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Trends in teen driver licensure, driving patterns and crash involvement in the United States, 2006–2015☆

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Abstract

Introduction—The Monitoring the Future (MTF) survey provides nationally-representative annual estimates of licensure and driving patterns among U.S. teens. A previous study using MTF data reported substantial declines in the proportion of high school seniors that were licensed to drive and increases in the proportion of nondrivers following the recent U.S. economic recession.

Method—To explore whether licensure and driving patterns among U.S. high school seniors have rebounded in the post-recession years, we analyzed MTF licensure and driving data for the decade of 2006–2015. We also examined trends in teen driver involvement in fatal and nonfatal injury crashes for that decade using data from the Fatality Analysis Reporting System and National Automotive Sampling System General Estimates System, respectively.

Results—During 2006–2015, the proportion of high school seniors that reported having a driver's license declined by 9 percentage points (11%) from 81% to 72% and the proportion that did not drive during an average week increased by 8 percentage points (44%) from 18% to 26%. The annual proportion of black seniors that did not drive was consistently greater than twice the proportion of nondriving white seniors. Overall during the decade, 17- and 18-year-old drivers experienced large declines in fatal and nonfatal injury crashes, although crashes increased in both 2014 and 2015.

Conclusions—The MTF data indicate that licensure and driving patterns among U.S. high school seniors have not rebounded since the economic recession. The recession had marked negative effects on teen employment opportunities, which likely influenced teen driving patterns. Possible explanations for the apparent discrepancies between the MTF data and the 2014 and 2015 increases in crashes are explored.

Practical applications—MTF will continue to be an important resource for clarifying teen driving trends in relation to crash trends and informing strategies to improve teen driver safety.

☆Disclaimer: the findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention/the Agency for Toxic Substances and Disease Registry.

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Keywords

Adolescent; Teenagers; Licensure; Automobile driving; Motor vehicle crashes

1. Introduction

In a 2013 report, Shults and Williams published results of the Monitoring the Future (MTF) surveys showing teen driver licensure and driving trends among 12th grade students in the United States during 1996–2010 (Shults & Williams, 2013). They reported that the proportion of high school seniors that were licensed to drive declined by 12 percentage points from 85% to 73% and the proportion that did not drive during an average week increased by 7 percentage points from 15% to 22% during the 15-year period. Most of the decline in licensure and increase in nondrivers occurred during 2006–2010. The authors concluded that the recent economic recession likely influenced licensure and driving patterns among high school seniors and encouraged use of the MTF data to monitor teen driving patterns as the economy recovered.

The U.S. recession began in December 2007 and officially ended in June 2009, although economic weakness continued for several years (U.S. Bureau of Labor Statistics, 2012). This report updates the MTF licensure and driving data, concentrating on the decade of 2006–2015, and summarizes the trends in teen driver involvement in fatal and nonfatal injury crashes for that decade. This time span allows teen licensure, driving patterns, and crash involvement to be examined before and after the recession.

2. Methods

Monitoring the Future is a self-administered survey completed each spring by U.S. high school students (Miech, Johnston, O'Malley, Bachman, & Schulenberg, 2016). The survey uses a multi-stage sampling procedure to produce a representative sample of seniors in the 48 contiguous states. Students are randomly given one of six survey forms. Some of the survey questions are included on all six forms, whereas others are included on only one form. Students complete the pencil and paper survey during school hours (Bachman, Johnston, & O'Malley, 2014). During 2006–2015, between 13,015 and 15,132 high school seniors attending between 120 and 136 public or private schools completed the survey. Response rates, measured as the quotient of the attained sample divided by the number of enrolled students provided by schools, ranged from 79% to 85% (Miech et al., 2016). Throughout the decade, approximately 95% of respondents were either 17 or 18 years old (personal communication, Timothy Perry, 2017). Further details about the survey methods and limitations are available elsewhere (Bachman et al., 2014; Miech et al., 2016).

For this report, 2006–2012 MTF data were accessed from the annual reference volumes at http://monitoringthefuture.org/pubs.html#refvols, and 2013–2015 data were provided by MTF staff (personal communication, Timothy Perry, 2016). The licensure question read, "Do you have a driver's license?" The question was included in only one of six forms, and therefore, responses were based on annual sample sizes of 1980 to 2356. The driving question read, "During an average week, how much do you usually drive a car, truck, or

motorcycle?" This question was included on all six questionnaire forms and responses were based on annual sample sizes ranging from 11,998 to 14,089. Results reported by race include only students who identified as "Black or African American" or "White (Caucasian)," which consistently represented approximately 81% of all respondents. All other analyses include students of all reported races and ethnicities. Confidence intervals for the proportions and p-values for differences in proportions were estimated using the method described in Appendix A of the 2012 MTF reference volume (Bachman et al., 2014).

Data on 17- and 18-year-old drivers who were involved in a fatal or nonfatal injury crash during 2006–2015 were obtained from the Fatality Analysis Reporting System (FARS) and the National Automotive Sampling System General Estimates System (GES), respectively. Both surveillance systems are maintained by the National Highway Traffic Safety Administration (NHTSA, 2016a). FARS is a census of fatal traffic crashes occurring on public roads in the U.S. FARS defines a fatal crash as one in which at least one vehicle occupant or nonoccupant (e.g., bicyclist or pedestrian) involved in the crash died within 30 days of the crash (NHTSA, 2016b). GES contains a nationally representative sample of approximately 60,000 crashes selected from the >5 million annual police reported crashes involving property damage, injury, or death. GES records the injury status of occupants and nonoccupants based on the crash incident police report (NHTSA, 2016b). We restricted analyses to drivers of passenger vehicles (i.e., cars, sport utility vehicles, pickup trucks, and vans).

3. Results

3.1. Monitoring the future licensure and driving trends

During 2006–2015, the proportion of high school seniors that reported having a driver's license declined by 9 percentage points (11%) from 81% to 72% (Table 1). Licensure among black seniors was consistently lower compared with white seniors and did not decline significantly over the decade, whereas declines were statistically significant for the total population, males, females, and white seniors.

The proportion of high school seniors that did not drive during an average week increased over the decade by 8 percentage points (44%) from 18% to 26% (Table 2). As with licensure, the proportion of nondrivers varied by both gender and race, with proportions of nondrivers nearly always significantly higher among females and blacks compared with males and whites, respectively (Table 2). The annual proportion of black seniors that did not drive was consistently greater than twice the proportion of nondriving white seniors. In 2015, 4 in 10 (41%) black seniors did not drive during an average week.

3.2. Teen driver fatal and nonfatal injury crash involvement

Trends in fatal and nonfatal injury crash (injury crash) involvement were similar for drivers aged 17 and 18 years, although 18-year-olds were consistently involved in more crashes than 17-year-olds (Figs. 1 and 2). Fatal crash involvement declined steadily through 2013 for both ages, with reductions of 58% for 17-year-olds and 50% for 18-year-olds, and increased during both 2014 and 2015. Injury crash involvement declined most rapidly between 2006

and 2009 for both ages, with reductions of 35% for 17-year-olds and 28% for 18-year-olds. Injury crash involvement reached lows for both ages in 2013 and increased during 2014 and 2015. Overall during the decade of 2006–2015, 17-year-old drivers experienced a 50% decline in fatal crash involvement and 26% decline in injury crash involvement. Likewise, 18-year-old drivers experienced a 45% decline in fatal crash involvement and 25% decline in injury crash involvement.

4. Discussion

During the decade of 2006–2015, the proportion of U.S. high school seniors that had a driver's license decreased substantially and the proportion that did not drive in an average week increased substantially. Neither licensure nor driving patterns in this population has rebounded in the post-recession years.

The U.S. economic recession had disproportionate and lingering negative effects on teen employment opportunities (Fogg, Harrington, & Khatiwada, 2016; Soergel, 2015), which likely influenced teen driving patterns (Highway Loss Data Institute, 2015). The proportion of 16–19-year-olds who were employed declined from a pre-recession level of 37% in January 2006 to 25% in June 2010, a full year after the official end of the recession (U.S. Bureau of Labor Statistics, 2017). The proportion of teens employed remained at its low through February 2014, when a slow rebound began. By December 2015, the proportion of 16–19-year-olds who were employed had increased to 30%.

Employment trend data from Monitoring the Future echo the U.S. Bureau of Labor Statistics. The proportion of high school seniors that had no earned income increased from a pre-recession level of 32% in 2006, reaching a high of 47% in 2010 and remaining at ≥43% through 2015 (http://monitoringthefuture.org/pubs.html#refvols and personal communication, Timothy Perry, 2017). A recent MTF study reported that high school seniors who did not have an income-earning job were 2.8 times more likely to be nondrivers as those earning an average of ≥$36 per week (Shults, Banerjee, & Perry, 2016). Taken together, these findings suggest that the post-recession declines in the employment opportunities for teens help to explain the concurrent declining trend in driving among high school seniors.

Several factors may help explain the apparent discrepancies between the continued decline in the proportion of teen drivers during 2014 and 2015 and the increase in fatal crash involvement. The populations differ in that all 17- and 18-year-olds involved in crashes were represented in the crash data but only those 17- and 18-year-olds who were attending high school were represented in the MTF data. In 2015, 7% of 17-year-olds and 25% o 18-year-olds were not enrolled in high school (U.S. Census Bureau, 2017). Another possible explanation is that the teens who drove during 2014 and 2015 were driving more miles or under riskier conditions than their counterparts in years past. These possible explanations, however, cannot be explored with existing data.

Several limitations warrant consideration when interpreting the study findings. MTF does not assess reasons why students might choose not to drive, such as perceived need to drive

and availability of alternate modes of transportation. According to 2012 MTF data, black respondents were about three times as likely as their white counterparts to have grown up in cities with populations of ≥100,000 (29% vs. 9%, respectively) (Bachman et al., 2014), where public transportation might be more accessible. Because the survey is conducted among high school seniors, the results may not be representative of 17- and 18-year-olds who are not enrolled in high school. Although the surveys' annual response rates were ≥79%, nonresponse bias is still possible. Lastly, the unweighted number of injury crashes among 17- and 18-year-old drivers in the 2013 GES sample (N = 1376) was smaller compared with numbers from the other nine study years (range 1966 to 3183), likely resulting in less precise estimates of injury crash involvement in 2013 compared with other years.

The Monitoring the Future survey provides the only reliable, nationally-representative, annual estimates of licensure and driving patterns among U.S. teens. The other source of annual data on licensing rates by age published by the Federal Highway Administration is not accurate enough for research purposes (Curry, Kim, & Pfeiffer, 2014; Foss, 2014). No nationally-representative, annual source of teen driving exposure data exists. MTF will continue to be an important resource for clarifying teen driving trends in relation to crash trends and informing strategies to improve teen driver safety. The data could also inform the need for approaches to provide safe, affordable transportation options for teens who do not drive, especially for those who may face economic barriers to driving.

Although cross-sectional studies such at the MTF provide useful information about population trends, they are inadequate for fully understanding if, when, and how young people learn to drive. Longitudinal study designs that periodically survey cohorts of teens as they age into early adulthood and link to license and driving violations data could greatly improve our understanding of how young people learn to drive and the benefits and risks involved.

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Allan F. Williams has a PhD in Social Psychology from Harvard University. He has conducted research on highway safety issues for more than 40 years, with special emphasis on adolescents. He has conducted extensive research on adolescent driving issues, including several studies addressing trends in crash rates and explanations for these trends. He retired from the Insurance Institute for Highway Safety as Chief Scientist in 2004, and has since worked as a highway safety consultant.

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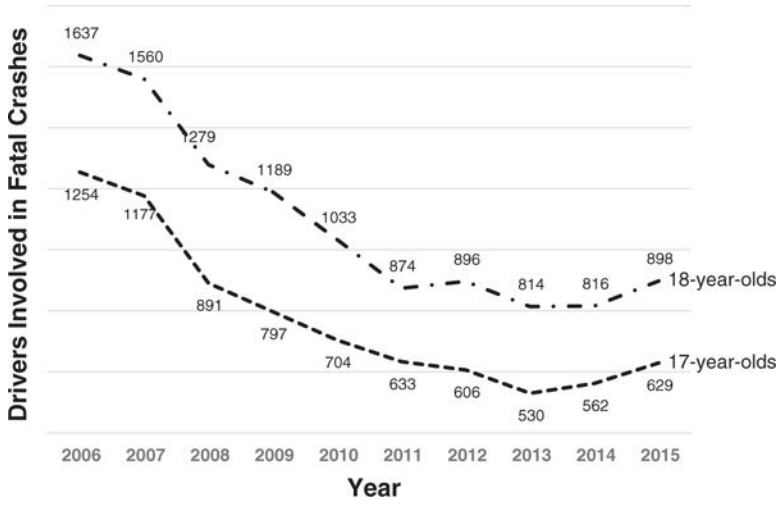

Fig. 1.
Number of 17- and 18-year-old U.S. drivers involved in fatal crashes, 2006–2015.

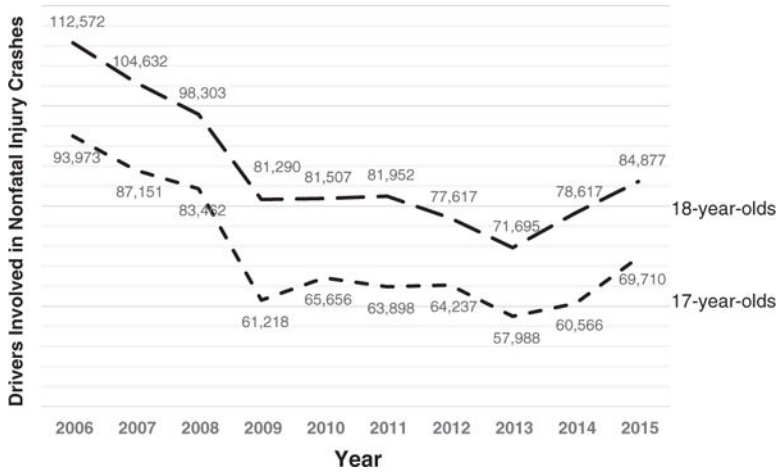

Fig. 2.

Estimated number of 17- and 18-year-old U.S. drivers involved in nonfatal injury crashes, 2006–2015.

Table 1

Proportion of U.S. high school seniors that had a driver's license, by gender and race, Monitoring the Future, 2006–2015.

	Total %(95% CI)[a]	Male %(95% CI)	Female %(95% CI)	White %(95% CI)	Black %(95% CI)
Year					
2006	81 (78, 83)	85 (82, 87)	77 (74, 79)	89 (87, 90)	68 (59, 75)
2007	77 (75, 80)	82 (78, 84)	74 (70, 77)	86 (84, 89)	60 (52, 68)
2008	78 (76, 80)	83 (80, 86)	74 (70, 77)	88 (86, 90)	57 (50, 64)
2009	75 (72, 77)	80 (77, 83)	70 (66, 73)	84 (82, 86)	65 (56, 72)
2010	73 (71, 75)	78 (75, 81)	68 (65, 72)	84 (82, 86)	61 (54, 67)
2011	72 (70, 74)	75 (72, 78)	70 (67, 73)	83 (80, 85)	57 (50, 64)
2012	75 (73, 77)	79 (76, 82)	71 (68, 74)	85 (83, 87)	62 (55, 68)
2013	73 (70, 76)	75 (72, 78)	72 (69, 75)	85 (83, 87)	61 (53, 68)
2014	73 (70, 76)	75 (72, 78)	71 (68, 74)	85 (83, 87)	57 (50, 64)
2015	72 (69, 75)	75 (72, 78)	69 (66, 72)	82 (79, 85)	65 (58, 71)

[a]95% CI: confidence interval.

Table 2

Proportion of U.S. high school seniors that did not drive during an average week, by gender and race, Monitoring the Future, 2006–2015.

	Total % (95% CI)[a]	Male %(95% CI)	Female %(95% CI)	White %(95% CI)	Black %(95% CI)
Year					
2006	18 (16, 19)	15 (13, 16)	20 (19, 22)	11 (10, 12)	30 (26, 33)
2007	20 (19, 22)	17 (15, 18)	23 (22, 25)	12 (11, 13)	37 (34, 41)
2008	21 (20, 22)	17 (16, 19)	24 (23, 26)	13 (11, 14)	36 (32, 39)
2009	22 (20, 23)	18 (16, 19)	25 (24, 26)	14 (12, 15)	34 (30, 39)
2010	22 (21, 24)	18 (17, 20)	26 (24, 28)	14 (13, 15)	37 (33, 41)
2011	24 (23, 25)	21 (20, 23)	26 (24, 28)	15 (14, 16)	38 (53, 41)
2012	23 (22, 24)	20 (19, 22)	25 (23, 27)	15 (14, 16)	39 (35, 43)
2013	22 (21, 23)	20 (19, 22)	24 (23, 26)	13 (12, 14)	40 (36, 44)
2014	25 (24, 26)	22 (21, 24)	27 (25, 29)	14 (13, 15)	41 (37, 45)
2015	26 (25, 27)	23 (22, 25)	28 (26, 30)	15 (14, 16)	41 (37, 45)

[a]95% CI: confidence interval.