



Resources and Tools to Reduce Multiple Risky Driving Behaviors

Agenda

- Project Overview and Goals
- Review of Literature
- A Brief Intervention to Reduce Multiple Risky Driving Behaviors
- Findings from a Randomized Controlled Trial
- Recommendations and Guidance

Project Overview and Goals

There is growing recognition that drivers involved in fatal crashes are often engaged in multiple risky driving behaviors – not wearing a seat belt, speeding, distracted driving, and driving impaired.

FARS. (2020). Fatality Analysis Reporting System (FARS) | NHTSA. <https://www.nhtsa.gov/research-data/fatality-analysis-reporting-system-fars>

Those engaged in multiple risky driving behaviors may require more intensive or different interventions than are typically provided to drivers who are cited for any one of these risky behaviors in isolation.

Research evidence suggests there are associations between multiple risky driving behaviors.

- Li, K., Simons-Morton, B. G., & Hingson, R. (2013). Impaired-driving prevalence among US high school students: Associations with substance use and risky driving behaviors. *American Journal of Public Health, 103*(11), e71-7.
- Simons-Morton, B., Li, K., Ehsani, J., & Vaca, F. E. (2016). Covariability in three dimensions of teenage driving risk behavior: Impaired driving, risky and unsafe driving behavior, and secondary task engagement. *Traffic Injury Prevention, 17*(5), 441–446. <https://doi.org/10.1080/15389588.2015.1107183>

Our Project Goals

- Understand factors associated with multiple risky driving behaviors
- Develop and test a brief intervention to reduce multiple risky driving behaviors
- Create guidance and recommendations

A Review of Literature



Factors
Associated
with Multiple
Risky Driving
Behaviors

- Impulsivity
- Cognitive Factors
- Affective Factors
- Motivational Factors
- Contextual Factors

Impulsivity

- Traffic impulsivity is defined as “the tendency to act quickly and inaccurately or act quickly and accurately without considering and elaborating on the future consequences while driving.”

Specifically, it may involve the inability to wait in traffic; expressing anger and aggression to others while driving; speeding; using a phone while driving; close following; and making sudden accurate or inaccurate maneuvers without considering consequences. (Bıçaksız & Özkan, 2016, p. 220)

Impulsivity

- Impulsivity is associated with high-risk driving behaviors (e.g., speeding, following too closely, driving while impaired) and negative outcomes associated with high-risk driving (e.g., driver anger/aggression, driving under the influence of alcohol, traffic crashes, and traffic violations) (Beanland et al., 2014; Bıçaksız & Özkan, 2016; Eensoo et al., 2010; González-Iglesias et al., 2012; Hatfield et al., 2017; Paaver et al., 2006).
- Impulsivity is amenable to change and a trait that overlaps and is associated with other factors that affect risky driving (Al-Tit, 2020).

Al-Tit, A. A. (2020). The impact of drivers' personality traits on their risky driving behaviors. *Journal of Human Behavior in the Social Environment*, 30(4), 498–509. <https://doi.org/10.1080/10911359.2019.1700866>

Beanland, V., Sellbom, M., & Johnson, A. K. (2014). Personality domains and traits that predict self-reported aberrant driving behaviours in a southeastern US university sample. *Accident Analysis & Prevention*, 72, 184–192. <https://doi.org/10.1016/j.aap.2014.06.023>

Bıçaksız, P., & Özkan, T. (2016). Impulsivity and driver behaviors, offences and accident involvement: A systematic review. *Transportation Research Part F: Traffic Psychology and Behaviour*, 38, 194–223. <https://doi.org/10.1016/j.trf.2015.06.001>

Eensoo, D., Paaver, M., & Harro, J. (2010). Factors associated with speeding penalties in novice drivers. *Annals of Advances in Automotive Medicine / Annual Scientific Conference*, 54, 287–294.

Hatfield, J., Williamson, A., Kehoe, E. J., & Prabhakaran, P. (2017). An examination of the relationship between measures of impulsivity and risky simulated driving amongst young drivers. *Accident Analysis & Prevention*, 103, 37–43. <https://doi.org/10.1016/j.aap.2017.03.019>

Paaver, M., Eensoo, D., Pulver, A., & Harro, J. (2006). Adaptive and maladaptive impulsivity, platelet monoamine oxidase (MAO) activity and risk-admitting in different types of risky drivers. *Psychopharmacology*, 186(1), 32–40. <https://doi.org/10.1007/s00213-006-0325-3>

Other Factors Associated with Multiple Risky Driving Behaviors

Cognitive Factors

- Sensation seeking
- Risk perceptions

Affective Factors

- Driving anger and aggression
- The Big 5 personality factors (i.e., extraversion, agreeableness, neuroticism, conscientiousness, and openness).

Motivational Factors

- Reward sensitivity
- Tolerance of deviance



Contextual Factors

- Demographic variables
- Substance use behaviors
- Psychological reactance

Factors	Speeding	Impaired Driving	Seat Belt Use	Distracted Driving	Other
Impulsivity	X	X	X	X	X Aggressive Driving
Sensation Seeking	X	X		X	X Unsafe Passing, Ignorance of Traffic Rules
Risk Perceptions	X	X	X	X	X Tailgating, Driving fast just for the thrill of it
Attitudes & Beliefs	X	X	X	X	
Driving Anger	X				X Rule violations
Aggression	X				X Weaving through traffic, Using Shoulder to Pass, Rule Violations
Big 5	X		X	X	X Aggressive Driving
Reward Sensitivity	X	X			
Tolerance of Deviance	X	X	X		X Aggressive Driving
Demographics	X			X	X Aggressive Driving
Substance Use	X	X			X Aggressive Driving
Psychological Reactance		X	X		

For more information about factors associated with specific risky driving behaviors in the Multiple Risky Driving Behaviors Final Report at

<https://www.mdt.mt.gov/research/projects/trafficsafety-rrb.aspx>



Strategies to Reduce Risky Behaviors and Factors

- Speeding
- Impaired Driving
- Seat Belt Use
- Distracted Driving
- Impulsivity
- Risk Perceptions
- Modifying Mediating Factors

**A Brief Intervention
to Reduce Multiple
Risky Driving
Behaviors**

Brief Intervention Design

The brief intervention sought to

- meet the person where they were in the process of behavior change,
- provide education about high-risk driving behaviors,
- explore cognitions related to multiple risky driving behaviors,
- provide behavioral strategies to increase safe driving behaviors, and
- use strategies that seek to grow a person's motivation.

The brief intervention was designed using a strong theoretical foundation

- An Integrated Behavior Model,
- Motivational Interviewing,
- Transtheoretical Model of Behavioral Change,
- Harm Reduction,
- Cognitive-Behavioral Approach, and a
- Strengths-Based Perspective.

The content for the brief intervention was designed to be delivered virtually in approximately 5-7 minutes, followed by text messages to support behavior change.

The Computerized Intervention Authoring System, version 3 (CIAS) was used as the platform for delivering the brief intervention (Ondersma et al., n.d.).

5 Brief Sessions

- Emotion Session
- Seat Belt Session
- Distracted Driving Session
- Driving Under the Influence Session
- Speeding Session

Brief Intervention Content

The Emotion Session focused on identifying and regulating emotion, a strategy which seeks to reduce impulsivity. The skill of identifying and regulating emotion was carried into the specific behavior sessions

The risky behavior sessions followed a similar format designed to

- provide education and heighten risk awareness,
- provide personalized feedback based on the assessment of multiple risky driving beliefs and behaviors,
- provide normative data about the specific risky driving behaviors,
- practice identifying and regulating feelings, and
- provide risk-mitigating strategies to reduce multiple risky driving behaviors and improve safety.

Text messages were designed to build motivation and commitment for change, bolster protective beliefs, and encourage participants to practice identifying and regulating emotion.

Pilot Testing

- Assessment Pilot Testing
 - Used Qualtrics-purchased panel of young adults (18-25) in the U.S.
 - Determine internal and test-retest reliability of the measures with the focus population
 - Pilot test findings supported the use of the assessment for the randomized controlled trial to test the effect of the brief intervention
- Brief Intervention Pilot Testing
 - Logic model was created for the proposed intervention
 - Intervention components were pilot tested and refined
 - 8 interviews with participants (aged 18-25) were conducted

Findings from a Randomized Controlled Trial

Randomized Controlled Trial

- Two cohorts – recruited through direct email advertising
- Eligibility criteria:
 - Ages 18-25
 - Hold a valid driver's license
 - Report driving at least once a week
 - Report engaging in at least two risky driving behaviors in the past month
- Power analysis suggested a total final sample of 172 participants was necessary for 80% power to detect a small-to-moderate effect (partial $\eta^2 = .03$) with $\alpha \leq .05$ and a .5 correlation between measurements
- Cohort 1 launched April 2023/ Cohort 2 launched October 2023
- Eligible participants were randomly assigned to one condition – control (n= 126) or intervention (n=232).

Randomized Controlled Trial Timeline

	Week 0	1	1	2	3	4	5	6	7	8-19	20
Intervention	Recruitment and screening	Session 1 (Consent, randomize, baseline)	Session 2 (Emo. Reg.)	Session 2 practice (and texts)	Session 3 (1 st ranked behavior)	Session 3 practice (and texts)	Session 4 (2 nd ranked behavior)	Session 4 practice (and texts)	Session 5 (Post assessments)	* 3 months post	Follow-up assessments
Control	Recruitment and Screening	Session 1 (Consent, randomize, baseline)	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	No Treatment	Post assessments	* 3 months post	Follow-up assessment

- Participants were incentivized throughout the study with Amazon gift cards.

Randomized Controlled Trial Sample

- A total of 43 participants completed the baseline survey and at least one of the subsequent surveys (post-test or three-month follow-up)
- 17 participants were randomized to control and 26 to intervention
- Intervention participants were assigned to address two risky driving behaviors: speeding, distracted driving, not wearing a seat belt, and driving under the influence (whichever two behaviors endorsed in that order were the sessions assigned to the participant).

Results

- Overall, no significant difference was found between intervention and control participants in risky driving behavior or other study variables (e.g., impulsivity, emotional intelligence, beliefs), likely due to a small sample size and inadequate power.
- Qualitative data suggests that participants learned relevant information and applied the information to their driving.

Results

Participant Feedback

Statement	M (SD)	% Disagree or Strongly Disagree	% Agree or Strongly Agree
I learned relevant information about driving.	3.60 (1.04)	8.0	60.0
I think about the information from the sessions when I'm driving.	3.48 (1.12)	20.0	72.0
I have been able to apply the information from the sessions.	3.56 (1.04)	12.0	64.0
I am motivated to improve my driving.	3.68 (1.31)	24.0	68.0
I have changed my driving as a result of participating in this study.	3.28 (1.21)	20.0	44.0

Results

“ I am using my cell phone less, and not following other vehicles as closely. ”

“ I am working on being more present and mindful when I am driving, ”
because driving distracted can be dangerous to myself and others.

“ I believe my driving has become safer and I am more conscious when I drive. It's amazing what just a little reflection can do to your actions. I'm not perfect now by any means but I do not use my phone at all anymore while driving and I do consider the speed limits and their safety and illegal implications and therefore drive a little slower. I used my seat belt more often too. For an example we were driving back from a neighbor's a mile from our house and I used my seatbelt even when a passenger told me I don't need to, when earlier I might have not wore it. ”

“ I am practicing being more aware when I am driving and more in the moment. ”

“ I do not speed so often anymore and I am more aware of my driving.
Also think about consequences of bad driving and that helps me not to.”

“ I have been able to focus more on my surroundings and be less stressed while driving. ”

“ I try not to let emotions control my driving. ”

Results

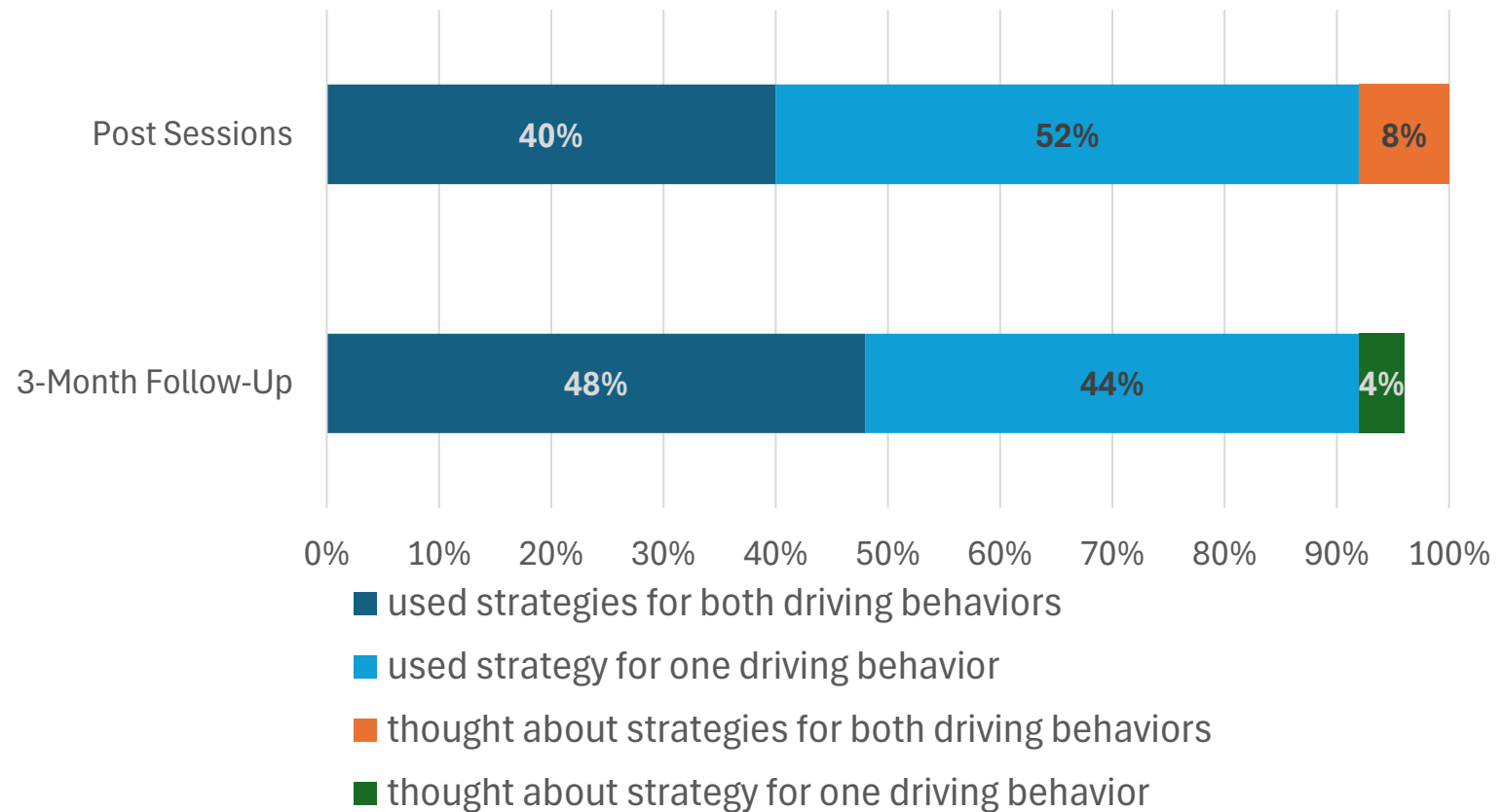
- Participants in the brief intervention to reduce multiple risky driving behaviors utilized both primary and secondary strategies to address their risky driving behaviors.

Types of Strategies Selected by Risky Driving Behavior

	n	Primary	Secondary
Speeding	23	56.5%	43.5%
Distracted	24	58.3%	41.7%
Seat belt	1	--	100%
Driving under the influence	4	50.0%	50.0%

Results

- Participants in the intervention continued to utilize the strategies they had selected three months later.



Participants who received the intervention reported utilizing the strategies after session delivery and three months later

Conclusion

- Limitations
 - Recruitment and attrition challenges
 - Small sample size
 - Findings may not generalize
- Take-aways
 - Participants were able to utilize strategies
 - Also reported improvements in attention and emotion regulation

Recommendations and Guidance

Recommendations and Guidance

Based on the research findings, traffic safety professionals can address multiple risky driving behaviors.

- Consider providing primary strategies and secondary strategies that mitigate risk and reduce harm when engaging young adults. Those engaging in multiple risky driving behaviors may benefit from recommendations and strategies that allow more choices, including harm reduction strategies.
 - Primary strategies are intended to directly reduce engagement in risky driving behaviors. For example, a primary strategy for distracted driving is “I will put my phone away and out of reach before I start driving.”
 - Secondary strategies are those intended to reduce harm and mitigate the risk of the driving behavior by limiting the potential negative consequences. For example, a secondary strategy for distracted driving is “I will choose to not use my cell phone when I am driving at high speeds.”

Recommendations and Guidance

- Support emotion regulation among youth and young adults in your communities and states and consider leveraging existing infrastructures to integrate emotion regulation skill-building. Emotion regulation is defined as changing one's response to emotions to better their well-being. Emotion regulation was identified as a potentially effective way to reduce impulsivity, a factor associated with multiple risky driving behaviors.

Additional recommendations can be found in the Multiple Risky Driving Behaviors Final Report

(DOI: <https://doi.org/10.21949/1529562>)

A Resource to Reduce Multiple Risky Driving Behaviors Among Young Adults

A RESOURCE TO REDUCE MULTIPLE RISKY DRIVING BEHAVIORS AMONG YOUNG ADULTS

There is growing recognition that drivers involved in fatal crashes are often engaged in multiple risky behaviors – driving distracted, not wearing a seat belt, speeding, and driving impaired.¹ This resource is intended to help traffic safety stakeholders engage young adults in growing skills and utilizing practical strategies to reduce engagement in multiple risky driving behaviors.



This resource helps young adults

- learn to identify and regulate their feelings,
- explore cognitions related to multiple risky driving behaviors (speeding, distracted driving, not wearing a seatbelt, and driving under the influence of substances),
- and learn and use behavioral strategies to increase safe driving behaviors.

Most young adults care about creating positive change for themselves, their community, and their state. One positive change that young adults can make that impacts everyone is to reduce risky driving behaviors. This resource will help them make that positive change.

EXAMPLES OF WAYS TO REACH YOUNG ADULTS TO DISTRIBUTE THIS RESOURCE

- Incorporate into a driving education course.
- Use as educational materials in outreach efforts.
- Distribute to state universities and/or private colleges throughout your state to be shared with students through administrators, wellness offices, and/or professors.
- Partner with local prevention agencies to distribute at events (e.g., health fairs) or as part of awareness activities (e.g., Distracted Driving Awareness Month, National Impaired Driving Prevention Month, etc.).
- Partner with workplaces to distribute this resource to employees.
- Consider adding this resource to your website to make it easily accessible.

Resources and Tools to Address Multiple Risky Driving Behaviors

Montana Department of Transportation
in cooperation with the U.S. Department of Transportation
Federal Highway Administration



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