How do drivers respond to vehicle cyberattacks? A driving simulator study

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Motivation

Vehicle Vulnerability

- Electronic components make vehicles vulnerable to cyberattacks (Larson & Nilsson, 2008)
- Driver behavior during vehicle cyberattacks hasn't been fully studied

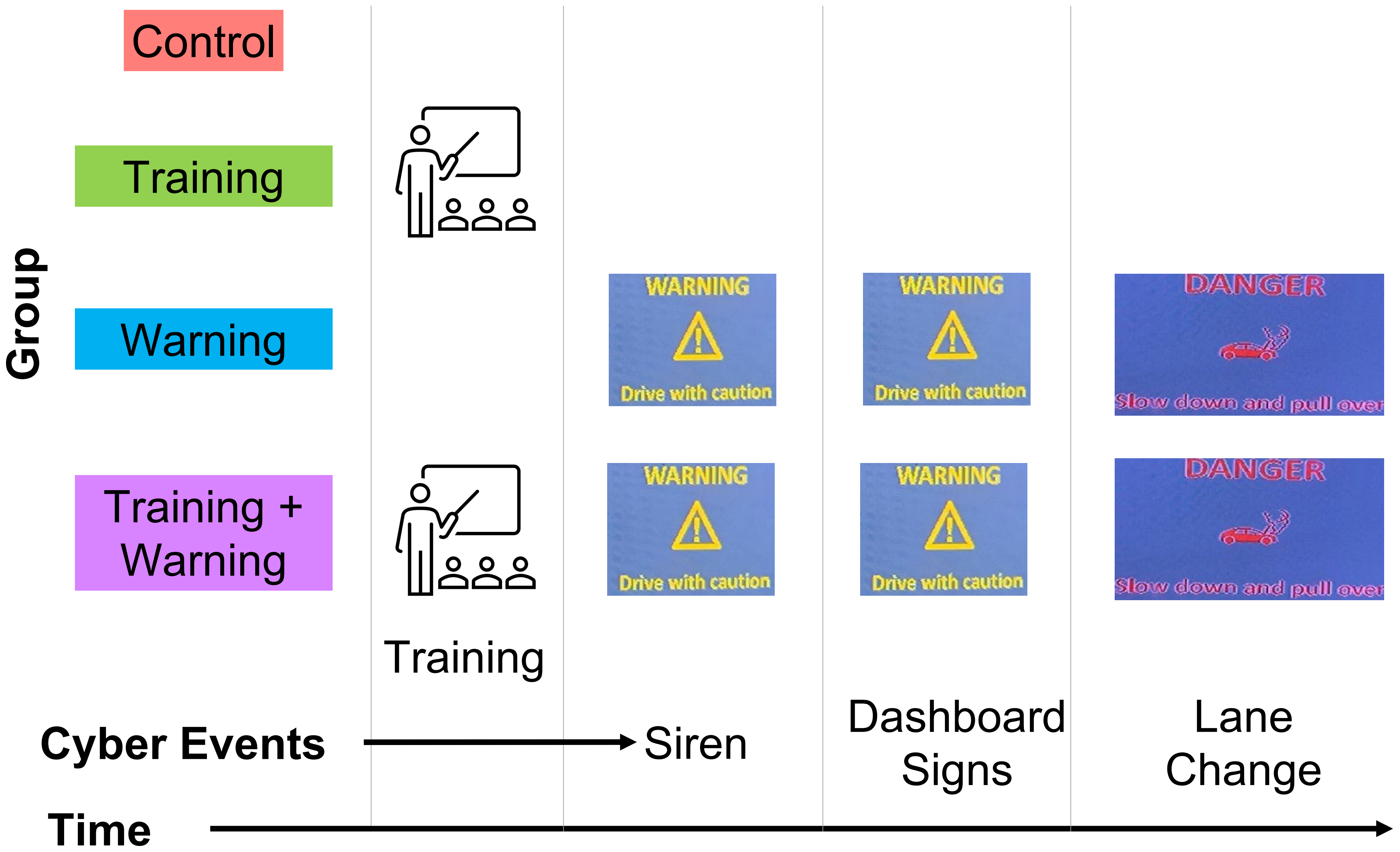
Theoretical Foundations

- Glances toward mirrors, pulling over, and using in vehicle information are indicators that the situation is properly and safely handled (Classen et al., 2010)
- Objective: Investigate how drivers respond to vehicle cyberattacks through a driving simulator study and how training and warning systems affect drivers' response behavior

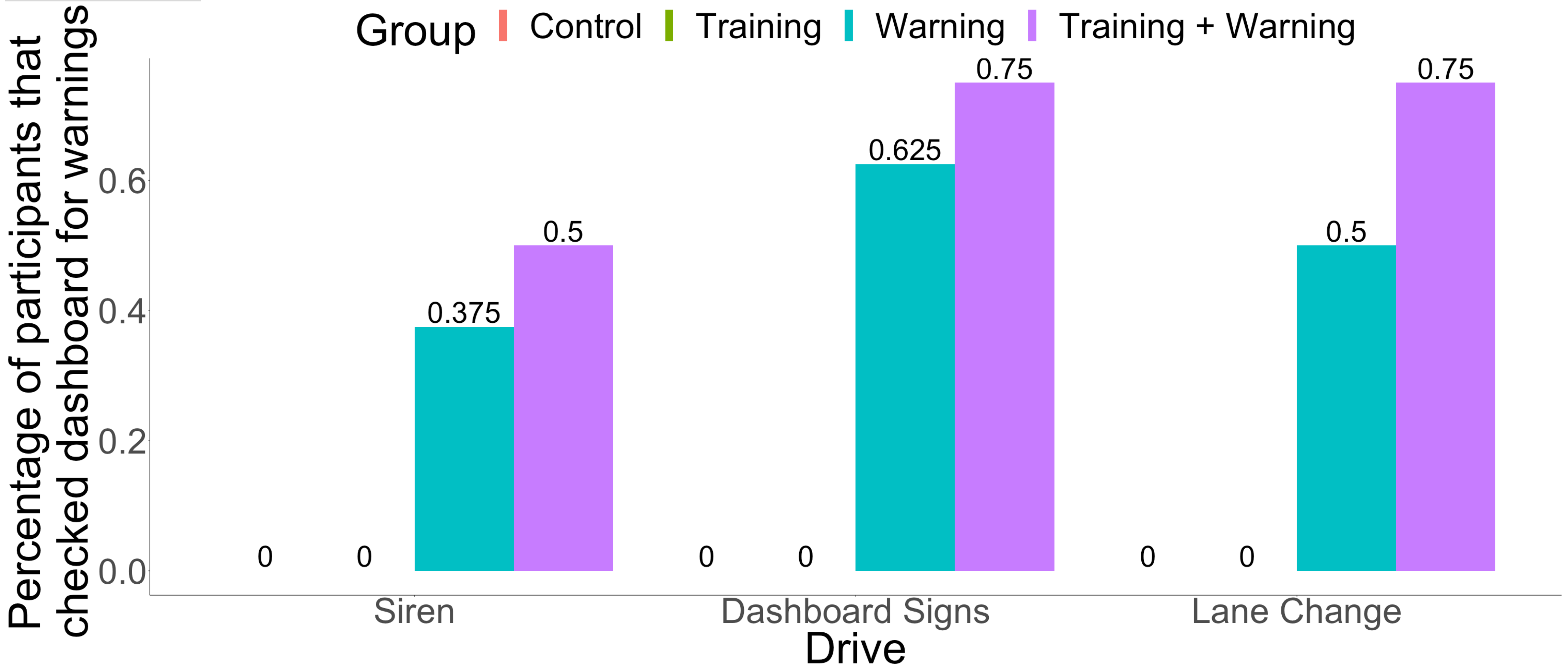
Training and Warning Systems

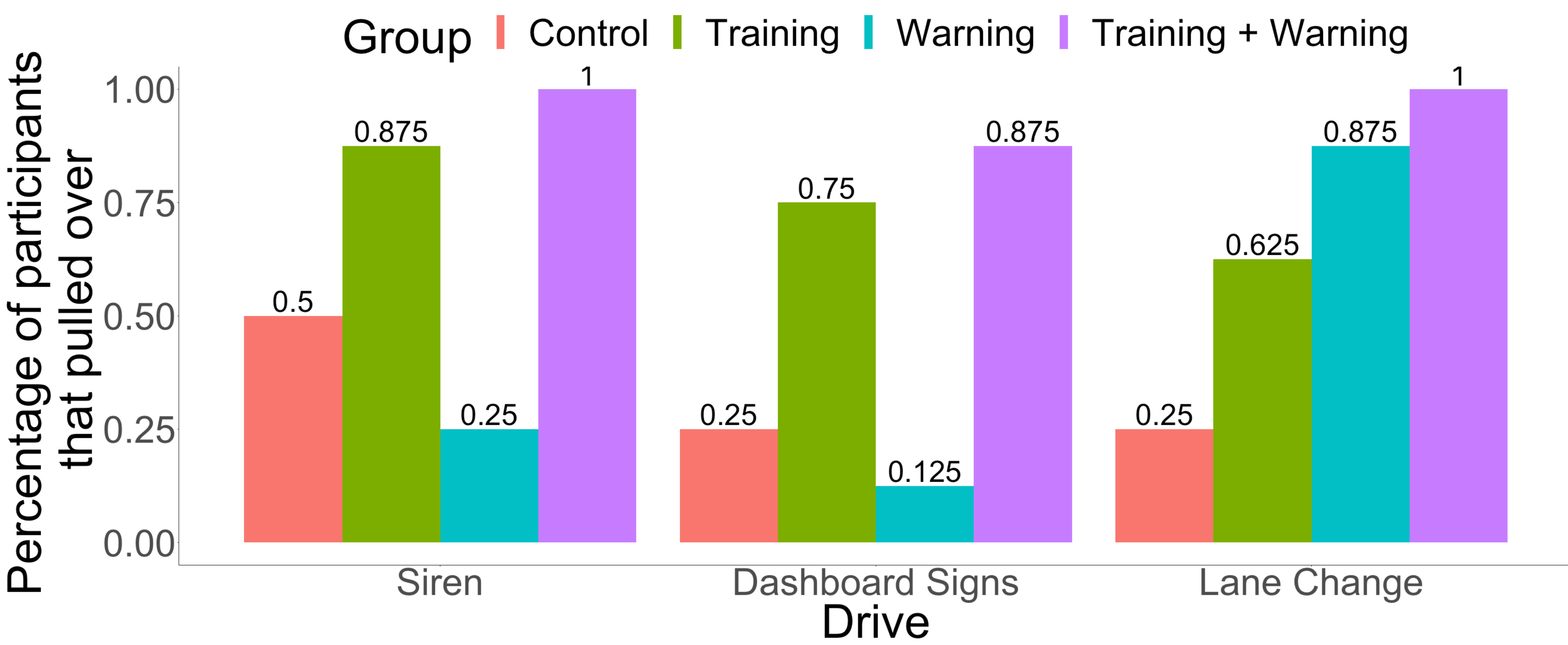
- Training and warnings are effective in helping drivers deal with unexpected, hazardous situations (Zhang et al., 2019)
- We **hypothesized that if drivers are trained on vehicle cybersecurity and receive warnings, they will respond appropriately.**

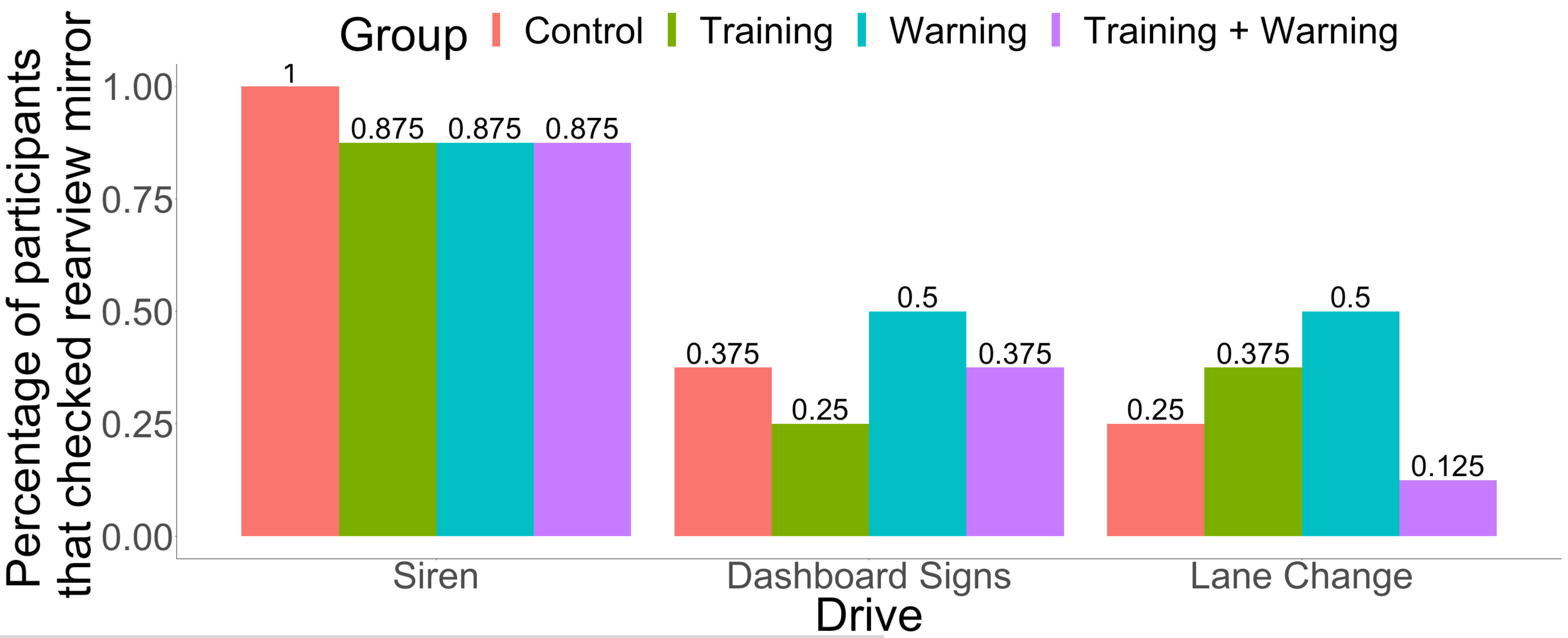
Experimental Design

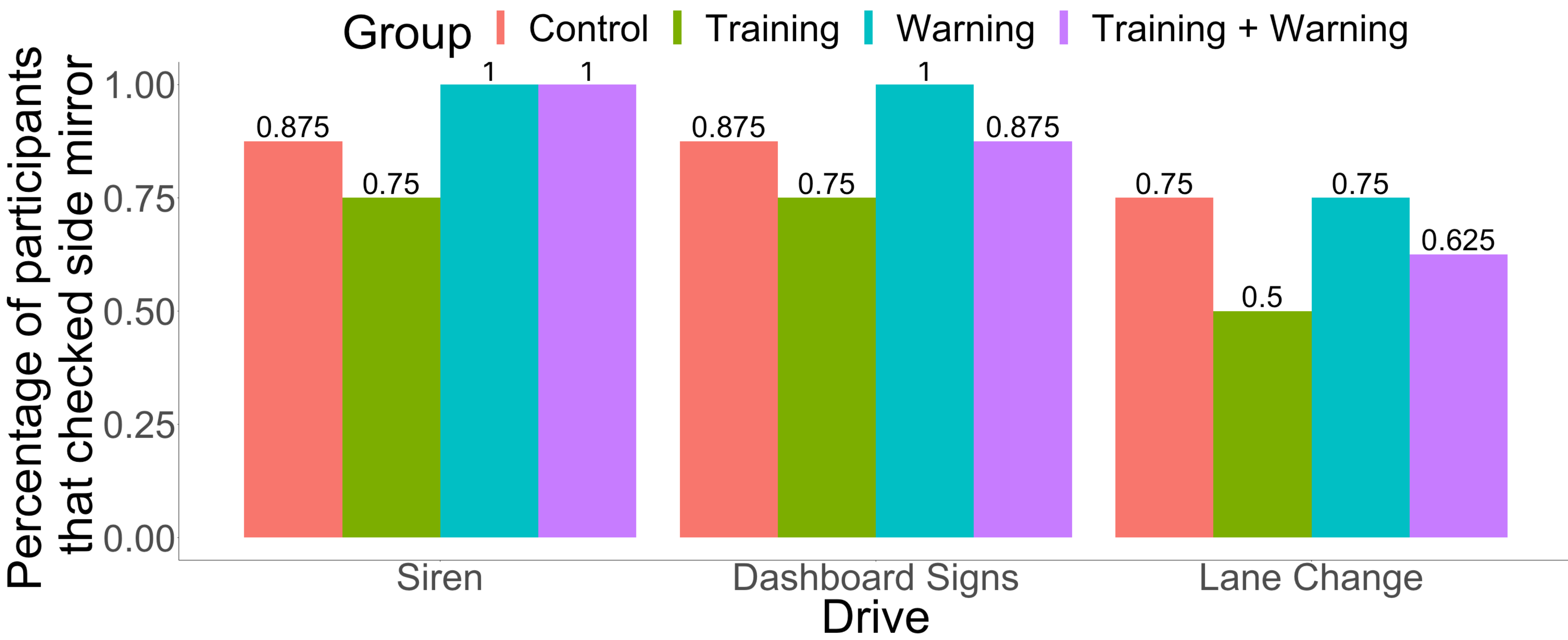


Results: Poisson regression and logistic regression models









Conclusions and Recommendations

- Differences between the groups were only exhibited among four behaviors: looking at the dashboard for warning messages, checking the rearview mirror, checking the side view mirror, and pulling over.
- A short training session leads drivers to be more cautious when their vehicle behaves unexpectedly.
- Providing simple dashboard messages captures attention but doesn't necessarily lead to a change in behavior.
- Lack of an effect for warnings indicates they can be improved
- Future work should target a different driving demographic, e.g., with more driving experience

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