

Modeling Decision Strategy When Selecting a Driver After Drinking Lane Burdette, Olivia Warner, Rachel Wesley, Clintin Davis-Stober, Denis McCarthy

Introduction

BACKGROUND

- Alcohol-related car crashes cause over 10,000 fatalities each year (Voas & Fell, 2013)
- Little research has examined the decision to ride with someone who has been drinking (see Hultgren et al., 2018)
- The use of a designated driver is common, but people frequently "switch" designated drivers and many designated drivers are still above 0.05% BAC (Barry, Chaney & Stellefson, 2013)

CURRENT STUDY

- Assessed the strategy used in choosing a driver after a hypothetical night of drinking
- Sought to evaluate the effects of car ownership, participant gender, and perceptions about the riskiness of alcohol-impaired driving (DD) or riding with an impaired driver (RWDD) on this decision process
- Sought to test whether decision strategies used in making this choice were associated with self-reported incidents of DD or RWDD

DECISION STRATEGY CLASSIFICATIONS (DD/RWDD DECISION-MAKING TASK)

"Friend Car" Condition: There was strong evidence (median Bayes Factor = 3.43 E+21) pairing all subjects (N=9) to Difference models, as described in the table to the right.

"My Car" Condition: There was little evidence (median Bayes Factor = 0.393) pairing any subject (N=11) with any Difference model or the Car Ownership model. Most data indicated little preference for car driver, potentially indicating indifference, experimenter error, or the use of an untested model.

Because the difference models were so well-supported in the "Friend Car" condition, the Safe Ride models were not tested.

PARTICIPANTS

Recruited from a large university and the surrounding community. All reported typical alcohol consumption as at least twice weekly.

N = 20, Mean age = 24.2, 65% female

MEASURES

Alcohol use. Self-reported number of past-month binge drinking episodes.

DD/RWDD risk sensitivity. Ranked perceived danger (0 = not dangerous, 100 = most dangerous) of driving after consuming 1, 3, and 5 drinks within two hours; or of riding with a driver who consumed 1, 3, and 5 drinks within 2 hours.

DD/RWDD behavior. Self-reported past-year incidents of driving after consuming 1, 3, and 5 drinks within two hours; riding with a driver who consumed 1, 3, and 5 drinks within 2 hours.

DD/RWDD decision-making task. Participants indicated whether they or a friend should drive the pair home after a hypothetical night of drinking, given the number of drinks (0-8) consumed by each person. There were two between-groups conditions such that the car available to drive either belonged to the participant ("My Car") or to their friend ("Friend Car").

Results

Condition	Model	Description	Ν
Friend Car	Δ00	Sensitive to all differences in drink number. If tied, non-car owner (participant) drives	2
Friend Car	Δ0	Sensitive to all differences in drink number. If tied, car owner (friend) drives.	5
Friend Car	Δ1	Insensitive to differences in drink number \leq 1	1
Friend Car	Δ3	Insensitive to differences in drink number ≤ 3	1

FURTHER ANALYSIS

This project was limited by a small sample size as data collection stopped in late March to compensate for the COVID-19 outbreak. Further analysis would make inferences connecting decision strategy to self-reported drinking behavior.

Method

60% Reported past-year DD

65% Reported past-year RWDD Non-zero mean frequency of past-year RWDD incidents = 8.35

three potential model sets:

1) Car ownership model. The between-conditions car owner would always be selected as driver.

2) Difference models. Decisions would be made based on the difference in individual drink consumption, with lower consumer selected. Also assessed heterogeneity in drink differences (ranging from 0-7 drinks).

3) Safe ride models. Posited that the between-conditions car owners would be selected as driver until they surpassed a "safe" level of intoxication, at which point the alternate driver would be selected, given that they were below this "safe" limit (defined at 2, 3, or 4 drinks)

- experimenter.



Non-zero mean frequency of past-year DD incidents = 6.42

DATA ANALYSIS

Participant data from the DD/RWDD decision-making task was compared against a set of models via Bayesian analysis in order to determine participant decision-making strategy. There were

Conclusions

• The decision to select a driver after drinking can be classified by decision strategies comparing the number of drinks consumed by each individual.

 We observed heterogeneity within identified Difference models, indicating varying sensitivity to drink differences and that these differences can be distinguished by an

• Decision strategies may differ when people are choosing a driver for their own car as compared to choosing a driver for a car belonging to another individual