Real-Life Strategies and Associated Perceived Barriers to Curb Distracted Driving: Psychometric Examination and Validation

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NSF Award Number: 1949760

Introduction

- Young drivers are highest risk for motor vehicle crashes involving distracted driving behavior (Delgado et al., 2016)
- Previous research has been conducted examining the various predictors of increased crash risk among young drivers (K. Braitman & A. Braitman, 2017; Farmer et al., 2015; Hassani et al., 2016; Oviedo-Trespalacios et al., 2019)
- Intervening among this age group is essential (Hassani et al., 2016)
- Perceived seriousness and susceptibility seem to be associated with actual participation in curbing strategies (Becker, 1974)
- Although there exist various interventions designed to motivate young drivers to stop using their cell phone while driving, little research has been conducted examining the actual strategies used to curb distracted driving behavior

Method

Participants and Procedure

- *N* = 1345 participants recruited via Sona and student announcements at Old Dominion University
- Participants must be able to understand English, must drive, and must be 18-30 years old
- Data were collected between 7/6/2021 and 4/22/2022
- Participants completed an online survey

Materials

- Participants completed four questions involving their perceptions of crash risk and were asked about their driving history

Young Adult Attachment to Phone Scale (YAPS; Trub & Barbot, 2016)

- 6 items, 5-point response scale
  - Refuge factor (3 items; e.g., "I feel anxious or uncomfortable when I can't check my phone")
  - Burden factor (3 items; e.g., "I intentionally put my phone out of reach to enjoy an activity I'm engaged in")

Distracted Driving Questionnaire (Braitman & Braitman, 2017)

- 21 items assessing frequency of distracted driving behaviors
  - 4-point response scale
- Same 21 items repeated to assess perceived distraction level
  - 3-point response scale

Protective Behaviors to Curb Distracted Driving

- 25 items created by the researchers based on focus groups
- 4-point response scale

Analysis Approach

1. Exploratory Factor Analysis (EFA) to explore dimensionality:
   - Scree plot, MAP analysis, eigenvalues suggested 2 or 3 factors
2. Confirmatory Factor Analysis (CFA) to confirm factor structure
   - Initial 3-factor model had poor fit. Dropping items with lower loadings resulted in elimination of third factor
   - Initial 2-factor model had poor fit. Dropping items with lower loadings resulted in two factors with 5 items each (**final model**)
3. Measurement Invariance testing across sex and race
4. Validation analyses (correlations and regression)

Results

Final Model after Trimming Items from 2-Factor CFA:

Factor 1:

14. Type in address to GPS before you start driving
15. Use phone hands-free for talking (for example, using Bluetooth or speakerphone)
16. Using phone hands-free for other functions (for example, placing calls, taking calls, dictation for texts)
24. Prepare food for eating easily before you start driving (for example, using a water bottle with a straw, unwrapping your food)

**25. Have a passenger help with non-driving tasks (for example navigate, send texts for you, unwrap food)*

Factor 2:

5. Use technology that detects fast motion and prevents notifications and notifies those sending messages that you are driving (for example, the "do not disturb" driving function on iPhones and similar apps)

6. Use technology that prevents notifications and notifies those sending messages that you are driving, but does not automatically engage based on motion
7. Use apps to block notifications when driving (but that do not notify those sending messages that you are driving)
8. Use apps to limit other phone functionality when driving (for example, navigation that requires verifying you are a passenger)

9. Silence notifications

Note. Italic/grey items are non-invariant across race.

Invariance Testing

Gender:

- Strong invariance among factor loadings and intercepts revealing that men and women interpret and endorse items similarly

Race:

- Non-invariance among factor loadings revealing a difference between Black and White students' interpretations of the items highlighted

Table 1. Pearson correlations between our factors and DDQ, YAPS, driving history, risk perception, and age.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. CDD Factor 1	-	**.25***	**.07***	.05	**.09***	**.11***	**.18***	**.12***	**.22***	.00	**.06***	-.01	.02
2. CDD Factor 2		-	.05	**-.11***	**.18***	.03	**.10***	.00	-.01	**-.07***	**-.11***	**-.09***	**-.20***
3. Distracted Driving			-	.25*	.02	.01	-.01	-.04	-.02	.42	.21*	.13*	-.02
4. YAPS Refuge				-	-.29*	.14*	.09*	.06*	0.7*	.02	.07*	.04	.06*
5. YAPS Burden					-	-.02	.04	-.01	-.01	.02	.01	.00	.04
6. Driving perceived crash risk						-	.58*	.29*	.21*	.02	-.01	-.01	-.01
7. Distracted Driving perceived crash risk							-	.35*	.29*	-.02	.00	.03	.01
8. Perceived increased crash risk by distracted driving (self)								-	.60*	.02	.02	.03	.08*
9. Perceived increased crash risk by distracted driving (others)									-	.01	.01	-.00	.02
10. Lifetime traffic accidents										-	.14*	.08*	.25*
11. Typical number of days drive per week											-	.44*	.18*
12. Time spent driving in a week												-	.08*
13. Age													-

Examined shape of relationship between curbing behaviors and distracted driving via regressions

- Outcome = distracted driving; predictors = linear and quadratic factors
- Factor 1: Both the linear and quadratic associations were non-significant.
- Factor 2: The quadratic relationship was a significant predictor

Table 2 (Regression Analysis).

Variable	*t*	*p*	β	*F*	*df*	*p*	adj. R^2
Overall Model				5.99	2	.003	.008
(Constant)	124.44	.000					
Curbing behaviors (linear)	1.58	.113	.046				
Curbing behaviors (quadratic)	**-2.51**	**.012**	**-.072***				

Discussion

- Two dimensions of distracted driving
- Strong invariance across gender (men vs. women)
- Non-invariant loadings (potentially different interpretations) across race (Black vs. White) for some items, so it is important to keep race in mind when administering this scale
- Our study will allow future researchers to investigate self-efficacy and perceived barriers for curbing distracted driving
- This information is necessary for research to develop and implement better programs to prevent distracting driving, especially in this age category

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