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U.S. Adolescent Street Racing and Other Risky Driving Behaviors

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Abstract

Purpose: We examined demographic characteristics and risky driving behaviors associated with street racing among adolescents in the NEXT Generation Health Study (N = 2,395).

Method: Binomial logistic regression tested associations between demographics and driving in a street race (DSR) or being a passenger in a street race (PSR). Sequential logistic regression tested the robustness of the association between DSR and crashes.

Results: Hispanic/Latino, non-Hispanic Black/African-American, and mixed-race participants were more likely to engage in DSR. Males were more likely and teens with moderate socioeconomic status were less likely to engage in DSR and PSR. DSR was associated with other risky driving behaviors in bivariate models but was not independently associated with crashes after sequential modeling.

Conclusions: Among adolescents, those who are male, racial/ethnic minorities, or low socioeconomic status may be at higher risk of DSR. However, overall driving risk might explain the association between DSR engagement and higher crash risk.

Keywords

Street racing; Risky driving; Young drivers; Adolescents

Street racing is portrayed as an iconic American pastime, at least in movies, but is a serious international road safety concern. It is mostly considered a planned event in locations with little traffic or where the road is blocked off, often with spectators. It can also occur spontaneously when two drivers pull up beside each other and decide to race [1].

Despite cross-sectional and retrospective associations with crashes [2–4], traffic violations [4], driving while intoxicated [3], and risk appraisal [5], street racing has been a largely neglected topic of research [3,6]. Notably, there is a paucity of research on prevalence,

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predictors, and its covariation with other risky driving behaviors among young, inexperienced drivers.

In this exploratory study, we assessed demographic characteristics associated with teens driving in a street race (DSR) or being a passenger in a street race (PSR) since not much is known about who is at risk of either activity. We examined cross-sectional associations between street racing and other risky driving measures. We also tested the robustness of the cross-sectional association between DSR and crashes.

Methods

Data source

We analyzed data from Wave 3 (W3; N = 2,395) of the NEXT Generation Health Study, an annual, self-report survey of a nationally representative cohort that started with 10th grade students during the 2009–2010 academic year. In W3, participants (mean age = 18.17 years, SE = .03 years) were surveyed online during the 2011–2012 academic year. The sampling method has been described elsewhere [7]. Parental consent and participant assent were obtained at recruitment, and participant consent was obtained after they turned 18 years old. The study was approved by the Institutional Review Board of the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development.

Driving measures

DSR, PSR, and crashes were measured by separate items asking how often each occurred in the past 12 months (*0, 1,* or *2 or more times*). Responses for each measure were dichotomized (any vs. none). The items measuring driving frequency, Checkpoints Risky Driving Scale (C-RDS), and texting/calling while driving asked on how many days in the past 30 days a behavior occurred and were open-response items. Responses greater than 30 were recoded as 30.

The C-RDS measure had 21 items asking how often certain driving behaviors occurred (e.g., speeding, tailgating, weaving through traffic) [8]. C-RDS captures the overall riskiness of a teen driver, and its reliability and validity were confirmed by objective measures in a naturalistic driving study [9]. We excluded two items: street racing (redundancy with other measure) and driving while intoxicated (DWI), which we analyzed separately. We summed the remaining 19 items. Because of the highly skewed distribution, we dichotomized via median split (higher risk vs. lower risk). DWI was dichotomized such that zero days was no DWI and more than zero days was any DWI.

Texting/calling while driving was measured with four items asking how often participants did the following: reading a text, sending a text, answering a call, and making a call. We summed the responses. Because of the highly skewed distribution, we dichotomized via median split (more frequently vs. less frequently).

Demographics

Participants reported their age, gender, and racial/ethnic background. The parent who provided consent also provided the higher education level of both parents. From the

participant report, we estimated family socioeconomic status (SES) using the Family Affluence Scale [10]. Racial/ethnic background was categorized as non-Hispanic White, Hispanic/Latino, non-Hispanic Black/African-American, non-Hispanic mixed race, or other non-Hispanic minorities. Participants who reported having a driver's license in W1 or W2 and were missing a W3 response were considered licensed. If they reported having a license in W3, they were licensed. If they reported having a permit or no license/permit in W3, they were not licensed.

Analysis

All analyses were done in SAS 9.4 and accounted for complex survey design. We first tested bivariate associations between demographics and DSR and between other risky driving behaviors and DSR. Then, demographics associated ($p < .05$) with DSR were analyzed together in a multivariate model. The same process was done with PSR.

When examining DSR and crashes, we started with DSR as the only independent variable while controlling for demographics associated with DSR. We added other behaviors as independent variables in the following order: DWI, C-RDS, texting/calling while driving.

Results

Table 1 shows distributions of participant characteristics and risky driving behaviors and the binary odds of street racing by demographics. About 13.3% of respondents reported engaging in DSR, and 8.4% reported engaging in PSR. In bivariate models, DSR and PSR were associated with crashes, DWI, C-RDS, and texting/calling while driving. In multivariate analysis, male, Hispanic/Latino, non-Hispanic Black/African-American, and mixed-race participants were more likely than their respective reference groups to engage in DSR; those with moderate affluence were less likely than low affluent participants to engage in DSR. In multivariate analysis, males were more likely to engage in PSR while moderately affluent participants were less likely. The median of C-RDS was 38 (n = 8), whereas the median of texting/calling while driving was 14 (n = 10).

Table 2 shows sequential regression models with crashes as the outcome. In Model 1, DSR was positively associated with crashing, but it was not associated after adding DWI in Model 2. In the final adjusted model, only C-RDS and mixed-race identity were positively associated with crashes.

Discussion

Although prevalence of PSR (8.4%) and DSR (13.3%) was modest, males and those with low SES had elevated odds of PSR, whereas DSR was more likely among males, racial/ethnic minorities, and those from low SES families. Consistent with past studies [2–4], DSR was associated with other risky driving behaviors. However, in sequential modeling, C-RDS, not DSR, was associated with crashes. Therefore, overall driving risk might have explained the cross-sectional association between DSR and crash risk, indicating DSR may be just one of several related measures of driving risk, as suggested in a study on self-appraisal of risk

[5]. Prospective studies might further clarify this and the possible roles of SES and racial/ethnic identity on teen street racing.

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IMPLICATIONS AND CONTRIBUTION

About 13% of a sample of U.S. adolescents reported driving in a street race, which was more likely among males, certain racial/ethnic minorities, and those from families with lower socioeconomic status. Street racers were more likely to engage in other risky driving behaviors.

Table 1

Participant demographics, prevalence of DSR and PSR, and prevalence of other risky driving behaviors

					Bivariate regression estimates				Multivariate regression estimates			
		Sample statistics			DSR (Ref = no DSR)		PSR(Ref= no PSR)		DSR (Ref = no DSR)[a]		PSR (Ref = no PSR)	
Characteristics	Category	n	%	95% CI (%)	OR	95% CI	OR	95% CI	AOR	95% CI	AOR	95% CI
Age	<18 years old	933	33.64	(27.73, 39.64)	(Ref)	(Ref)	(Ref)	(Ref)	—	—	—	—
	≥18 years old	1,462	66.36	(60.44, 72.29)	.94	(.53,1.67)	.92	(.62, 1.35)	—	—	—	—
Gender	Female	1,330	55.26	(51.91, 58.61)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)
	Male	1,065	44.74	(41.39, 48.09)	**3.03*****	**(1.92,4.77)**	**1.82****	**(1.17, 2.83)**	**3.39*****	**(2.27, 5.08)**	**1.85****	**(1.20, 2.85)**
Race/ethnicity	Non-Hispanic White	976	58.62	(46.12,71.12)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)	—	—
	Hispanic/Latino	697	19.85	(11.79, 27.90)	**2.94*****	**(1.69, 5.11)**	.66	(.33, 1.33)	**1.97***	**(1.07, 3.64)**	—	—
	Non-Hispanic Black/African-American	538	14.98	(6.80, 23.16)	**1.77***	**(1.07, 2.93)**	1.58	(.91, 2.75)	**2.07***	**(1.09, 3.93)**	—	—
	Non-Hispanic mixed race	88	4.37	(2.51, 6.23)	**3.19**$^{\#}$	**(.91, 11.21)**	.75	(.19, 2.93)	**3.62***	**(1.05, 12.47)**		
	Other non-Hispanic minorities	89	2.18	(.94, 3.42)	**2.93**$^{\#}$	**(.89, 9.66)**	.70	(.19, 2.61)	2.27	(.73, 7.04)	—	—
Socioeconomic Status	Low affluence	764	23.11	(16.75, 29.47)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)
	Moderate affluence	1,125	49.00	(45.95, 52.05)	**.46****	**(.28, .77)**	**.49*****	**(.33, .74)**	**.60***	**(.38, .95)**	**.48*****	**(.32, .71)**
	High affluence	505	27.89	(22.08, 33.70)	.51	(.20, 1.26)	.57	(.29,1.13)	.78	(.33,1.87)	.59	(.30, 1.16)
Highest parental	High school diploma/GED or less	816	31.04	(24.78, 37.29)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)	(Ref)	—	—
education level	Some college education or associate's degree	819	40.57	(36.44, 44.71)	**.52***	**(.28, .97)**	.93	(.53,1.64)	**.64**$^{\#}$	**(.37, 1.09)**	—	—
	Bachelor's degree or more	560	28.39	(21.96,34.81)	**.47***	**(.22, .98)**	.68	(.33,1.41)	**.52**$^{\#}$	**(.27, 1.00)**	—	—
Driving licensure	Not independently licensed	1,159	33.69	(25.42, 41.96)	(Ref)	(Ref)	(Ref)	(Ref)	—	—	—	—
status	Independently licensed	1,223	66.31	(58.04, 74.58)	1.17	(.56, 2.45)	.99	(.62,1.58)	—	—	—	—
Crash involvement	No crashes	2,089	85.59	(82.00, 89.18)	(Ref)	(Ref)	(Ref)	(Ref)				
	Any crashes	295	14.41	(10.82, 18.00)	**1.79***	**(1.05, 3.05)**	**2.46*****	**(1.66, 3.63)**				
DWI	No DWI	1,374	86.95	(54.17, 65.57)	(Ref)	(Ref)	(Ref)	(Ref)				
	Any DWI	159	13.05	(34.43, 45.83)	**3.81*****	**(2.66, 5.44)**	**4.82*****	**(3.01, 7.70)**				
C-RDS[b]	Lower risk driver	1,623	57.06	(50.74, 63.37)	(Ref)	(Ref)	(Ref)	(Ref)				
	Higher risk driver	764	42.94	(36.63, 49.26)	**2.25*****	**(1.50, 3.39)**	**2.03****	(1.29, 3.17)				
Texting/calling whiledriving[c]	Less frequently	1,623	57.18	(51.27, 63.09)	(Ref)	(Ref)	(Ref)	(Ref)				

		Sample statistics			Bivariate regression estimates				Multivariate regression estimates	
					DSR (Ref = no DSR)		PSR(Ref= no PSR)		DSR (Ref = no DSR)[a]	PSR (Ref = no PSR)
	More frequently	762	42.82	(36.91, 48.73)	**1.62** *	**(1.01, 2.59)**	**2.11** **	**(1.27, 3.50)**		
DSR	No DSR	1,350	86.66	(84.20, 89.11)	—	—	(Ref)	(Ref)		
	Any DSR	194	13.34	(10.89, 15.80)	—	—	**13.47** ***	**(7.41, 24.49)**		
PSR	No PSR	2,196	91.65	(89.83, 93.47)	(Ref)	(Ref)	—	—		
	Any PSR	190	8.35	(6.53,10.17)	**13.47** ***	**(7.41, 24.49)**	—	—		

Values in bold indicate $p < .10$.

Binomial logistic regression models testing association of demographics on street racing variables. Descriptive statistics and regression models accounted for complex survey design.

Multivariate regression models only included demographic variables that had at least one group significantly ($p < .05$) associated with DSR/PSR in a bivariate model.

AOR = adjusted odds ratio; CI = confidence interval; C-RDS = Checkpoints Risky Driving Scale; DSR = driving in a street race in the past 12 months; DWI = driving while intoxicated; GED = general equivalency diploma; OR = odds ratio; PSR = being a passenger in a street race in the past 12 months.

[a] Also controlled for frequency of driving in past 30 days.

[b] Standardized Cronbach's α = .92.

[c] Standardized Cronbach's α = .93.

# $p < .10$;

* $p < .05$;

** $p < .01$;

*** $p < .001$.

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Table 2

Binomial logistic regression models with crashes as the outcome and DSR, DWI, C-RDS, and texting/calling while driving as independent variables added in sequence

		Crash involvement (Ref = no crashes)							
		Model 1(n = 1,411)		Model 2 (n = 1,400)		Model 3 (n = 1,394)		Model 4 (n = 1,386)	
		AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Gender	Female (Ref)	—	—	_	—	—	—	—	—
	Male	.84	(.52, 1.35)	.83	(.53, 1.30)	.86	(.54, 1.36)	.86	(.55, 1.36)
Race/ethnicity	Non-Hispanic White (Ref)	—	—	—	—	—	—	—	—
	Hispanic/Latino	.74	(.34, 1.60)	.72	(.32, 1.62)	.77	(.34, 1.75)	.75	(.32, 1.73)
	Non-Hispanic Black/African-American	.89	(.48, 1.67)	.90	(.49, 1.66)	.92	(.49, 1.71)	.92	(.49,1.71)
	Non-Hispanic mixed race	**2.89** **	**(1.42, 5.86)**	**2.99** ***	**(1.61, 5.57)**	**2.95** **	**(1.45, 5.99)**	**2.89** **	**(1.45, 5.77)**
	Other non-Hispanic minorities	1.16	(.29, 4.69)	1.14	(.31, 4.25)	1.16	(.30, 4.43)	1.13	(.30, 4.26)
Socioeconomic	Low affluence (Ref)	—	—	—	—	—	—	—	—
Status	Moderate affluence	1.37	(.70, 2.68)	1.32	(.68, 2.58)	1.22	(.64, 2.31)	1.19	(.62, 2.27)
	High affluence	1.52	(.78, 2.97)	1.50	(.76, 2.94)	1.43	(.71, 2.89)	1.36	(.66, 2.78)
Highest parental	High school diploma/GED or less (Ref)	—	—	—	—	—	—	—	—
education level	Some college education or associate's degree	.95	(.55, 1.65)	.93	(.53, 1.61)	.93	(.52, 1.65)	.91	(.51, 1.62)
	Bachelor's degree or more	.76	(.37,1.55)	.70	(.34, 1.44)	.71	(.34, 1.46)	.70	(.34, 1.46)
Frequency of driving	—	**1.02** #	**(1.00,1.05)**	1.02	(.99, 1.05)	1.00	(.97, 1.03)	1.00	(.97, 1.03)
DSR	No DSR (Ref)	—	—	—	—	—	—	—	—
	Any DSR	**1.74** *	**(1.06, 2.85)**	1.52	(.80, 2.87)	1.35	(.68, 2.65)	1.34	(.70, 2.59)
DWI	No DWI (Ref)	—	—	—	—	—	—	—	—
	Any DWI	—	—	**2.06** #	**(1.00, 4.25)**	1.74	(.83, 3.68)	1.65	(.81, 3.40)
C-RDS	Lower risk driver (Ref)	—	—	—	—	—	—	—	—
	Higher risk driver	—	—	—	—	**2.10** **	**(1.25, 3.55)**	**1.86** *	**(1.14, 3.04)**
Texting/calling	Less frequently (Ref)	—	—	—	—	—	—	—	—
while driving	More frequently	—	—	—	—	—	—	1.36	(.86, 2.15)
χ^2		**85.77** ***		**85.56** ***		**120.64** ***		**150.28** ***	
df		11		12		13		14	

Values in bold indicate $p < .10$.

AOR = adjusted odds ratio; CI = confidence interval; C-RDS = Checkpoints Risky Driving Scale; df = degrees of freedom; DSR = driving in a street race in the past 12 months; DWI = driving while intoxicated; GED = general equivalency diploma; χ^2 = Wald chi-square statistic.

Each model accounted for complex survey design.

The frequency of driving was the number of days driving in the past 30 days. Sample size values (n) refer to the total sample size analyzed by the models.

# $p < .10$;

*$p < .05$;

**$p < .01$;

***$p < .001$.