance driver performance and contribute to improved road safety.

Keywords : car seat design, driver response time, cognitive driving, ergonomics optimization
Conference Title : ICAHFE 2025 : International Conference on Applied Human Factors and Ergonomics
Conference Location : Kuala Lumpur, Malaysia
Conference Dates : February 03-04, 2025