

Background

- The United States trucking industry hauled around 11.46 billion tons of freight in 2022, making up 72.6% of the nation's total domestic tonnage shipped.
- Automotive experts predict that substituting human drivers, prone to errors and fatigue, with autonomous trucks (ATs) immune to these issues could significantly reduce crashes and fatalities, help transport goods over much longer distances and without the scheduled breaks required for human drivers, maximize revenues, and contribute more significantly to the nation's overall budget.



This study aimed to uncover public opinions on adopting APV technology in large trucks, emphasizing the influences of personal attributes on such opinions. The study intends to enhance our understanding of societal readiness for this technology in the trucking sector.

Data & Methods

This study utilized data from the Pew Research Center's nationwide survey, "Americans cautious about the deployment of driverless cars" Conducted from November 1 to November 7, 2021.

1,662 cleaned responses from a diverse participant pool

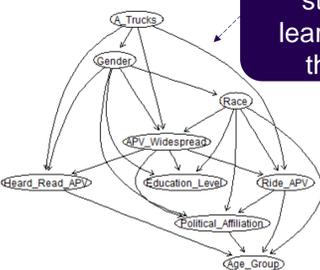
- Gender (man vs. woman)
- Race (White vs. non-White)
- Age (18-49; 50-64; 65+)
- Education level (some college courses or less vs. college or more)
- Political affiliation (Democrat vs. Republican)
- Knowledge about autonomous passenger vehicle (APV) technology
- Ride an APV (would vs. would not)
- Widespread use of APVs (bad idea vs. good idea)
- Use of APV technology for large trucks (Favor vs. Not favor)

Bivariate correlation analysis

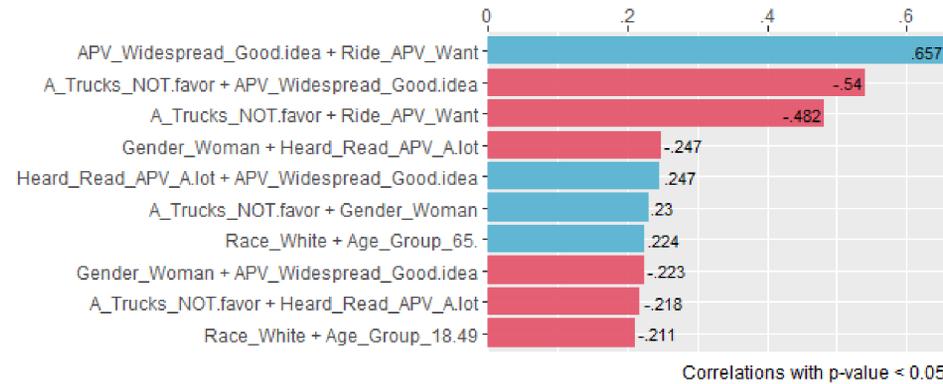
Initial BN structure learned from the data

Refined BN structure (expert knowledge)

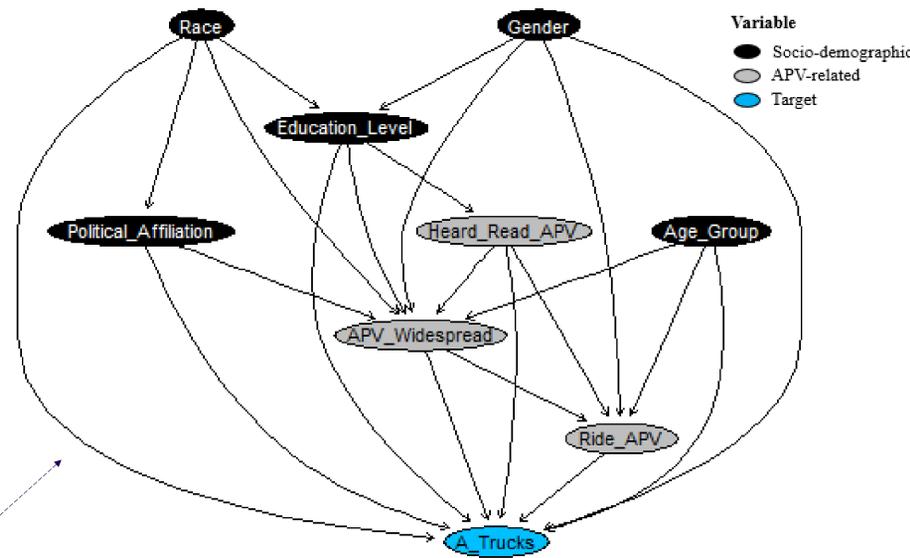
Results interpretation and way forward



Results



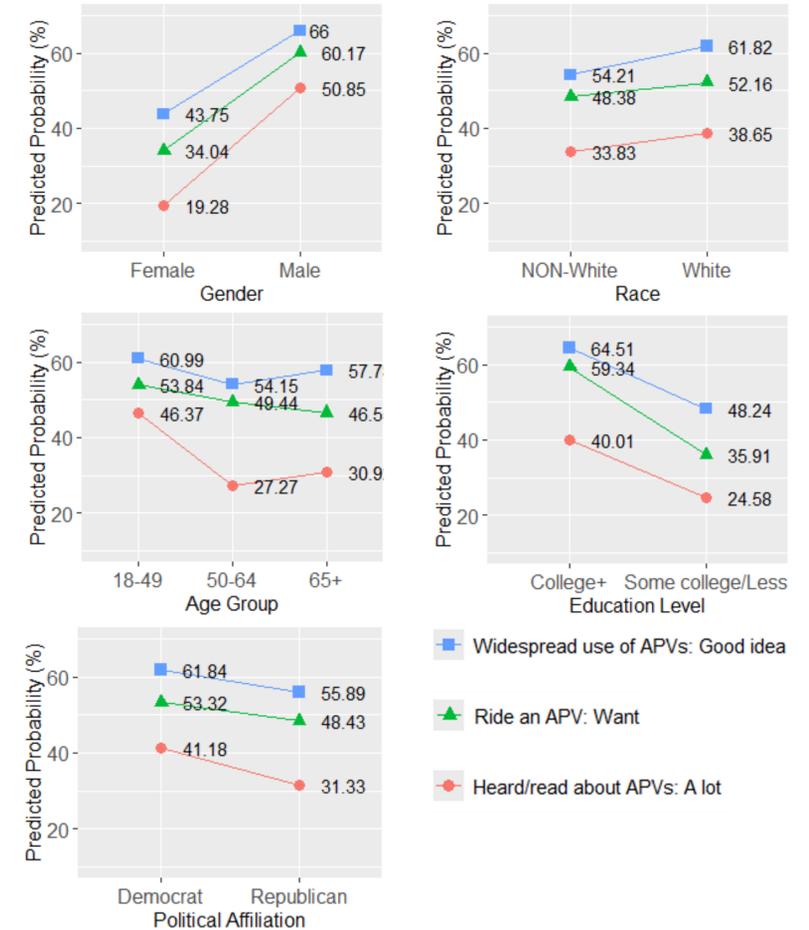
- Positive strong correlation between believing the widespread adoption of APVs is beneficial and willingness to ride in an APV.
- Negative correlations were found between opposing APV technology use for large trucks and thinking that APV widespread is a good idea.



Predicting the probability of favoring the use of APV technology for large trucks based on public opinions

- Women are less likely to favor using APV technology for large trucks than men (sensitivity score: -18.85%).
- The probability of favoring APV technology for large trucks is lower among people aged 50-64 and 65+ than among younger people (sensitivity scores: 12.12% and 12.25%).
- The sensitivity analysis indicates a 13.94% increase in the probability of favoring APV technology for large trucks among individuals with a higher education level (college+) compared to those with a lower level.

Results



Probabilities of support for ATs by socio-demographic and APV-related variable (combined inferences)

The perception of widespread use as a good idea exerts a stronger influence than the willingness to ride an APV, which, in turn, has a greater impact than knowledge about APVs on supporting autonomous trucks.

Conclusions

- This study found that men, Whites, younger individuals (18-49 years old), those with a college degree or higher, and Democrats showed higher support for autonomous trucks compared to their respective counterparts, who tend to have a more cautious stance.
- This study also highlighted the mediating role of factors such as familiarity with APV technology, willingness to ride in an APV, and perception of the widespread use of APVs in influencing public support for the use of APV technology for large trucks.

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