HHS Public Access

Author manuscript

Acad Pediatr. Author manuscript; available in PMC 2015 May 01.

Published in final edited form as:

Acad Pediatr. 2014 ; 14(3): 279–286. doi:10.1016/j.acap.2014.02.010.

Potential Distractions and Unsafe Driving Behaviors Among Drivers of 1- to 12-year-old Children

Michelle L. Macy, MD, MS[1,2,3], **Patrick M. Carter, MD**[1,3], **C. Raymond Bingham, PhD**[3,4], **Rebecca M. Cunningham, MD**[1,3], and **Gary L. Freed, MD, MPH**[2]

[1]Department of Emergency Medicine, University of Michigan, Ann Arbor, MI

[2]Child Health Evaluation and Research (CHEAR) Unit, Division of General Pediatrics, University of Michigan, Ann Arbor, MI

[3]University of Michigan Injury Center, Ann Arbor, MI

[4]University of Michigan Transportation Research Institute (UMTRI), Ann Arbor, MI

Abstract

Objective—Driver distraction has been identified as a threat to individual drivers and public health. Motor vehicle collisions remain a leading cause of death for children yet little is known about distractions among drivers of children. This study sought to characterize potential distractions among drivers of children.

Methods—A two-site, cross-sectional, computerized survey of child passenger safety practices was conducted among adult drivers of 1- to 12-year-old children who presented for emergency care between October 2011-May 2012. Drivers indicated the frequency with which they engaged in ten potential distractions in the past month while driving with their child. Distractions were grouped in four categories: 1) non-driving, 2) cellular phone, 3) child, 4) directions. Information about other unsafe driving behaviors and sociodemographic characteristics was collected.

Results—Nearly 90% of eligible parents participated. Analysis included 570 (92.2%) drivers. Non-driving and cellular phone-related distractions were disclosed by >75% of participants. Fewer participants disclosed child (71.2%) and directions-related distractions (51.9%). Child age was associated with each distraction category. Cellular phone-related distractions were associated with the child riding daily in the family car, non-Hispanic white and other race/ethnicity, and higher education. Parents admitting to drowsy driving and being pulled over for speeding had over two-times higher odds of disclosing distractions from each category.

Correspondence: Michelle L. Macy, University of Michigan, Division of General Pediatrics, 300 North Ingalls 6C13, Ann Arbor, MI 48109-5456, Phone: 734.936.8338, Fax: 734.764.2599, mlmacy@umich.edu.

Financial Disclosure Statement: The authors have no financial relationships to disclose.

Conflicts of Interest Statement: The authors have no Conflicts of Interest to disclose.

Conclusions—Distracted driving activities are common among drivers of child passengers and associated with other unsafe driving behaviors. Child passenger safety may be improved by preventing crash events through the reduction or elimination of distractions among drivers of child passengers.

Keywords

accident prevention; child passenger safety; driving distractions; survey

Introduction

Driver inattention contributes to motor vehicle crashes (MVCs) and near-crash events.[1] Driver distraction, one form of driver inattention,[2] has been identified as a threat to both the individual driver and to public health.[3–5] Driver distractions can range in manual and visual complexity from simple (e.g., adjusting the radio) to complex (e.g., dialing a hand-held device).[1] Prior national surveys of adult drivers have found that cellular-phone related distractions are prevalent, about two-thirds of adult drivers talk on cellular phones and about one-third of drivers text while driving.[6–8]

Using a cellular phone can result in significant impairment and greatly increase crash risk.[9] Approximately one in six fatal MVCs in the United States (U.S.) in 2008 resulted from driver distraction and over time increased percentages of fatal crashes have been attributed to cellular phone use specifically.[3] In addition to the growing concerns over distracted driving, excessive speed and alcohol have persisted as key factors in fatal crashes[10] and drowsy driving has gained attention as a cause of many MVCs [11,12] In combination, driver distraction and impairment from substances or drowsiness interact to reduce driving precision and increase driving errors and distractions.[13,14]

MVCs remain a leading cause of death for U.S. children[15] yet little is known about behaviors that increase crash risk among drivers of children. To date, much distracted driving research has focused on cellular phone use among teens and young adults.[16–18] Few studies have concentrated on distractions or impairment among the actual drivers of child passengers.[19–22] In this study we sought to characterize potential distractions among drivers of children 1 to 12 years of age and to explore the relationships between potential driver distractions and other unsafe driving behaviors, including suboptimal child restraint use and child seat location. These analyses were conducted in order to inform future research efforts to improve child passenger safety and to generate hypotheses about the role of child passengers in driver distraction.

Methods

Study Design—A two-site, cross-sectional, computerized survey of child passenger safety practices among parents and caregivers seeking emergency care for their 1- to 12-year-old child was conducted at the University of Michigan (UM) C.S. Mott Children's Hospital Emergency Department (ED) in Ann Arbor, MI and the Hurley Medical Center (HMC) ED

in Flint, MI between October 2011 and May 2012. The Institutional Review Boards of the UM Medical School and HMC approved the study.

Setting—The UM Pediatric ED is a suburban, tertiary care, academic hospital with a predominantly white and privately insured patient population. The HMC ED is an urban community hospital. The patient population seen in the HMC ED consists of higher proportions of African American children and children covered by Medicaid compared with UM. Text messaging has been banned for all drivers in Michigan since 2010 but there are no state-wide restrictions on cellular phone use for adult drivers.[23]

Subjects—Parents and caregivers arriving to the ED with their 1- to 12-year-old child were potentially eligible for the study. Parents were not approached if their child was critically ill or injured, was under evaluation for suspected child abuse, or was going to be admitted to the hospital. Parents were excluded if they were <18 years, did not speak English, or if their child required a special passenger restraint (e.g., a travel vest or wheelchair). Using a measuring tape, the research staff determined the height of children of parents who were potentially interested in the study. Parents were excluded if their child was ≥4-feet-9-inches tall (the height at which an adult seat belt is expected to fit properly).

Survey Instrument—The study team developed survey questions to assess child passenger safety practices based on published literature[1,20,24] and pilot tested the instrument with 21 parents. Modifications were made to clarify confusing questions identified in pilot testing. Survey items (see Appendix) related to the results presented in this study had a Flesch-Kincaid grade level of 5.5, calculated using the built-in software in Microsoft Word 2010 (Microsoft Corporation, Redmond, Wash).

Survey Administration—Data collection occurred during high volume hours (2–9 p.m.) to maximize recruitment. Recruitment days were varied to ensure enrollment on weekdays and weekends. Research assistants, using a standard script, approached parents after the child was in their treatment room. Written informed consent was obtained after the research assistant reviewed study procedures. Responses were entered by parents directly on a study tablet computer using Qualtrics© (Qualtrics Labs, Inc.). Parents were offered a $20 incentive for survey completion and provided with contact information for local child passenger safety programs.

Measures

Potential Driver Distractions were the main variables of interest. Drivers were asked how often in the past month (ranging from 1=never to 4=almost every trip) they performed 10 potentially distracting activities while driving their child and the vehicle was moving (Appendix). The specific activities were drawn from published literature.[1,20] Potential distractions were categorized as: 1) **Non-Driving-Related:** eat/drink/smoke, groom (e.g., brush hair, shave), change a DVD/CD/tape; 2) **Cellular Phone-Related:** talk on hand-held cellular phone, talk on the phone using a hands-free device, text/email/browse the Internet; 3) **Child-Related:** give food to child, pick up a toy or game the child dropped; 4) **Directions-Related:** read map or printed directions, use an electronic navigation system.

Unsafe Driving Behaviors were assessed with fixed response questions. Participants were asked about their own seat belt use, driving in the past year while too sleepy to stay fully awake (drowsy driving), driving in the past year while feeling effects from alcohol, drugs, or medications (impaired driving), ever being pulled over for speeding, and ever having their driver's license suspended. The timeframes of one year and ever were selected in order to capture events that were expected to be rare. A one-year timeframe has been used in other studies of alcohol-impaired driving. [25] These unsafe driving behavior questions did not inquire about the presence of the child in the vehicle. Participants also reported if their child ever rides in the front seat and the types of passenger restraint used for their child. Sitting in the front seat was considered in terms of never vs. ever for analysis. Age-appropriate restraint use was defined as 1- to 3-year-old children using car seats, 4- to 7-year-old children using car seats or booster seats, and 8- to 12-year-old children using booster seats or seat belts based on Michigan Child Passenger Safety Law[26]. Because some parents selected more than one restraint type, age-appropriate restraint use was considered in terms of children who never used the age-appropriate restraint and those who did not always use the age-appropriate restraint based on the least protective restraint (or ever were unrestrained). For example, a 3-year-old reported to use a car seat and a booster seat was considered to use the booster seat for analyses. The least protective restrain selected was chosen for analysis because this represents the highest risk scenario if the child were involved in a crash. Drivers also provided sociodemographic information and the frequency of travel with their child based on fixed-choice response options. Frequency of travel was analyzed as every day vs. less than every day based on distribution of responses.

Analyses

Analyses were conducted on responses from participants who provided answers to each of the distracted driving items and sociodemographic characteristics. Descriptive statistics were calculated including proportions and medians with interquartile range (IQR) as appropriate. Child age was categorized based on the stages of child safety seat use. Some categories were combined for analyses based on the distribution of responses to parent race/ethnicity, parent age, education level, and frequency of travel with the child. Multivariable logistic regression analyses were conducted to test for associations between the four categories of potential driver distractions and 1) sociodemographic characteristics and 2) the eight unsafe driving behaviors adjusting for parent age, gender, race/ethnicity, education, child age, how often the child travels in their family vehicle, and study recruitment site. Parent age, gender, race/ethnicity, education, and child age, were included in the multivariable model as they were considered to be important potential confounders. Parent age "missing" was included as a separate category in analyses given the high degree of non-response for that variable. The frequency of travel in the family vehicle was included as a measure of exposure and study recruitment site was included because of the potential for different social norms for the driving behaviors between the two settings.

Results

Sample Characteristics

Among parents and caregivers presenting to the EDs with their child during study shifts, 81.1% were approached, and 89.9% of eligible parents consented to the survey. Of the 618 drivers surveyed, 570 (92.2%) completed all of the driver distraction and sociodemographic items and were included in analyses (Figure 1). Compared with non-Hispanic white parents, incomplete responses, were more common among non-Hispanic black parents and parents of other race/ethnicity (4.7% vs. 10.8% vs. 6.7%, p=0.03) but there were otherwise no meaningful differences between participants with complete and incomplete responses. Item non-response to the unsafe driving behaviors accounted for <2% of any finding. Participant drivers were mostly mothers (76.1%) and self-identified as non-Hispanic white (63.0%) (Table 1). Nearly one-third of drivers reported attaining a Bachelor's degree or higher education. Few drivers (2.3%) reported that there was no vehicle at their home. Recruitment was balanced between sites.

Potential Distractions When the Child is a Passenger

The median number of potential distractions disclosed was four (IQR 3–6). Forty-three drivers (7.7%) disclosed no potential distractions and four (0.7%) indicated that all 10 potential distractions had occurred during trips in the past month with their child. Figure 2 shows the frequency of potential distractions disclosed by participants. More than half of participants disclosed that they "eat/drink/smoke", "change a DVD, CD, tape", "talk on a hand-held cellular phone", and "give food to child" on at least some trips in the past month while their child was in the car and the car was moving. Less than 20% of participants disclosed that they "comb/brush hair, brush teeth, shave or put on makeup", "text/email/browse the Internet" or "read maps/printed directions".

Unsafe Driving Behaviors

Twenty percent of participants admitted to drowsy driving in the past year and 5.3% admitted to impaired driving. Half of the study drivers (50.3%) reported that they had ever been pulled over for speeding and 14.9% had previously had their license suspended or revoked. Report of not wearing a seat belt when driving was uncommon (5.6%) but 47.1% of participants reported not always wearing a seat belt as a passenger in the rear seat. One in ten participants indicated their child never uses an age-appropriate restraint and 20.0% did not always use an age appropriate restraint. One in ten children has been a front seat passenger.

Potential Distractions, Sociodemographic Characteristics, and Unsafe Driving Behaviors

Results of multiple variable logistic regression analyses to test for associations between disclosure of the four categories of potential distractions and sociodemographic characteristics are presented in Table 2. There were statistically significant associations between child age and each of the categories of potential distractions but these relationships differed across categories. For example, the adjusted odds of non-driving related distractions were two to four times higher among parents of 4 to 5 year olds and 6 to 7 year olds

compared with parents of 1 year olds. While the adjusted odds of child-related distractions were two times higher among parents of 2 to 7 year olds compared with parents of 1 year olds. Parent drivers who reported their child rode in the family car every day were more likely to disclose using cellular phones while driving. Compared with non-Hispanic black parents, non-Hispanic white parents reported more cellular phone, child, and directions-related distractions. Parents of other race/ethnicity reported more non-driving and directions-related distractions than non-Hispanic black parents. Higher education was associated with cellular phone and directions-related distractions.

Results of the multiple variable logistic regression analyses to test for associations between disclosure of the four categories of potential distractions and unsafe driving behaviors adjusting for sociodemographic characteristics are presented in Table 3. Parent drivers who admitted to drowsy driving and being pulled over for speeding had more than two times higher odds of disclosing potential distractions from each category. Parents who admitted to impaired driving in the past year had six times higher odds of disclosing child-related distractions. Prior license suspension and allowing the child to sit in the front seat were associated with non-driving related distractions. Parents who reported their child did not always use the age-appropriate restraint or allowed their child to sit in the front seat disclosed more child-related distractions.

Discussion

The most important finding of this study is that parents frequently engage in a variety of potentially distracting behaviors when driving their 1- to 12-year-old children. Parents in the study sample were no less likely to report engaging in cellular phone-related distractions while their child is a passenger than the general population[6–8,27] and other samples of parents[19,28] in the United States. Our study contributes to the literature on potential driving distractions among parents by examining activities beyond cellular phone use. Of the 10 potential distractions examined in this study, 90% of drivers disclosed engaging in at least one in the past month while driving their child in a vehicle that was moving. Notably, drivers responding to our survey admitted to giving food to their child while driving more frequently than they disclosed talking on a hand-held cellular phone, highlighting the need to consider multiple sources of driver distraction when children are passengers. The act of giving food to or picking up a toy for a child in a rear seat of a moving vehicle could require a driver to take their eyes of the road,[20] their hands off the wheel, and their attention away from the task of driving, which increases the risk of a crash.[1] There are no studies to our knowledge that have demonstrated the extent to which young child passengers are injured in MVCs that are attributable to distractions. This will be an important area for future research.

We also found that higher education and non-Hispanic white race were associated with cellular phone and direction-related distractions, which included use of navigation systems. Parents of higher socioeconomic status may have greater access to mobile technology, may be more willing to use technology while driving or more willing to disclose their use of technology while driving. If this finding is a result of greater access to technology among higher educated and non-Hispanic white parents, we can expect the problem of cellular phone use while children are passengers to expand as national rates of cellular phone

ownership among U.S. adults have climbed above 90%.[29] The lower frequency of text messaging/emailing/browsing the Internet compared with talking on a phone is consistent with other surveys of parents[19,28] and may relate to legislation restricting text messaging, which has been illegal in Michigan since 2010.[23] Further study is needed to determine the reasons that parent drivers are using technology while their vehicle is in motion in order to inform interventions to encourage parents to stop the use of mobile devices while driving. Regardless, engineering/technology interventions to block device use while the vehicle is in motion are potential approaches to decrease cellular phone-related distractions.

The child-related distractions assessed in this study were significantly associated with child age, with odds of reporting a child-related distraction being higher among parents of children between the ages of two and eight years than parents of one year olds. The relationship between child age and child-related distractions requires additional study. We hypothesize that our findings may stem from different parental responses to the demands or developmental needs of children in this age-range. Engagement in child-related distractions also appears to be associated with a general willingness to engage in more risky behaviors while driving, including drowsy driving, impaired driving, and speeding.

Another important consideration raised by our findings is the influence of parents' modeling of distracted and unsafe driving behaviors on the attitudes and behaviors of their children who will someday be learning to drive.[30,31] We found similar odds of non-driving, cellular phone, and child-related distractions among parents of 1-year-olds and parents of 8- to 12-year-olds, while odds of engaging in these distractions were higher among parents of 5- to 7-year-olds. Parents of children in the oldest age group may be modeling safer driving behavior as their children approach driving age. Research is needed to understand how parent perspectives of their own driving behavior change as their children age and how children perceive potentially unsafe driving behaviors as they transition from exclusively traveling as passengers to becoming young drivers. Primary care providers may be able to incorporate anticipatory guidance around safe driving when they discuss child safety seat use during well child exams.[32] Discussions about child-related driving distractions may help to identify children who are at risk for inconsistent use of age-appropriate restraints and sitting in the front seat before the recommended age of 13 years.

The associations between potential distracted driving behavior and previously recognized unsafe driving behavior are concerning for the safety of child passengers, especially given prior research demonstrating that, when combined, distractions, speed, and impairment significantly reduce driving performance.[13,14,24] Parents in our study reported more drowsy driving compared with results from a national survey of adult drivers.[33] How the combinations of distractions and unsafe driving behaviors interact to influence the driving performance specifically among drivers of child passengers is not well understood. Naturalistic driving studies, which utilize instrumented vehicles to collect data of driving behavior, represent a rich method for the study of driver distractions during every-day trips with children. One study of twelve families conducted by Koppel et al, found that drivers frequently interacted with child passengers in the rear seat and almost three-quarters of potentially distracting activities occurred while the study vehicle was in motion.[20] Future naturalistic driving studies with a larger sample of families would be needed to determine

the actual number, frequency, duration, and combinations of child-related, technology-related, and driver-related distractions among drivers of child passengers.

Limitations

As with any survey of self-reported behaviors, our results are subject to limitations. First, self-report of driving behaviors may be subject to recall, reporting, and social desirability biases. Specifically, recall bias is most likely for questions that reference impaired and drowsy driving in the past year and may result in an underestimation of the frequency of these behaviors. Social desirability also would bias our results toward underestimating the frequency of driver distractions and other unsafe driving behaviors. While self-reported seat belt use when driving was consistent with overall seat belt use in Michigan (94%),[34] reporting and social desirability biases may be stronger for some behaviors than others based on perceived social norms.[5,35] Parents may be less willing to disclose illegal activities such as impaired driving or text messaging than more commonly reported activities such as eating and talking on a hand-held cellular phone. Parents responding to our survey disclosed talking on cellular phones and text messaging 10 to 15 percentage points less frequently than mothers in a recent online survey.[28] Nevertheless, our results highlight the fact that child passengers are frequently being exposed to the potential risks of distracted driving. Second, the potential driver distractions included in this study present varying degrees of crash risk and do not encompass all possible distractions. We did not assess driver perception of the risks associated with these activities or determine if the activities were performed simultaneously. Each of the ten activities measured has elements of visual, manual, and cognitive distraction; however, this self-report survey cannot determine the extent to which each activity would take a driver's eyes off the road, their hands off the steering wheel, or their mind off the task of driving. Complexity is essential to estimating distraction potential in that more complex tasks are more detrimental to driving performance than lesser-demanding tasks.[1] Third, by defining child restraint use by the least protective restraint, we may overestimate a rare event and acknowledge that the least protective restraint may not be the child's typical restraint. Fourth, there is potential for non-response bias in relation to race/ethnicity as incomplete responses were more common among minority parents. We cannot estimate the direction of this bias. Fifth, the sitting in the front seat and unrestrained questions did not provide a reference timeframe. Finally, results from this sample, consisting primarily of mothers in two Michigan EDs, may not be generalizable to other drivers in other settings.

Conclusion

Young children rely on their parents for not only their transportation needs but also for ensuring their safety. Distracted driving activities among parents are common and the association of distracting activities with other unsafe driving behaviors unnecessarily places child passengers at increased risk of MVCs and subsequent crash-related injury. Efforts to improve child passenger safety have historically focused on increasing use of restraint systems. Our study identifies opportunities for new approaches to improve child passenger safety by preventing crash events through the reduction or elimination of distractions and other unsafe behaviors among drivers of child passengers.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

This research was supported by a grant from the Michigan Center for Advancing Safety Transportation throughout the Lifespan (MCASTL). Dr. Macy received support from the Eunice Kennedy Shriver National Institute of Child Health and Human Development (K23 HD070913). Dr. Cunningham received support from the University of Michigan Injury Center through the Centers for Disease Control and Prevention (R49CE002099).

The authors appreciate the contributions of the research assistants involved in subject recruitment and data collection. The authors are also grateful to the patients and families and the ED staff at both the University of Michigan C.S. Mott Children's Hospital and the Hurley Medical Center who made this research possible.

Abbreviations

AOR	adjusted odds ratio
CI	confidence interval
ED	emergency department
HMC	Hurley Medical Center
IQR	interquartile range
MVC	motor vehicle collision
UM	University of Michigan
U.S	United States

References

1. Klauer, SG.; Dingus, TA.; Neale, VL.; Sudweeks, JD.; Ramsey, DJ. The impact of driver inattention on near-crash/crash risk: an analysis using the 100-car naturalistic driving study data. U.S., Department of Transportation, National Highway Traffic Safety Administration; 2006.
2. Regan MA, Hallett C, Gordon CP. Driver distraction and driver inattention: definition, relationship and taxonomy. Accid Anal Prev. Sep; 2011 43(5):1771–1781. [PubMed: 21658505]
3. Wilson FA, Stimpson JP. Trends in fatalities from distracted driving in the United States, 1999 to 2008. Am J Public Health. Nov; 2010 100(11):2213–2219. [PubMed: 20864709]
4. Robbins A. Distracted driving - it is time for public health to step in. J Public Health Policy. May; 2013 34(2):193–196. [PubMed: 23447027]
5. Lerner BH. Drunk driving, distracted driving, moralism, and public health. N Engl J Med. Sep 8; 2011 365(10):879–881. [PubMed: 21899449]
6. Mobile Device Use While Driving - United States and Seven European Countries, 2011. MMWR Morb Mortal Wkly Rep. Mar 15; 2013 62(10):177–182. [PubMed: 23486382]
7. Hamilton, BC.; Arnold, LS.; Tefft, BC. Distracted and Risk-Prone Drivers. Washington, D.C: AAA Foundation for Traffic Safety; Jan. 2013
8. Madden, M.; Rainie, L. Adults and Cell Phone Distractions. Washington, D.C: Pew Research Center; 2010.
9. Dingus TA, Hanowski RJ, Klauer SG. Estimating Crash Risk. Ergonomics in Design. 2011; 19(4): 8–12.
10. [Accessed July 8, 2013.] Traffic Safety Facts 2011 Data National Highway Traffic Safety Administration DOT HS 811 753. http://www-nrd.nhtsa.dot.gov/Pubs/811753.pdf

11. Tefft BC. Prevalence of motor vehicle crashes involving drowsy drivers, United States, 1999–2008. Accid Anal Prev. Mar.2012 45:180–186. [PubMed: 22269499]
12. Traffic Safety Facts Crash*Stats Drowsy Driving. [Accessed July 8, 2013] National Highway Traffic Safety Administration DOT HS 811 449. http://www-nrd.nhtsa.dot.gov/pubs/811449.pdf
13. Harrison EL, Fillmore MT. Alcohol and distraction interact to impair driving performance. Drug Alcohol Depend. Aug 1; 2011 117(1):31–37. [PubMed: 21277119]
14. Anderson C, Horne JA. Driving drowsy also worsens driver distraction. Sleep Med. May; 2013 14(5):466–468. [PubMed: 23523431]
15. Centers for Disease Control and Prevention. [Accessed March 7, 2013.] Ten Leading Causes of Death and Injury Charts, 2010 Causes of Death By Age Group and Causes of Injury Death: Highlighting Unintentional Injury. Available at: http://www.cdc.gov/injury/wisqars/leadingcauses.html
16. Neyens DM, Boyle LN. The influence of driver distraction on the severity of injuries sustained by teenage drivers and their passengers. Accid Anal Prev. Jan; 2008 40(1):254–259. [PubMed: 18215556]
17. Olsen EO, Shults RA, Eaton DK. Texting While Driving and Other Risky Motor Vehicle Behaviors Among US High School Students. Pediatrics. Jun; 2013 131(6):e1708–1715. [PubMed: 23669511]
18. Klauer SG, Guo F, Simons-Morton BG, Ouimet MC, Lee SE, Dingus TA. Distracted driving and risk of road crashes among novice and experienced drivers. N Engl J Med. Jan 2; 2014 370(1):54–59. [PubMed: 24382065]
19. Roney L, Violano P, Klaus G, Lofthouse R, Dziura J. Distracted driving behaviors of adults while children are in the car. J Trauma Acute Care Surg. May 22.2013
20. Koppel S, Charlton J, Kopinathan C, Taranto D. Are child occupants a significant source of driving distraction? Accid Anal Prev. May; 2011 43(3):1236–1244. [PubMed: 21376923]
21. Koppel S, Muir C, Budd L, et al. Parents' attitudes, knowledge and behaviours relating to safe child occupant travel. Accid Anal Prev. Mar.2013 51:18–26. [PubMed: 23182779]
22. Child passenger deaths involving drinking drivers--United States, 1997–2002. MMWR Morb Mortal Wkly Rep. Feb 6; 2004 53(4):77–79. [PubMed: 14762331]
23. Insurance Institute for Highway Safety. [Accessed July 8, 2013.] Cellphone and texting laws. http://www.iihs.org/laws/cellphonelaws.aspx
24. Johnson MB, Voas RB, Lacey JH, McKnight AS, Lange JE. Living dangerously: driver distraction at high speed. Traffic Inj Prev. Mar; 2004 5(1):1–7. [PubMed: 14754669]
25. Cherpitel CJ, Ye Y, Greenfield TK, Bond J, Kerr WC, Midanik LT. Alcohol-related injury and driving while intoxicated: a risk function analysis of two alcohol-related events in the 2000 and 2005 National Alcohol Surveys. Am J Drug Alcohol Abuse. May; 2010 36(3):168–174. [PubMed: 20465375]
26. [Accessed June 15, 2012.] Michigan Child Passenger Safety Law. 2008. http://www.michigan.gov/msp/0,1607,7-123-1593_3504_22774-113709--,00.html
27. Tison, J.; Chaudhary, N.; Cosgrove, L. National Phone Survey on Distracted Driving Attitudes and Behaviors. U.S., Department of Transportation, National Highway Traffic Safety Administration; 2011.
28. [Accessed June 25, 2013.] Exclusive Survey from American Baby and Safe Kids Worldwide: Moms Make the Same Risky Driving Choices as Teens 2013. http://www.prnewswire.com/news-releases/exclusive-survey-from-american-baby-and-safe-kids-worldwide-moms-make-the-same-risky-driving-choices-as-teens-188037471.html
29. Duggan, M. Cell Phone Activities in 2013. Washinton, D.C: Pew Research Center; Sep 16. 2013
30. Taubman-Ben-Ari O, Katz-Ben-Ami L. The contribution of family climate for road safety and social environment to the reported driving behavior of young drivers. Accid Anal Prev. Jul.2012 47:1–10. [PubMed: 22405232]
31. Taubman-Ben-Ari O, Katz-Ben-Ami L. Family climate for road safety: a new concept and measure. Accid Anal Prev. May.2013 54:1–14. [PubMed: 23500935]
32. Durbin DR. Child Passenger Safety - Policy Statement. Pediatrics. Apr; 2011 127(4):788–793. [PubMed: 21422088]

33. Arnold, LS.; Tefft, BC. 2012 Traffic Safety Culture Index: Motorists Admit to Driving Drowsy. Washington, D.C: AAA Foundation for Traffic Safety; Dec. 2012

34. Datta, TK.; Salvolainen, PT.; Gates, T.; Russo, BJ. 2012 Annual Direct Observation Survey of Seat Belt Use. Prepared by Wayne State University Transportation Research Group for Michigan Office of Highway Safety Planning; 2012.

35. Atchley P, Hadlock C, Lane S. Stuck in the 70s: the role of social norms in distracted driving. Accid Anal Prev. Sep.2012 48:279–284. [PubMed: 22664691]

What's New

Parents disclosed using cellular phones while their 1- to 12-year-old child was a passenger at levels consistent with the U.S. adult population and more than two-thirds disclosed child-related distractions. Driving distractions among parents represent an opportunity for childhood injury prevention.

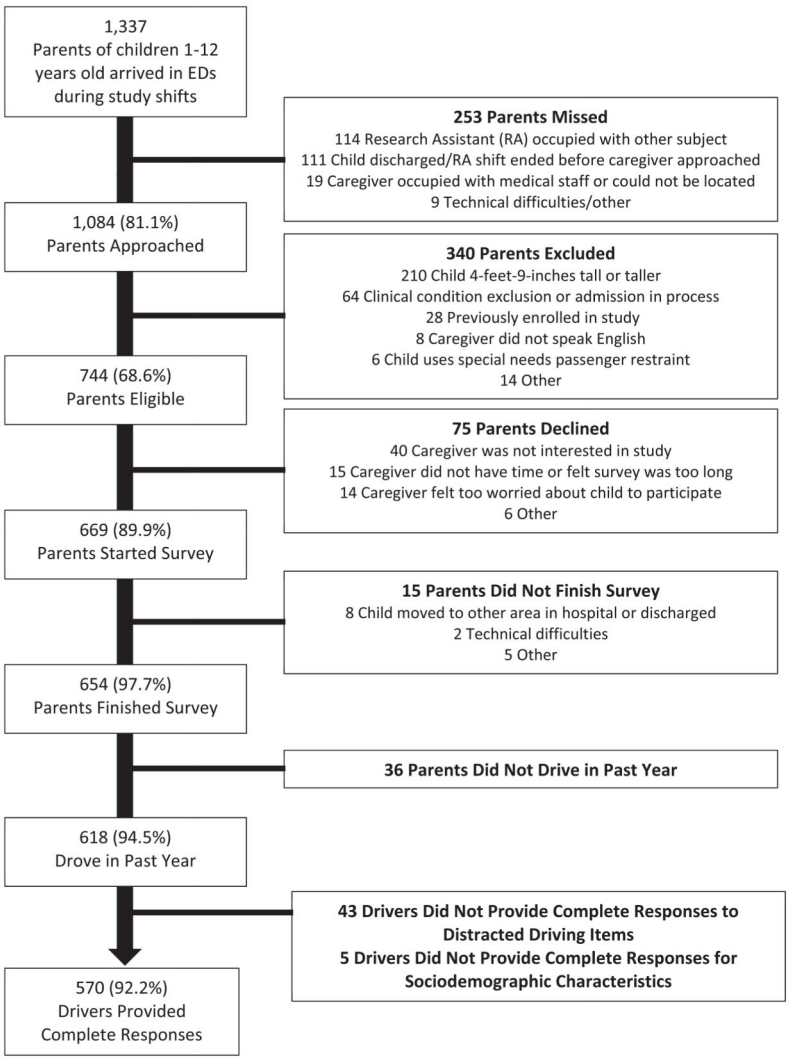

Figure 1.
Subject Flow Diagram.

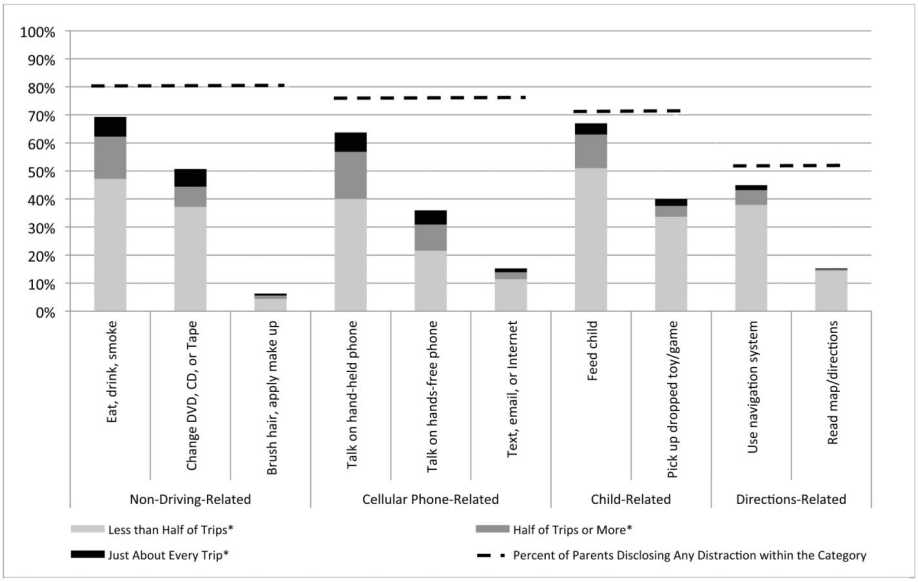

Figure 2. Potentially Distracting Behaviors in the Prior Month Disclosed by Parent Drivers

The height of the bars indicate the percentage of parents disclosing each potentially distracting behavior *in the past month while driving with child in a moving vehicle. The dashed lines indicate the percentage of parents disclosing at least one distraction from within a given category.

Table 1

Sample Characteristics

	Overall N=570
Driver Gender	
Male	20.0%
Relationship to Child	
Mother	76.1%
Father	19.7%
Other	4.2%
Race/Ethnicity	
White, Non-Hispanic	63.0%
Black, Non-Hispanic	23.7%
Hispanic	4.4%
Other, Non-Hispanic	8.9%
Driver Age	
18 to 29 years	27.0%
30 to 39 years	30.3%
40+ years	12.1%
Missing – no response	30.5%
Driver Education Level	
Less than High School	5.6%
High School/GED	34.0%
Associates/Tech	28.6%
Bachelors or Higher	31.8%
Annual Family Income*	
I don't know	4.7%
<$25,000	32.5%
$25,000–49,000	24.2%
$50,000–74,000	13.2%
$75,000–99,000	9.2%
≥$100,000	16.2%
Family Has a Vehicle†	
None	2.3%
One	32.4%
Two	51.4%
Three or more	13.9%
Child Rides in the Family Vehicle	
Every day	77.4%

	Overall N=570
At least once per week, not every day	20.0%
Less than once per week	2.6%
Child Age	
1 year	15.6%
2 to 3 years	26.0%
4 to 5 years	26.3%
6 to 7 years	15.8%
8 to 12 years	16.3%
Child Gender	
Male	54.0%
Reason for Visit	
Injury	22.1%
Study Site	
C.S. Mott Children's Hospital University of Michigan	51.9%

*16 parents did not provide a response for annual family income

†2 parents did not provide a response for number of vehicles at their home

Table 2

Adjusted Odds Ratios of Potential Distractions by Sociodemographic Characteristics

	Distraction Category							
	Non-Driving-Related		Cellular Phone-Related		Child-Related		Directions-Related	
Sociodemographic Characteristics	**AOR***	**95% CI**	**AOR***	**95% CI**	**AOR***	**95% CI**	**AOR***	**95% CI**
Child Age								
1 year	Ref	--	Ref	--	Ref	--	Ref	--
2 to 3 years	1.27	0.69–2.35	1.12	0.61–2.09	**2.26**	**1.27–4.01**	1.63	0.93–2.87
4 to 5 years	**2.47**	**1.25–4.86**	1.46	0.77–2.78	**2.65**	**1.46–4.81**	1.74	0.98–3.11
6 to 7 years	**4.96**	**1.96–12.59**	**2.63**	**1.17–5.89**	**2.53**	**1.28–5.02**	**2.81**	**1.46–5.42**
8 to 12 years	1.38	0.78–3.34	1.31	0.64–2.68	1.41	0.75–2.67	**2.05**	**1.07–3.91**
Child's Travel Frequency								
Less than daily	Ref	--	Ref	--	Ref	--	Ref	--
Every day	1.28	0.78–2.11	**1.75**	**1.10–2.79**	1.43	0.92–2.22	1.24	0.80–1.91
Driver Gender								
Female	Ref	--	Ref	--	Ref	--	Ref	--
Male	1.45	0.78–2.72	1.07	0.61–1.86	0.79	0.49–1.30	1.08	0.68–1.72
Driver Race								
Non-Hispanic, black	Ref	--	Ref	--	Ref	--	Ref	--
Non-Hispanic, white	1.29	0.78–2.13	**1.67**	**1.03–2.70**	**1.77**	**1.13–2.78**	**2.03**	**1.31–3.16**
Other	**3.08**	**1.18–8.02**	1.58	0.76–3.30	1.81	0.89–3.64	**2.42**	**1.24–4.72**
Driver Age								
18 to 29 years	Ref	--	Ref	--	Ref	--	Ref	--
30 to 39 years	0.89	0.48–1.64	1.19	0.65–2.17	1.64	0.95–2.81	0.84	0.51–1.39
40+ years	0.90	0.38–2.11	0.61	0.29–1.28	1.02	0.52–2.03	1.15	0.58–2.25
Missing – no response	0.61	0.35–1.06	0.64	0.38–1.08	1.16	0.71–1.90	0.84	0.52–1.37
Education Level								
High School/GED or Less	Ref	--	Ref	--	Ref	--	Ref	--

	Distraction Category							
	Non-Driving-Related		Cellular Phone-Related		Child-Related		Directions-Related	
Sociodemographic Characteristics	**AOR***	**95% CI**	**AOR***	**95% CI**	**AOR***	**95% CI**	**AOR***	**95% CI**
Associates/Tech	1.24	0.74–2.09	**2.05**	**1.25–3.36**	1.32	0.83–2.10	1.35	0.88–2.08
Bachelors or Higher	1.50	0.85–2.66	**2.65**	**1.52–4.62**	1.41	0.86–2.33	**2.24**	**1.41–3.54**
Site								
HMC	Ref	--	Ref	--	Ref	--	Ref	--
UM	1.52	0.94–2.45	1.35	0.86–2.12	1.29	0.85–1.96	**2.07**	**1.41–3.04**

AOR = Adjusted Odds Ratio *adjusting for other variables presented in the table, CI = Confidence Interval, Ref = reference group, HMC = Hurley Medical Center, UM = C.S. Mott Children's Hospital University of Michigan. Bold text indicates p<0.05.

Table 3

Adjusted* Odds Ratios of Potential Distractions and Unsafe Driving Behaviors

	Distraction Category							
	Non-Driving-Related		Cellular Phone-Related		Child-Related		Directions-Related	
	AOR*	95% CI	AOR*	95% CI	AOR*	95% CI	AOR*	95% CI
Unsafe Driving Behaviors								
Past-year drowsy driving	**5.35**	**2.25–12.73**	**2.89**	**1.50–5.56**	**2.82**	**1.58–5.03**	**2.52**	**1.57–4.05**
Past-year impaired driving	2.40	0.69–8.29	2.92	0.93–9.15	**6.27**	**1.45–27.14**	2.19	0.96–5.01
Ever pulled over for speeding	**2.85**	**1.75–4.65**	**3.63**	**2.27–5.80**	**1.98**	**1.33–2.98**	2.27	0.99–5.21
Prior license suspension	**2.12**	**1.02–4.39**	1.37	0.75–2.52	1.25	0.72–2.17	1.46	0.87–2.43
Restraint Use and Seat Position								
Parent does NOT ALWAYS wear seat belt	1.36	0.87–2.12	1.01	0.67–1.54	1.18	0.80–1.73	1.04	0.73–1.50
Child NEVER uses the age-appropriate restraint	0.58	0.30–1.10	0.64	0.35–1.19	1.11	0.60–2.06	0.81	0.45–1.46
Child does NOT ALWAYS use the age- appropriate restraint	0.89	0.51–1.53	1.05	0.63–1.77	**2.36**	**1.37–4.05**	1.32	0.84–2.09
Child ever sits in front seat	2.38	0.90–6.31	1.19	0.56–2.55	**2.87**	**1.29–6.39**	1.17	0.61–2.26

AOR = Adjusted Odds Ratio *adjusting for driver age, gender, race/ethnicity, education, child age, child's travel frequency, and study recruitment site. CI = Confidence Interval. Bold cells indicate $p<0.05$.