

# **Understanding users' characteristics in the selection of vehicle seating configurations and positions in fully automated vehicles**

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## **Abstract-**

**Objective:** To understand which users' characteristics influence their preferences in the selection of vehicle seating configurations and positions across different traveling scenarios involving a fully automated vehicle (FAV).

**Methods:** Participants (n=730) completed an online survey in which they were asked to imagine traveling in a FAV across three hypothetical scenarios. Participants were asked to select between five different seating configurations and four positions for each scenario and about their anthropometry and their driving/riding experience. Multinomial regression analyses were conducted to identify the factors that influenced users' preferences.

**Results:** FAV Configuration #3 (traditional light vehicle seating configuration) was the preferred seating configuration for 74% of the participants, followed by FAV #2 (in which the two seating rows face each other, 13%) in Scenario 1 (riding by oneself). Similar numbers were observed in Scenario 3 (riding with an unknown person). In Scenario 2 (riding with their partner), participants preferred FAV #2 (12.5%) and FAV #5 (in which the front seat passengers point toward a common point in the front, conventional rear seat configuration, 17.5%). Having close family was significant to choose the traditional vehicle configuration over other vehicle configurations, but only when the participants were driving by themselves. Having previously experienced motion sickness was significant to prefer a forward seating configuration when the trip was shared with partners. Belonging to a particular height or weight group was significantly associated with the preferred seat within the preferred FAV configuration (the driver's position in FAV #3; a rear-facing seat in FAV #2), although there was not a clear trend between increasing weight and/or height and preferring one seating position over the others.

**Conclusions:** Previous work had shown differences in participants' preferences for seating configurations and positions depending on age, sex and country. While increasing the sample size, the current study analyses other factors that were associated with choosing one vehicle configuration and seating position over others. As these factors are directly related to the likelihood of sustaining injuries in the event of a crash, the current study provides important insights regarding the potential risk factors for FAV occupants.

**Index Terms-** Seating configurations, seating positions, fully automated vehicles, autonomous vehicle

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