Network analysis of traffic behaviors

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Abstract

Self-report-based research on traffic behavior is most often carried out with the instrumental goal of predicting traffic accidents in mind, rather than out of inherent interest in how people behave, think or feel in traffic. Therefore, nomological relationships of traffic behaviors and accidents are of central importance to the researcher. The most commonly used analysis method of self-report data is factor analysis, followed by the calculation of unit-weighted average scores of the frequencies of the behaviors that load on the factors. However, recent research (Mattsson 2012, Mattsson et al., 2015) has shown that the factor models of the commonly-used Driver Behavior Questionnaire lack the property of measurement equivalence across subgroups of respondents. This has the unfortunate consequence of rendering the meanings of the average scores group-specific. On the other hand, this may not as big a problem as it first seems, as the average scores are not relevant for the nomological relationships, which are quantified using some measure of association (such as a correlation coefficient or another). In this contribution I pursue the idea of modelling drivers' self-reported behaviors, thoughts and self-perceptions as an interrelated nomological network rather than as reflections of in principle unobservable latent variables, and suggest that the previously noted lack of measurement equivalence reflects the fact that postulating latent variables as an additional level of abstraction is unnecessary in self-report-based traffic research. Further, I examine the pairwise associations between nodes of the nomological network and being involved in a traffic accident.

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Methods

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.

Participants

Material

Procedure

Data analysis

We used R (3.4.2, R Core Team, 2017) and the R-package *papaja* (0.1.0.9492, Aust & Barth, 2017) for all our analyses.

Results

Discussion

References

Aust, F., & Barth, M. (2017). *papaja: Create APA manuscripts with R Markdown*. Retrieved from https://github.com/crsh/papaja

R Core Team. (2017). *R: A language and environment for statistical computing*. Vienna, Austria: R Foundation for Statistical Computing. Retrieved from https://www.R-project.org/