



Full length article

Childhood weight status and timing of first substance use in an ethnically diverse sample

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ABSTRACT

Background: We examined associations between weight status during childhood and timing of first cigarette, alcohol, and marijuana use in an ethnically diverse sample.

Methods: Data were drawn from child respondents of the 1979 National Longitudinal Survey of Youth, including 1448 Hispanic, 2126 non-Hispanic Black, and 3304 non-Hispanic, non-Black (White) respondents aged 10 years and older as of last assessment. Cox proportional hazards regression was conducted predicting age at first use from weight status (obese, overweight, and underweight relative to healthy weight) assessed at ages 7/8, separately by substance class, sex, and race/ethnicity. Tests of interactions between weight status and respondent sex and race/ethnicity were also conducted.

Results: Compared to healthy-weight females of the same race/ethnicity, overweight Hispanic females were at increased likelihood of alcohol and marijuana use and overweight White females were at increased likelihood of cigarette and marijuana use. Compared to healthy-weight males of the same race/ethnicity, obese White males were at decreased likelihood of cigarette and alcohol use and underweight Hispanic and Black males were at decreased likelihood of alcohol and marijuana use. Significant differences in associations by sex and race/ethnicity were observed in tests of interactions.

Conclusions: Findings highlight childhood weight status as a predictor of timing of first substance use among Hispanic and Non-Hispanic Black and White female and male youth. Results suggest that collapsing across sex and race/ethnicity, a common practice in prior research, may obscure important within-group patterns of associations and thus may be of limited utility for informing preventive and early intervention efforts.

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1. Introduction

According to recent data (Johnston et al., 2015), approximately 14% of 8th graders (ages 13–14 on average) smoked a cigarette, 27% consumed alcohol, and 16% used marijuana at some point in their lives. Although substance use is increasingly normative over the course of adolescence, consequences of early-onset use are far-reaching. Early drinking and drug use are associated with increased risk of accidental falls, burns, and drownings (Bass et al., 1985; Spirito et al., 1997), physical fighting (Dukarm et al., 1996; Hingson et al., 2001), and risky sexual activities (Tapert et al., 2001). Among longer term consequences, early drinking and drug use are predictive of later problem use, including elevated risk of substance

dependence (Grant and Dawson, 1997; Hingson et al., 2006; Robins and Przybeck, 1985).

Identifying predictors of early-onset substance use is critical to inform preventive efforts. However, much literature on predictors of early use predates more recent attention to the obesity epidemic in the U.S. (Ogden et al., 2014), ignoring weight status as a potential risk-factor. This is especially true of research on racial/ethnic minorities, whose rates of smoking, drinking, and marijuana use during adolescence are fast approaching or have surpassed those of Whites (Johnston et al., 2014) and for whom prevalence of obesity is comparatively high. Indeed, current estimates suggest that 22% of Hispanic and 20% of non-Hispanic Black children meet criteria for obesity, relative to 14% of non-Hispanic White children (Ogden et al., 2014).

Although associations between concurrently assessed obesity and use of cigarettes, alcohol, and marijuana are reported in adolescent samples (e.g., Farhat et al., 2010; Fonseca et al., 2009; Ratcliff

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Table 1
Sample characteristics, by offspring sex and race/ethnicity.

	Female			Male		
	Hispanic n = 689	Black n = 1079	White n = 1637	Hispanic n = 759	Black n = 1047	White n = 1667
Age at last interview, <i>M</i> (<i>SD</i>)	22.23 (5.44)	23.17 (5.26)	20.88 (5.67)	22.39 (5.19)	22.79 (5.38)	20.75 (5.59)
Substance use						
Alcohol use, <i>n</i> (%)	570 (82.7)	892 (82.7)	1248 (76.2)	644 (84.9)	857 (81.9)	1271 (76.3)
Age at onset, <i>M</i> (<i>SD</i>)	14.32 (3.36)	14.70 (4.09)	13.90 (3.39)	13.65 (3.46)	13.89 (4.15)	13.33 (3.82)
Cigarette use, <i>n</i> (%)	381 (55.3)	504 (46.7)	845 (51.6)	503 (66.3)	621 (59.3)	919 (55.1)
Age at onset, <i>M</i> (<i>SD</i>)	14.13 (3.47)	14.05 (4.40)	13.36 (3.44)	13.87 (3.97)	13.75 (4.05)	13.42 (3.87)
Marijuana use, <i>n</i> (%)	331 (48.0)	420 (38.9)	645 (39.4)	484 (63.8)	600 (57.3)	790 (47.4)
Age at onset, <i>M</i> (<i>SD</i>)	15.04 (2.85)	15.80 (3.15)	15.29 (2.57)	14.65 (3.02)	14.90 (3.23)	15.18 (2.80)
Childhood weight status, <i>n</i> (%)						
Obese	108 (15.7)	223 (20.7)	176 (10.8)	138 (18.2)	181 (17.3)	235 (14.1)
Overweight	101 (14.7)	138 (12.8)	219 (13.4)	97 (12.8)	149 (14.2)	222 (13.3)
Healthy weight	402 (58.4)	600 (55.6)	1074 (65.6)	434 (57.2)	623 (59.5)	1042 (62.5)
Underweight	78 (11.3)	118 (10.9)	168 (10.3)	90 (11.9)	94 (9.0)	168 (10.1)
Control variables						
Maternal education, <i>n</i> (%)						
Less than high school	296 (43.2)	340 (31.6)	307 (18.8)	322 (42.7)	321 (31.7)	318 (19.1)
High school only	188 (27.4)	351 (32.6)	619 (38.0)	243 (32.2)	355 (34.0)	611 (36.8)
Some college	202 (29.5)	386 (35.8)	705 (43.2)	189 (25.1)	369 (35.3)	733 (44.1)
Maternal age at first birth, <i>n</i> (%)						
19 and younger	316 (45.9)	568 (52.6)	399 (24.4)	322 (42.4)	543 (51.9)	405 (24.3)
20–34	362 (52.5)	506 (46.9)	1194 (72.9)	430 (56.7)	488 (46.6)	1229 (73.7)
34 and older	11 (1.6)	5 (0.5)	44 (2.7)	7 (0.9)	16 (1.5)	33 (2.0)
Childhood family structure, <i>n</i> (%)						
One parent	261 (37.9)	630 (58.4)	546 (33.4)	291 (38.3)	612 (58.5)	476 (28.6)
Both parents	424 (61.5)	432 (40.0)	1074 (65.6)	458 (60.3)	416 (39.7)	1167 (70.0)
Neither parent	4 (0.6)	17 (1.58)	17 (1.0)	10 (1.3)	19 (1.8)	24 (1.4)

et al., 2011; Sanderson et al., 2015), few longitudinal analyses have been conducted where temporal primacy of weight status relative to substance use can be achieved. Compared to findings from cross-sectional studies, longitudinal findings suggest small to moderate effects of obesity or overweight status on subsequent smoking with largely nonsignificant effects on later use of alcohol and marijuana (Huang et al., 2013; Lanza et al., 2014; Pasch et al., 2008, 2012). In the single study to predict timing of first substance use from weight status, Caria and colleagues (2009) found that girls who were obese or overweight in 5th grade were more likely to initiate smoking

through age 18, compared to healthy-weight peers. For males, no significant effect of weight status was observed.

Findings by Caria et al. (2009) highlight sex as a potential moderator of risk associated with weight status, although pooling of data from males and females is typical of analyses published to-date. Such pooling, regardless of reason (e.g., reduced statistical power or desire to generalize more broadly), may obscure important within-group patterns of associations given differences by sex related to substance use and weight status. For example, compared to females, males report earlier use of cigarettes (Harrell et al., 1998), alcohol (Alvanzo et al., 2011), and marijuana (Kosterman

Table 2
Hazard Ratios [and 95% Confidence Intervals] from unadjusted and adjusted models predicting onset of substance use from childhood weight status among females, separately by race/ethnicity.

	Hispanic		Black		White	
	Unadjusted n=759	Adjusted ^a n=755	Unadjusted n=1047	Adjusted ^a n=1046	Unadjusted n=1637	Adjusted ^a n=1634
Cigarettes						
Obese	1.19 [0.87–1.62]	1.24 [0.94–1.64]	0.99 [0.78–1.26]	0.98 [0.79–1.22]	1.12 [0.88–1.43]	1.14 [0.90–1.43]
Overweight	1.16 [0.86–1.57]	1.17 [0.89–1.54]	1.02 [0.74–1.40]	1.02 [0.77–1.36]	1.24 [1.01–1.52]	1.21 [1.00–1.47]
Healthy weight	1.00	1.00	1.00	1.00	1.00	1.00
Underweight <13	0.80	1.28 [0.81–2.02]	1.20	1.04	1.08	1.02
Underweight ≥13	[0.55–1.18]	0.65 [0.40–1.04]	[0.88–1.65]	[0.78–1.38]	[0.85–1.37]	[0.83–1.25]
Alcohol						
Obese	1.08 [0.84–1.39]	1.20 [0.97–1.48]	1.07 [0.91–1.25]	1.03 [0.89–1.20]	1.08 [0.88–1.31]	1.11 [0.92–1.34]
Overweight	1.45 [1.14–1.83]	1.29 [1.04–1.60]	0.94 [0.76–1.16]	0.85 [0.70–1.04]	1.02 [0.86–1.20]	1.05 [0.90–1.22]
Healthy weight	1.00	1.00	1.00	1.00	1.00	1.00
Underweight	1.02 [0.75–1.37]	1.04 [0.79–1.37]	1.12 [0.89–1.41]	1.06 [0.87–1.29]	1.03 [0.86–1.23]	1.04 [0.89–1.21]
Marijuana						
Obese	1.09 [0.80–1.49]	1.13 [0.85–1.51]	1.04 [0.79–1.36]	1.10 [0.86–1.41]	1.09 [0.82–1.44]	1.11 [0.85–1.45]
Overweight <12	2.43 [1.21–4.86]	2.16 [1.11–4.24]	1.28	1.13	1.32	1.29
Overweight ≥12	1.19 [0.82–1.72]	1.15 [0.82–1.60]	[0.94–1.73]	[0.84–1.51]	[1.07–1.65]	[1.05–1.58]
Healthy weight	1.00	1.00	1.00	1.00	1.00	1.00
Underweight	0.89 [0.61–1.31]	1.01 [0.71–1.42]	0.95 [0.69–1.24]	0.81 [0.57–1.14]	0.92 [0.69–1.24]	0.90 [0.70–1.17]

Note. Bold indicates statistical significance. Where brackets are shown, reported risk is equivalent across risk periods (age in years).

^a Controlling for maternal educational attainment, maternal age at first birth, and childhood family structure.

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