Distracted Driving final report: A summary of two surveys on the psychological predictors of self-reported distracted driving

Prepared for Risk Institute at Fisher College of Business

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Approach. We conducted two surveys of Americans (Study 1: N=386, 49.5% male, 82.6% white; Study 2: N=648, 49.5% male, 77.7% white) who reported that they drive at least 3 times per week and own a smart phone. We asked them about distracted driving behaviors, risk perceptions of distracted driving, attitudes towards driving and their cell phones, and their attitudes towards methods of reducing distracted driving behavior.

Although a more detailed report of our findings is available on subsequent pages, key findings revealed that:

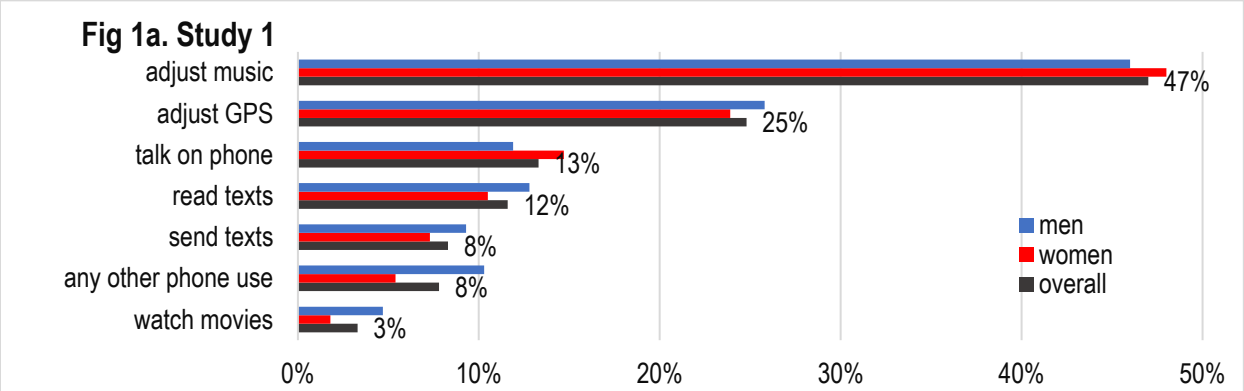
1. **Most people admit to driving distracted**: 66.4% of drivers admitted to ever using cell phones while their car was in motion (this question was only asked in Study 2). **However, most people report that their incidences of distracted driving are infrequent.** Only 9.4% of drivers reported cellphone use while driving (CPUWD) more than half of the time they drive; most distracted drivers reported only occasional CPUWD.
    a. Drivers were most likely to report CPUWD while in parking lots (35.1% of trips) and while stopped (39.4% of trips). The proportion of drivers using the phone for texting and talking was low although higher than desirable (i.e., average prevalence was below 20%)
    b. As expected, when audio was further divided into additional categories people report using phones less than in-car controls (i.e., dash or steering wheel/hands-free) for audio. Also, audio use that represents less objectively dangerous distraction (e.g., adjusting volume) was more prevalent than objectively more dangerous behaviors (e.g., scrolling through a playlist)
2. **People who drove distracted more** often and across multiple behaviors and situations **were overconfident in their distracted driving ability, had positive attitudes towards their cell phones, and overestimated how often others drove distracted**
    a. Demographic variables (i.e., being male and being younger) did not consistently predict increased distracted driving when psychological factors were taken into account
    b. Greater risk perceptions predicted less distracted driving in Study 1, but not Study 2
    c. In Study 2, **greater message reactance** (i.e., having negative responses to attempts to reduce distracted driving and believing the risks are overstated) **predicted greater distracted driving**
3. **People were generally supportive of methods to reduce driving distracted**.
    a. **In general, less restrictive methods were supported more than more restrictive methods**. People supported pledges, discounts, and methods aimed at teen drivers more than fines or apps that prevented use of phones
    b. **The framing of mitigation method matters**: in Study 2, framing mitigation positively vs. negatively (e.g., charging good drivers less vs. charging bad drivers more) and in terms of helping vs. preventing (e.g., apps that help drivers not use phones vs. apps that prevent drivers from using phones) increases support.
    c. **Greater support of methods to reduce distracted driving was predicted by greater risk perceptions towards distracted driving, more positive attitudes towards cell phones**, **and thinking other people are worse drivers than oneself** (Study 1 only). In Study 1, greater support was associated with less distracted driving. In Study 2, **reactance**, but not distracted driving self-report, predicted support: people with greater reactance were less supportive of the strategies.
4. Very few people have used any of the distraction mitigation strategies (besides Bluetooth and insurance discounts, usage rates for the strategies were all well below 25%)
5. Across the two studies, **perceptions that a distracted-driving study was more credible and convincing were higher amongst people who supported distracted driving mitigation policies and had greater risk perceptions of distracted driving**. Being younger (Study 1), more confident in ability to drive while using phone, more positive attitudes towards phones, and being male or non-white (Study 2) also predicted persuasion but not consistently. Contrary to our expectations, a nonnumeric message was more persuasive than a numeric message, which we will explore in future research.
6. A **new measure of reactance** developed for Study 2 was correlated with **lower support for mitigation strategies and lower ratings of anti-distraction messaging**. Higher reactance was predicted by **lower risk perceptions of distracted driving, greater perceived benefits of CPUWD, more time spent driving per week, more positive driving attitudes, more negative cell phone attitudes,** lower verbal intelligence, and lower subjective numeracy.

More detailed report of findings

Prevalence of distracted driving

Participants reported the percentage of trips in which they performed a variety of distracted driving behaviors (Fig 1) and the percent likelihood of using phone while driving in a variety of situations (Fig 2) in Study 1.

Figure 1. Prevalence of specific distracted driving behaviors. Participants reported the percentage of trips in which they drove and did each behavior. Behaviors are ordered from most to least reported. Study 1 is presented in Panel a; Study 2 in Panel b. In Study 2, "adjust music" was split into 6 categories: "searching phone for specific media" was added, because it takes drivers attention, hands, and eyes off of driving, and drivers were asked whether they used "dashboard" or "steering wheel/hands-free" controls to "adjust volume," and whether used "dashboard," "steering wheel/hands-free controls," or "phone" to "change stations/advancing playlist." We also distinguished between adjusting GPS using phone or dashboard controls.



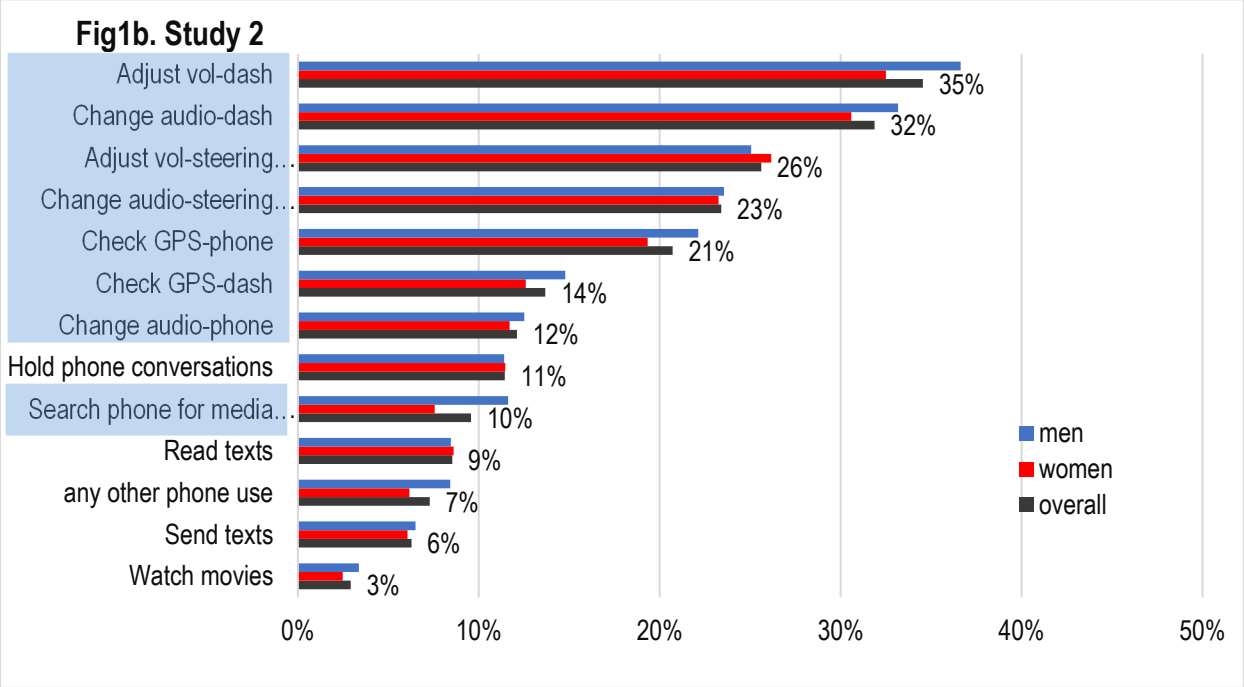
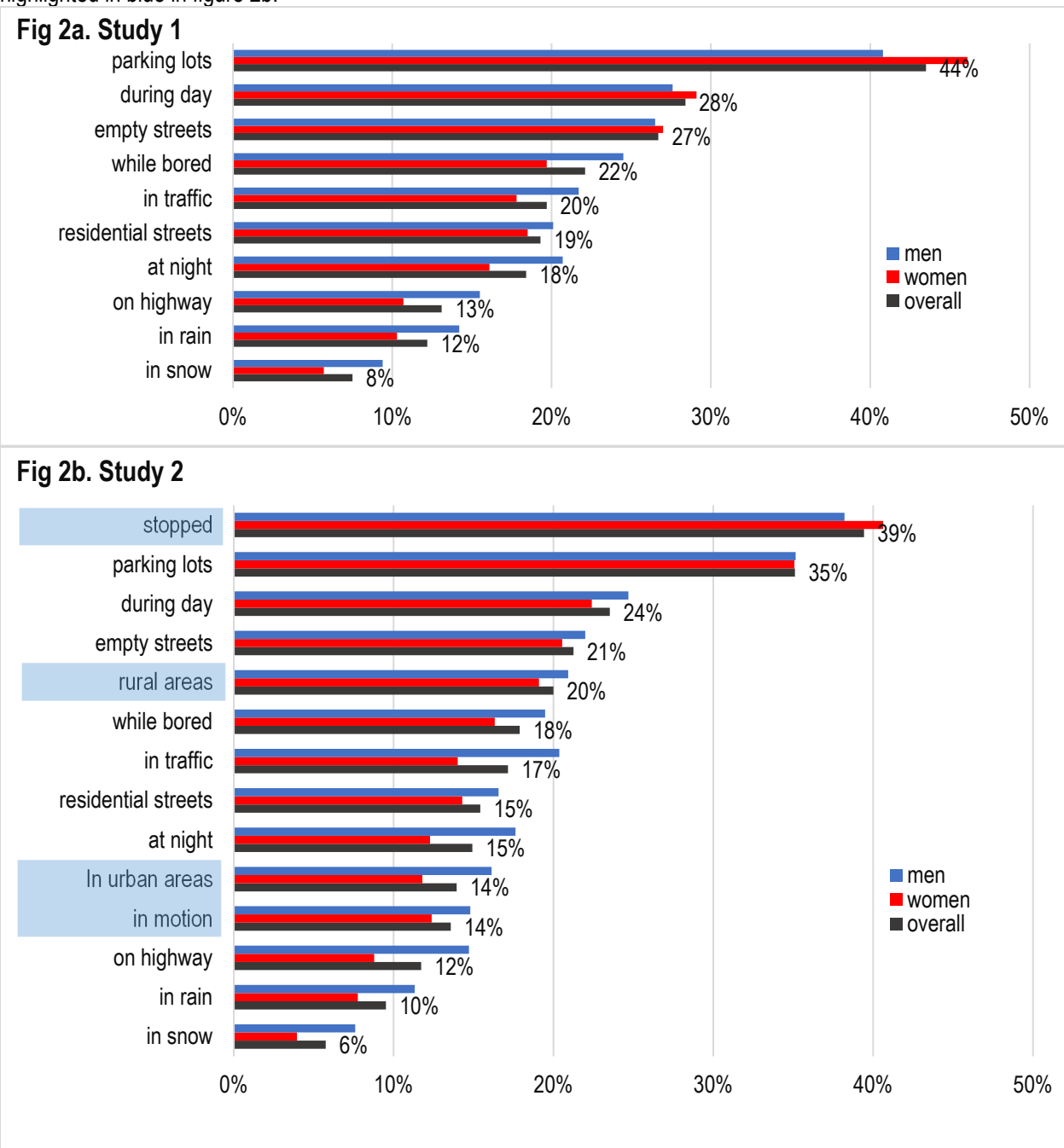


Figure 2. Prevalence of cell phone use in specific situations. Participants reported the likelihood (0-100%) that they would use their phone while driving in each situation. Situations are ordered from most to least reported distracted driving. Study 1 results appear in Panel a; Study 2 are in Panel b. In Study 2, we added additional categories based on traffic safety practitioner feedback (i.e., in motion, stopped, rural areas, urban areas) that are highlighted in blue in figure 2b.



Overall, many participants reported never driving distracted. The most common response for most of the behaviors and situations was 0%, and the average responses never exceeded 50% (Table1).

Table 1. Prevalence of distracted driving behaviors and situations in Studies 1 and 2. Participants responded on scales from 0-100%. Average response overall (N=389; 648) and for women (N=195; 327) and men (N=191; 321) separately. "% never" is the percentage of respondents who responded that they did the behaviors 0% of the time.

	Study 1				Study 2			
	Overall (N=389)	Women (N=195)	Men (N=191)	% never	Overall (N=648)	Women (N=327)	Men (N=321)	% never
"When driving, what percentage of the time do you…" (0-100%)								
Adjust music/radio/song/playlist/podcast	47.0%	48.0%	46.0%	3.4%	---	---	---	---
Adjust audio using dash	---	---	---	---	34.5%	32.5%	36.6%	11.1%
Change audio w/ dash	---	---	---	---	31.9%	30.6%	33.2%	17.9%
Adjust audio using steering wheel/hands free	---	---	---	---	25.6%	26.2%	25.1%	39.5%
Change audio w/ steering wheel/hands free	---	---	---	---	23.4%	23.3%	23.6%	44.8%
Adjust GPS, maps, etc.	24.8%	23.9%	25.8%	13.7%	---	---	---	---
Check GPS, maps, etc. using phone	---	---	---	---	20.7%	19.3%	22.1%	31.3%
Check GPS, maps, etc. using dash	---	---	---	---	13.7%	12.6%	14.8%	54.0%
Change audio w/ phone	---	---	---	---	12.1%	11.7%	12.5%	64.0%
Hold phone conversations	13.3%	14.7%	11.9%	22.0%	11.4%	11.5%	11.4%	29.5%
Search phone for specific media	---	---	---	---	9.6%	7.6%	11.6%	63.6%
Read text messages	11.6%	10.5%	12.8%	39.1%	8.5%	8.6%	8.5%	46.5%
Send text messages	8.3%	7.3%	9.3%	51.3%	6.3%	6.1%	6.5%	59.3%
Use phone for any other reason (e.g., social media or apps not mentioned)	7.8%	5.4%	10.3%	58.8%	7.3%	6.2%	8.4%	63.3%
Watch movies/shows on your phone	3.3%	1.8%	4.7%	86.3%	2.9%	2.5%	3.4%	87.2%
"How likely are you to use your phone while driving …" (0-100%)								
While stopped	---	---	---	---	39.4%	40.6%	38.2%	10.3%
In parking lots	43.5%	46.1%	40.8%	7.3%	35.1%	35.1%	35.2%	16.5%
During the day	28.4%	29.1%	27.6%	11.4%	23.5%	22.4%	24.7%	22.1%
On empty streets	26.7%	27.0%	26.5%	12.7%	21.3%	20.5%	22.0%	26.2%
In rural areas	---	---	---	---	20.0%	19.1%	20.9%	28.5%
While bored	22.1%	19.7%	24.5%	26.4%	17.9%	16.3%	19.5%	45.7%
In traffic	19.7%	17.8%	21.7%	27.5%	17.2%	14.0%	20.4%	40.1%
On residential streets	19.3%	18.5%	20.1%	19.9%	15.4%	14.3%	16.6%	33.3%
At night	18.4%	16.1%	20.7%	21.5%	14.9%	12.3%	17.6%	34.0%
In urban areas	---	---	---	---	13.9%	11.8%	16.1%	40.9%
In motion	---	---	---	---	13.6%	12.4%	14.8%	33.6%
On the highway	13.1%	10.7%	15.5%	37.3%	11.7%	8.8%	14.7%	49.2%
In rain	12.2%	10.3%	14.2%	35.0%	9.5%	7.8%	11.3%	49.8%
In snow	7.5%	5.7%	9.4%	55.7%	5.8%	4.0%	7.6%	65.3%

Participants also appeared to be sensitive to how dangerous situations and behaviors were and reported lower rates of objectively more vs. less dangerous distracted driving. For example, adjusting audio (across methods) was the most prevalent distracted behavior, with an average self-report of 47% of trips in Study 1 and 23-35% in Study 2. The average prevalence for talking on the phone, sending and reading texts, using the phone for anything else not listed, and watching movies were all lower, less than 20%. More than half of respondents reported that they never sent text messages and the vast majority never watched movies. Similarly, average likelihood ratings for driving distracted in the rain, snow, at night, on the highway, and on residential streets were all less than 20%, whereas average likelihood for driving distracted in parking lots was over 40% in Study 1 and over 35% in Study 2. In Study 2 we added a question about cell phone use while the car was in motion: roughly 2/3 (66.4%) of people admitted to using their phones while the car was in motion. 11.2% reported cell phone use on 50% or more trips, 26.0% on 10-49% of trips, 30.1% on 1-9% of trips, and only 33.6% reporting that they never use their phones while driving.

The distracted driving behaviors and situations were interrelated (i.e., people tended to drive distracted across many situations and behaviors or not drive distracted). Thus, for ease of interpretation, we combined them into a single index of distracted driving (Cronbach's α = .93; .94).

Distracted driving was predicted by

1. **Higher perceived prevalence in others** (i.e., in both Study 1 and Study 2, people who thought others drove distracted a lot drove distracted more themselves)
2. **Overconfidence** (i.e., in both studies, people who thought that they were better than others at driving distracted reported more distracted driving)
3. **Positive attitudes towards cell phones** (i.e., in both studies, people who were attached to their phone and perceived more benefits to using their phone while driving reported greater distracted driving)
4. **Lower risk perceptions** (i.e., people who didn't think that distracted driving was very risky reported more distracted driving) in Study 1
5. **Greater reactance to messaging** (i.e., reporting negative emotions to messaging, believing risks are overblown or exaggerated). In Study 2, we tested a new measure of reactance to distracted driving messaging that predicted distracted driving better than the measure of risk perceptions used in Study 1.
6. **Demographic variables** (i.e., in Study 1, men drove distracted more than women. Age and race were also recorded, but didn't predict distracted driving. In Study 2, age, but not gender or race, predicted distracted driving when controlling for the other variables: older people reported less distracted driving)
7. **Lower verbal intelligence** (i.e., in both studies, people with lower verbal intelligence reported driving distracted more than those with higher verbal intelligence. Math ability and spatial reasoning were also assessed, but didn't predict distracted driving)

Attitudes toward mitigation strategies

Participants were asked about a variety of policies, programs, and technology that could be used to reduce distracted driving (Fig 3 and Table 2). Broadly speaking, participants seemed to view most strategies at least moderately positively. Participants were particularly supportive of programs to improve teen driving, insurance discounts, and fines for distracted driving. The lowest support was for laws that ban cell phones, technology that detects distraction and pulls the car over, and sensors in steering wheels that warn drivers to keep both hands on the steering wheel.

Figure 3. Support for mitigation strategies in Studies 1 (a) and 2 (b). Strategies were rated from 1 *strongly opposed* to 6 *strongly in favor*. The midpoint of the scale appears as a black line.

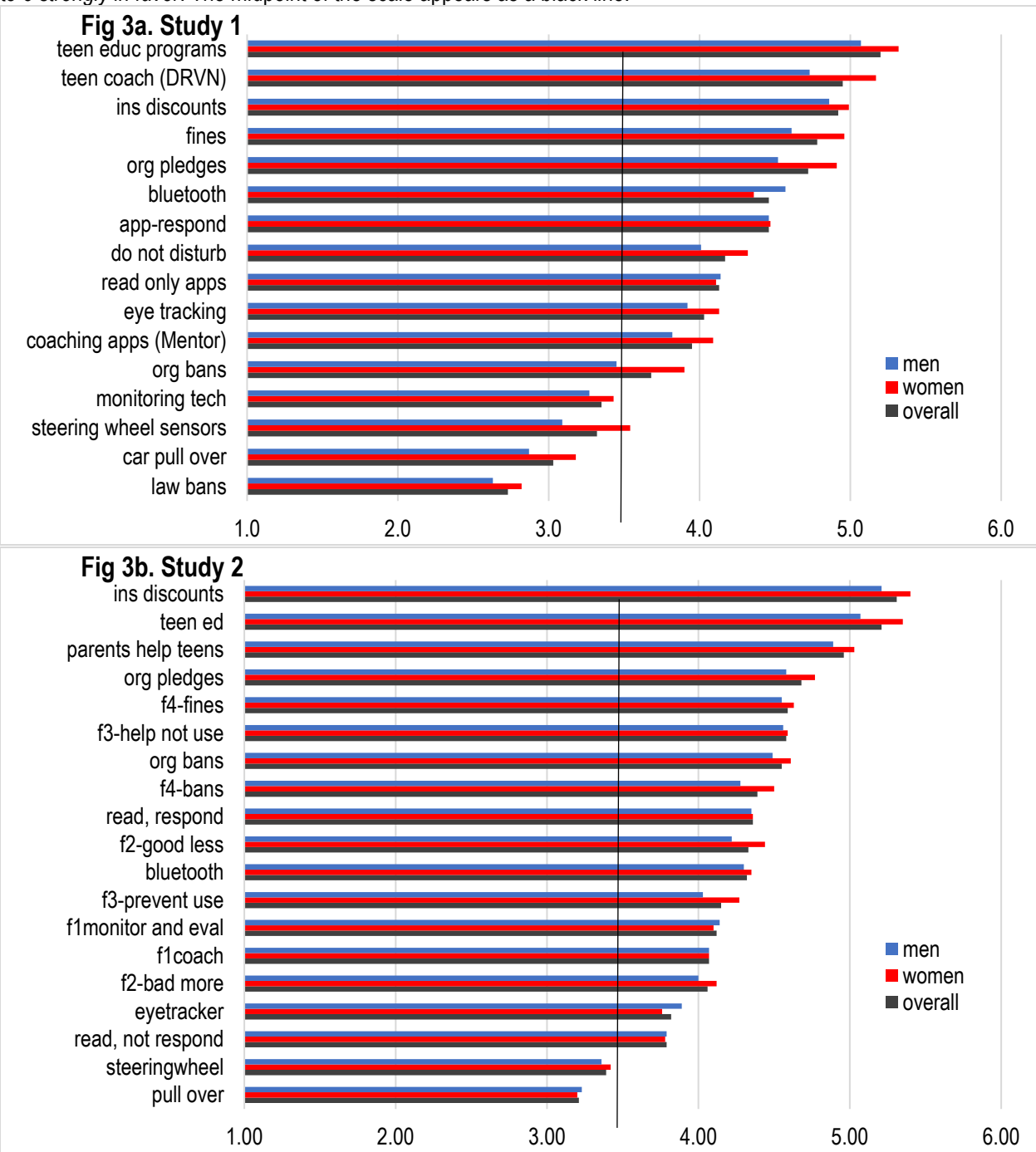


Table 2. Average support for programs, policies, and technology to reduce distracted driving. Participants rated their support on a scale from 1 *strongly opposed* to 6 *strongly in favor*. Average response overall (N=389; 648) and for women (N=195; 327) and men (N=191; 321) separately. In Study 2, in order to match the language used as much as possible to test effects of framing, we removed examples that appeared in parentheses.

Are you in favor of or opposed to _____?	Study 1 (N=389)			Study 2 (N=648)		
	Overall	Women	Men	Overall	Women	Men
Educational programs targeted at teen drivers	5.2	5.3	5.1	5.2	5.4	5.1
Technology that assists parents in teaching teen drivers (e.g., DRVN app)	5.0	5.2	4.7	5.0	4.0	4.9
Insurance discounts or plans for safe drivers (e.g., "Safe Driver Insurance Plan" from Ohio Mutual, "Safe Driver Discount" from Nationwide, Root Insurance plans)	4.9	5.0	4.9	5.3	5.4	5.2
Legislature and laws that punish distracted drivers with fines	4.8	5.0	4.6	---	---	---
Organizational (e.g., school or workplace) pledges to not drive distracted	4.7	4.9	4.5	4.7	4.8	4.6
Technology that gives you the option to read your texts and other messages aloud and allows you to send a speech-to-text response while driving (e.g., Android Auto, Apple Car Play)	4.5	4.5	4.5	4.4	4.4	4.4
Blue tooth while driving	4.5	4.4	4.6	4.3	4.4	4.3
Apps or settings that prevent you from using your phone while driving (e.g., Cell Control, iPhone do not disturb setting)	4.2	4.3	4.0	4.2	4.3	4
Technology that automatically reads your texts and other messages (including email) aloud and sends an automatic response, but does not allow you to respond through speech-to-text while driving	4.1	4.1	4.1	3.8	3.8	3.8
Eye tracking technology in your car that warns you when you're distracted	4.0	4.1	3.9	3.8	3.8	3.9
Technology that measures driver behavior patterns and coaches driving ability (e.g., Mentor by eDriving)	4.0	4.1	3.8	4.1	4.1	4.1
Organizational (e.g., school or workplace) bans on cell phone use	3.7	3.9	3.5	4.6	4.6	4.5
Technology that employers or insurance companies use to monitor driving ability (e.g., SmartDrive)	3.4	3.4	3.3	---	---	---
Steering wheel sensors that warns you to keep both hands on the steering wheel	3.3	3.5	3.1	3.4	3.4	3.4
Technology that pulls your car over if it detects you are distracted	3.0	3.2	2.9	3.2	3.2	3.2
Legislature and laws that ban cellphones	2.7	2.8	2.6	---	---	---
Legislature and laws that *ban cell phone use while driving*	---	---	---	4.4	4.5	4.3
legislature and laws that *punish people who use their cell phones while driving with fines*	---	---	---	4.6	4.6	4.6
Technology that *monitors driving ability and evaluates performance*	---	---	---	4.1	4.1	4.1
Technology that *measures driver behavior patterns and coaches driving ability*	---	---	---	4.1	4.1	4.1
Insurance programs that monitor for DD and safety and charge *poor drivers more*	---	---	---	4.1	4.1	4.0
Insurance programs that monitor for DD and safety and charge *good drivers less*	---	---	---	4.3	4.4	4.2
Apps or settings that *prevent you from using your phone while driving*	---	---	---	4.2	4.3	4.0
Apps or settings that *help you drive without using your phone*	---	---	---	4.6	4.6	4.6

In Study 1, although cell phone bans mean that a driver will be pulled over and fined, participants were far more supportive for fines for distracted driving (average rating 4.8 out of 6) than bans (average rating 2.7 out of 6).

In Study 2, we more systematically matched items in order to compare the effects of framing. Participants were exposed to both frames. Although participants didn't differ in their support for monitoring and evaluation vs. measuring and coaching, we did observe that "fines" were more supported than "bans," "charging good drivers less"

was preferred to “charging poor drivers more” and technology that “helps you drive without using your phone” was preferred to technology that “prevents you from using your phone while driving.”

As with the distracted driving behaviors, the attitudes towards the various mitigation methods were related, so we created an index of reduction attitudes (Cronbach’s α=.82, .89).

Support for mitigation strategies was predicted by:

1. **Distracted driving behavior** (i.e., people who drive distracted show less support for distraction mitigation)
    a. In Study 2, distracted driving didn’t predict support for mitigation, but **reactance** did (i.e., greater negative reactions to influence attempts predicted less support for distraction mitigation)
2. **Risk perceptions** (i.e., people who perceive distracted driving as risky were more supportive of distracted driving mitigation)
3. **Positive attitudes towards cell phones** (i.e., people that had more positive attitudes towards cell phones, were attached to their phones, and saw more benefit to using their cell phones while driving were more supportive of distracted driving mitigation)
4. **Overconfidence** (i.e., people who belief that their driving ability is better than others were more supportive of distraction mitigation in Study 1)
5. **Verbal intelligence** (i.e., higher verbal intelligence was associated with less support for mitigation)
6. **Subjective numeracy** (i.e., higher perceived math ability was associated with more support for mitigation in Study 2)
7. **Numeric magnitude estimation** (i.e., people with a better intuitive sense of the relative size of numbers were less likely to support mitigation strategies in Study 2)

Use of distracted driving mitigation strategies

We asked participants to report if they'd used any of the mitigation strategies. Just over half (53%) had used Bluetooth, but "none" was the next most common answer (28%; Table 3, Figure 4a) in Study 1. In Study 2, use was largely similar, but in general use of mitigation strategies increased slightly (Table 3, Figure 4b).

Figure 4a. Use of distracted driving mitigation strategies in Study 1.

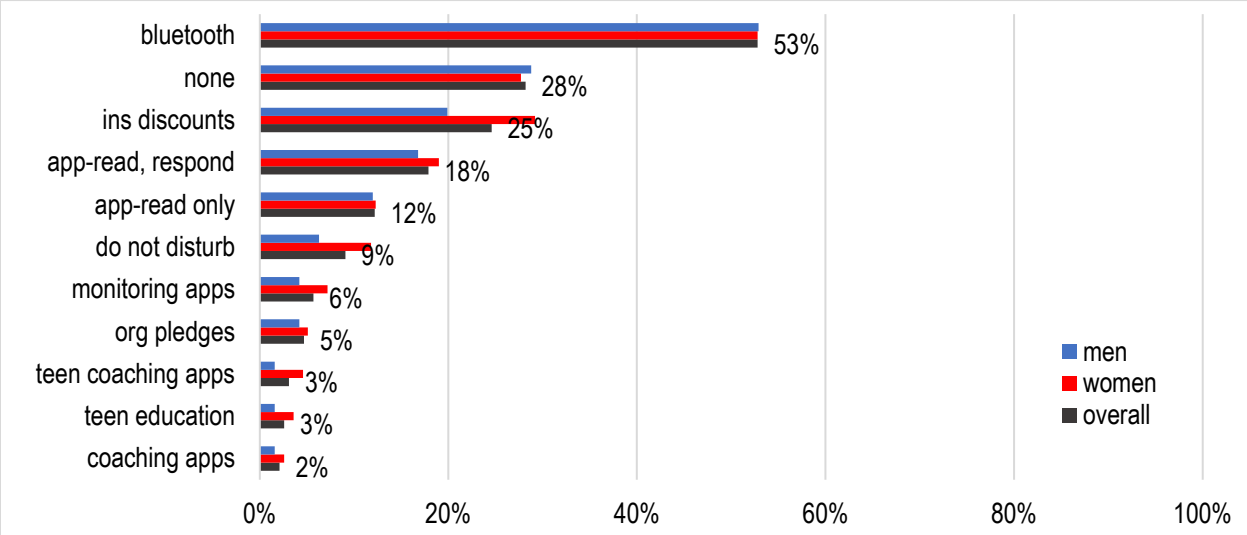


Figure 4b. Use of distracted driving mitigation strategies in Study 2.

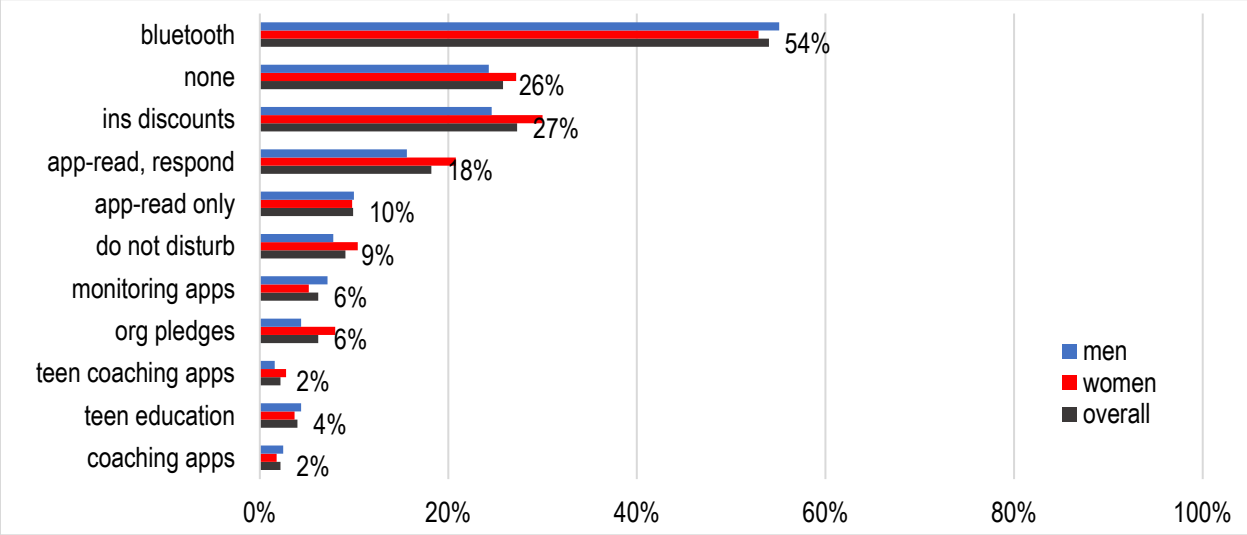


Table 3. Use of mitigation strategies. Percent of respondents who reported ever using various distraction mitigation strategies.

	Study 1 (N=389)			Study 2 (N=648)		
	overall	women	men	overall	women	men
Blue tooth while driving	52.8%	52.8%	52.9%	54.0%	52.9%	55.1 %
None	28.2%	27.7%	28.8%	25.8%	27.2%	24.3 %
Insurance discounts or plans for safe drivers (e.g., "Safe Driver Insurance Plan" from Ohio Mutual, "Safe Driver Discount" from Nationwide, Root Insurance plans)	24.6%	29.2%	19.9%	27.3%	30.0%	24.6 %

Technology that gives you the option to read your texts and other messages aloud and allows you to send a speech-to-text response while driving (e.g., Android Auto, Apple Car Play)	17.9%	19.0%	16.8%	18.2%	20.8%	15.6 %
Technology that automatically reads your texts and other messages (including email) aloud and sends an automatic response, but does not allow you to respond through speech-to-text while driving	12.2%	12.3%	12.0%	9.9%	9.8%	10.0 %
Apps or settings that prevent you from using your phone while driving (e.g., Cell Control, iPhone do not disturb setting)	9.1%	11.8%	6.3%	9.1%	10.4%	7.8%
Technology that employers or insurance companies use to monitor driving ability (e.g., SmartDrive	5.7%	7.2%	4.2%	6.2%	5.2%	7.2%
Organizational (e.g., school or workplace) pledges to not drive distracted	4.7%	5.1%	4.2%	6.2%	8.0%	4.4%
Technology that assists parents in teaching teen drivers (e.g., DRVN app)	3.1%	4.6%	1.6%	2.2%	2.8%	1.6%
Educational programs targeted at teen drivers	2.6%	3.6%	1.6%	4.0%	3.7%	4.4%
Technology that measures driver behavior patterns and coaches driving ability (e.g., Mentor by eDriving)	2.1%	2.6%	1.6%	2.2%	1.8%	2.5%

Perceptions of evidence that distracted driving is dangerous
We gave Study 1 participants a short description of an early study published in the New England Journal of Medicine that found car accident risk was 4 times higher while using cellphones (Redelmeier & Tibshirani, 1997). Participants rated how credible and convincing they found the study.

Perceptions that the study was more credible and convincing were associated with

1. **Attitudes towards mitigation strategies** (i.e., people who were more in favor of the various methods to reduce distracted driving found the study more convincing)
2. **Risk perceptions** (i.e., the more people rated distracted driving as risky, the more convinced they were by the study)
3. **Age** (i.e., younger people were more convinced by the study)

In Study 2, participants read about the results of Study 1. Specifically, they were given either a nonnumeric message:

> In a recently conducted study of American drivers on Mturk, the vast majority of drivers agreed with the statement "**People who use cell phones while driving are acting irresponsibly**." In addition, drivers report that they do not text the large majority of the times that they drive.

Or a numeric message:

> In a recently conducted study of American drivers on Mturk, 89.1% of drivers agreed with the statement "**People who use cell phones while driving are acting irresponsibly**." In addition, drivers report that they do not text 92.3% of the times that they drive.

Participants rated the study for how credible, convincing, and believable it was. These ratings were predicted by:

1. **Message condition** (i.e., nonnumeric message was perceived more positively than the numeric message—surprisingly this was true irrespective of actual or perceived numeric ability)
2. **Attitudes towards mitigation strategies** (i.e., people who were more in favor of the various methods to reduce distracted driving found the study more convincing)
3. **Risk perceptions** (i.e., the more people rated distracted driving as risky, the more convinced they were)
4. **Gender** (i.e. women were less convinced by the study than men)
5. **Race** (i.e., white people were less convinced by the study than nonwhites)
6. **Cell phone attitudes** (i.e., people with higher cell phone attitudes found our study *more* convincing)
7. **Overconfidence** (i.e., people who felt they were better at cell phone use while driving felt more positively towards the study)

Reactance to messaging
For Study 2, we developed a 6-item measure of reactance based on prior research on tobacco graphic warning labels. Items ask about having negative emotional reactions to the messages and rejecting risks or messaging (e.g., "messages about distracted driving make me feel aggravated," "the risks of distracted driving are overblown"). Higher reactance was correlated with lower support for mitigation strategies and lower ratings of anti-distraction messaging. Future research will use this measure as a moderator of messaging success and potentially a variable to develop different messaging for.

Reactance was predicted by

1. **Risk perceptions** (i.e., lower risk perceptions for driving distracted predicted greater reactance)
2. **Positivity towards phone** (i.e., greater perceived benefits of cell phone predicted greater reactance)
3. **Attitudes towards phones and driving** (i.e., people who like driving, don't like phones were more reactant)
4. **Driving time** (i.e., people who drove more hours per week had higher reactance)
5. **Verbal intelligence** (i.e., higher verbal intelligence was associated with lower reactance)
6. **Subjective numeracy** (i.e., greater perceived math ability was associated with lower reactance)