## Factors Associated with Cell Phone Use While Driving: A Survey of Parents and Caregivers of Children Ages 4-10 Years

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**Objectives** To examine characteristics associated with cell phone use while driving by parents and caregivers of children ages 4-10 years.

**Study design** National cross-sectional online survey with a convenience sample (March 2017-April 2017). Inclusion criteria: Parent/caregiver of a child age 4-10 years in their home, age ≥18 years, read and spoke English, and drove child ≥6 times in previous 3 months. Adjusted logistic regression analyses were modeled for outcome measures of previous 3-month self-report cell phone use while driving with the child.

**Results** The analytic sample was n = 760. In the previous 3 months, 47% of parent/caregivers talked on a handheld phone, 52.2% talked on a hands-free phone, 33.7% read texts, 26.7% sent texts, and 13.7% used social media while driving with their child in the vehicle. Compared with those who always used their typical child restraint system, participants who did not always use were more likely to talk on a hands-free phone (aOR 1.97, 95% CI 1.26-3.09), read a text (aOR 1.74, 95% CI 1.11-2.73), send a text (aOR 1.65, 95% CI 1.04-2.62), and use social media (aOR 2.92, 95% CI 1.73-4.94) while driving. Higher income, not wearing a seat belt (driver) on every trip, and driving under influence of alcohol also were associated with various types of cell phone use while driving.

**Conclusions** Inconsistent child restraint system use, lack of seat belt use, and driving under the influence of alcohol are associated with parent/caregiver cell phone use while driving. Screening and education related to parental driving behaviors should include addressing multiple risk behaviors. (*J Pediatr 2018*;

otor vehicle crashes remain a leading cause of injury and death in children.<sup>1</sup> In the US, 2015 saw a 5% increase of motor vehicle fatalities of children 14 years of age and younger.<sup>2</sup> A number of factors can contribute to motor vehicle crash injuries and fatalities in the pediatric population, including misuse of child restraint systems (CRSs) and adult risky driving behaviors.<sup>3</sup>

Distracted driving is a risky driving behavior that is a public health crisis. Overall US distracted driving crash fatalities reached 3477 in 2015, with an additional 330 000 individuals injured.<sup>4</sup> Parents and caregivers are not immune to distracted driving when their child is in the vehicle. In a survey of parents and caregivers in 2011-2012 screened in an emergency department, over 60% reported talking on a hand-held phone, 35% talking on a hands-free phone, and 15% using the phone to text, email, or use the internet, all while their children were in the car and the car was moving.<sup>5</sup>

Other risky driving behaviors besides cell phone use while driving also put child occupants at risk for injury or death. In fatal crashes in 2015, when drivers were unrestrained, 66% of children also were unrestrained; of the children who died in alcohol impaired crashes, 51% were occupants of vehicles where drivers had blood alcohol contents of .08 g/dL or higher.<sup>6</sup> Suboptimal compliance with CRS recommendations can also contribute to crash-related injury.<sup>7-9</sup> A high-risk group for suboptimal com-

pliance includes children who should be in booster seats, typically from ages 4-10 years. Data from 2015 indicate that children ages 1-3 years are restrained at rates of approximately 94%, with the restraint rates falling to approximately 86% for children ages 4-7 years. In addition, the 2015 National Survey of the Use of Boosters Seats indicates that nearly 26% of children ages 4-7 years old "graduate" out of booster seats to seat belts prior to readiness and nearly 12% are unrestrained, creating a vulnerability to risk for injury if a crash does occur.

Given that risky driving behaviors often co-exist, <sup>12-15</sup> it is likely that those who use a cell phone while driving also engage in other behaviors that put their child occupants at risk for injury or death. The purpose of this study was to describe the factors that are associated with cell phone-related distracted driving in parents and caregivers of children ages 4-10 years. We examined the association of demographic factors, CRS use, history of alcohol-impaired driving, and seat belt use with cell phone-related distracted driving behaviors. We hypothesized that

CRSs Child restraint systems
REF Reference

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inconsistency of CRS use, history of alcohol-impaired driving, and lack of seat belt use while driving would be associated with increased cell phone use while driving.

#### Methods

We used a national cross-sectional online survey with a convenience sample to collect data on caregiver utilization of CRS use and distracted driving behaviors in the US. The survey included a brief 6-question screener to determine eligibility for a longer survey and those who were eligible were directed to procedures for the longer survey.

We recruited individuals to meet the following inclusion criteria: ≥ age 18 years; English-speaking; parent or routine caregiver of child between ages 4-10 years; and had driven his or her oldest child between ages 4-10 years at least 6 times in the past 3 months. Participants were recruited via Turk Prime, an online crowdsourcing platform that specifically targets participant enrollment from mTurk (Mechanical Turk) for academic research purposes. mTurk and Turk Prime have been used in behavioral science surveys and also targeted clinical populations. 16-19 The demographic characteristics of respondents from mTurk are often found to be more educated, less diverse, and have a higher income than a nationally representative sample.<sup>20</sup> However, TurkPrime was created to optimize the functionality of mTurk and provides advantages over other online subject recruitment platforms, including efficiency, fast and easy access to research participants, a payment system to compensate and maintain anonymity, a mechanism to prevent participation multiple times by the same individual, and processes to maintain confidentially.16

Participants who clicked on study recruitment materials in Turk Prime were directed to a brief (6-question) screener developed in Qualtrics (Provo, Utah). The screener was constructed to collect data on eligibility and, thus, included questions on whether they were a parent or caregiver of one or more children in their home, age, sex, ability to read and speak English, age of child(ren), and whether they drove the oldest child between the age of 4-10 years 6 or more times in the past 3 months. All participants were automatically compensated \$0.20 (US dollar) for completing the screener, whether or not they met eligibility criteria for the longer survey. Participants who did not meet eligibility criteria were directed to information that thanked them for their time and informed them they were not eligible for the longer survey.

Participants who met eligibility criteria were informed of their eligibility, given study information, provided an online consent document and instructions for the longer survey about driving behaviors, and child passenger safety practices in Qualtrics. The electronic consent document contained information on the purpose of the study, voluntary participation, approximate time to complete the survey, the anonymity of their data, and compensation information. Consent was obtained by choosing "yes" to consent to take the survey and they were directed to the survey. Participants were instructed to

answer the child-specific questions related to their oldest child between ages 4-10 years. Participants whose oldest child between the ages of 4 and 10 years that most frequently used a car seat were directed to a survey where car seats were the referred type of CRS. Participants whose oldest child most frequently used a booster seat, seat belt, or none of the above were directed to a survey where booster seats were the referred type of CRS. Participants who successfully completed the longer survey were compensated an additional \$2.00. We deployed a pilot survey on March 1, 2017 in Qualtrics with mTurk with 57 participants; we then deployed the full survey from March 6, 2017 to April 27, 2017. The survey was deployed in batches so that up to 1500 participants could complete the screener in 1 batch. Data collection ended on April 27, 2017. Participant data was deidentified. This study received exempt status from the University of Pennsylvania Institutional Review Board.

#### **Measures**

We modified items from Macy et al to collect data on cell phone use while driving, CRS use, seat belt use while driving, and driving under the influence of alcohol.<sup>5</sup> The modification included querying a 3-month period and adding specificity to the distracted driving questions related to texts (reading and sending) and social media.

Cell Phone Use while Driving. We collected data on self-report of cell phone use while driving in the last 3 months while their oldest child between ages 4 and 10 years was in the car and the car was moving (ie, not stopped at a light). The 5 specific cell phone behaviors queried were reading a text, sending a text, hands-free cell phone calls, hand-held cell phone calls, and use of social media. The options were never, once or twice, >once or twice but <one-half of trips, >one-half of trips but not every trip, and every trip. For analysis, participants' responses on frequency were also recoded to 2 groups: "never" (those who chose never) and "≥1 times" (all other responses).

Typical Child Restraint System Use. We collected data on self-report type of CRS typically used for their oldest child between ages 4 and 10 years (booster, seat belt, car seat, or none of the above) in the last 3 months. We then asked the frequency of use of that CRS. Answers included never, once or twice, >once or twice but <one-half of trips, >one-half of trips but not every trip, and every trip. Participants' responses on frequency were recoded to 2 groups: "every trip" (those who chose every trip) and "not every trip" (all other responses). Those who chose "none of the above" as the CRS typically used were excluded from the analysis (n = 23).

Seat Belt Use while Driving. We collected data on their self-reported driver seat belt use while driving in the last 3 months. The item "In the last 3 months, how often did you ever, at any time (no matter if your children were in the car or not), use a seat belt when you were driving" had the following response options: never, once or twice, >once or twice but <one-half of trips, >one-half of trips but not every trip, and every trip. Participants' responses were also recoded to 2 groups:

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