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Unveiling the Dynamics of Shared Autonomous Vehicle Acceptance: Insights into the General Acceptance Factor, Social Preferences, and Design Components

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Introduction:
The emergence of Shared Autonomous Vehicles (SAVs) represents a transformative shift in urban mobility. This shift may help alleviate cities' growing issues with urbanization and increased pressure on infrastructure. Automation in transport promise not only to redefine how we travel but also to significantly impact traffic safety. Understanding public acceptance of SAVs is crucial for their successful integration into the urban transport system. The current study investigates how to best measure public acceptance of SAVs and the role of the social situation arising within shared AVs. Understanding key concepts regarding trust, safety perceptions and utility are at the core of this research. This study's research aim is to develop a accurate and effective measure of intention to use SAVs.

Methods:
The study employed a large online survey targeting the general population of Norway during the summer of 2022. The total sample, after cleaning and screening, consisted of 1902 respondents. The survey was designed to include items from the UTAUT and MAVA frameworks, as well as items measuring social attitudes. Statistical analyses, including principal component analysis (PCA) and confirmatory factor analysis (CFA), were utilized to assess the relationships between these constructs and the overall willingness to use SAVs. The sample was split into two equal and random halves, conducting PCA on one and CFA on the other to enhance reliability.

Results:
We find that acceptance of SAVs can be categorized into four components: a general acceptance factor (GAF), interpersonal security, sociability, and attractivity. This is confirmed by CFA, but there is also room for better model fits in future research. The GAF is by far the most prominent predictor of willingness to use in a multiple regression model. The two social factors are also found significant. Furthermore, the GAF can be represented using only two factors: trust and usefulness. The first model including 23 items showed an R2 of .75, while the model using only two items still had a R2 of .71. This suggests room for substantial simplification in future research into acceptance of SAVs. It also highlights the importance of trust, safety, and utility as core aspects in people's perceptions of SAVs.

Discussion:

These results corroborate recent claims that intentions to use AVs and SAVs may be as well predicted by a single factor as by multiple. The current paper further suggests that this GAF could be adequately measured by as few as two items. This could be of great utility in future investigations where brevity and efficiency in measurement is of importance. We also find significant effects of social attitudes. This seems to be an important aspect of SAV perception, although not as important for willingness to use as other items. Our results align with previous research emphasizing the role of trust in technology adoption and highlights the need for stringent safety standards and transparent communication about safety features in SAVs, as well as travellers expected utility of the service.

As autonomous technology advances, continuous engagement with potential users will be crucial in addressing safety concerns and enhancing public trust, thereby facilitating smoother integration of SAVs into urban mobility systems.