Age of First Cigarette, Alcohol, and Marijuana Use Among U.S. Biracial/Ethnic Youth: A Population-Based Study

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Abstract

This study examines age of first cigarette, alcohol, and marijuana use among self-identified biracial youth, using data from the National Longitudinal Study of Adolescent Health (Add Health). We found an intermediate biracial phenomenon in which some biracial youth initiate substance use at ages that fall between the initiation ages of their 2 corresponding monoracial groups. When controlling for the covariates, our findings show White-Asian biracial youth begin smoking marijuana and drinking alcohol at earlier ages than Whites and engaging in all forms of substance use at earlier ages than Asian youth. Results indicate White-American Indian youth start smoking cigarettes at earlier ages than all biracial and monoracial groups. Our findings underscore the need for future research to examine substance-use initiation and progression among biracial/ethnic youth.

Keywords

substance initiation; onset; tobacco; nicotine; drugs; parents

1. Introduction

The bulk of empirical evidence related to initiation of substance use relates to White youth, and followed by research on monoracial/ethnic minority youth. Despite documented racial/

ethnic disparities in substance-use and related problems, little is known about substance initiation among the 5.2 million biracial individuals in the United States—a population projected to triple by 2050 (U.S. Census Bureau, 2008). Many biracial youth experience extraordinary stress stemming from their biracial identity, and this stress likely has an impact on their coping styles (Gibbs & Huange, 2003; Udry, Li, & Hendrickson-Smith, 2003). Compared with monoracial youth, biracial youth are generally at higher risk for health and behavioral problems, including substance use (Udry et al., 2003). However, research examining the epidemiology and etiology of substance use among biracial youth is scarce.

The onset of cigarette, alcohol, and marijuana use typically occurs during adolescence. In addition, early use is associated with social, behavioral, and mental health outcomes (Henry et al., 2011; Peleg-Oren, Saint-Jean, Cardenas, Tammara, & Pierre, 2009) as well as serious physical health consequences (Jacobus, Bava, Cohen-Zion, Mahmood, & Tapert, 2009). Understanding the influence of race/ethnicity, particularly biracialism, on substance initiation can inform prevention efforts for an increasingly visible group in America.

Our study goals were (a) to compare the age of substance-use initiation of biracial/ethnic youth with monoracial/ethnic youth and (b) to examine the influence of sociodemographic variables on age of substance-use initiation. Because parents can be instrumental in delaying children's substance-use initiation (Hirschi, 1969; Moos, 2007) and parental influence might be particularly important for biracial youth (Choi, Harachi, Gillmore, & Catalano, 2006), we also examined the influence a close parent–child relationship has on substance-use initiation. We hypothesized that age of substance-use initiation for each biracial subgroup was intermediate to that of their two monoracial counterparts.

2. Method

2.1 Study Design and Sample

Add Health is a population-based longitudinal study that has followed a U.S. sample from adolescence to adulthood. The sample was drawn from 80 high schools and 52 middle schools that were selected through a stratified random sampling process. Add Health has collected four waves of data: Wave 1 during 1994 and 1995 (when participants were ages 11–21 years), Wave 2 in 1996 (ages 12–22), Wave 3 during 2001 and 2002 (ages 18–28) and Wave 4 (ages 24–34) during 2007 and 2008. Add Health details are available elsewhere (see Harris et al., 2009).

2.2 Measurement of Dependent Variables

2.2.1 Substance Use—This study examined variation in self-reported age of first cigarette, alcohol, and marijuana use. Waves 1 and 4 used identical questions to ask respondents to recall their age at first use of each substance: "How old were you when you smoked a whole cigarette for the first time?"; "How old were you when you first had an alcoholic drink?"; and "How old were you when you first tried marijuana?" Waves 2 and 3 did not ask about first use. If respondents reported substance use at Wave 1, we used that *reported age of first use* as our dependent variable. If no use was reported at Wave 1 but substance use was reported at Wave 2, we used the respondent's actual age at Wave 2 as the

age of initiation variable, because Wave 2 data were collected within a year of Wave1. For non-users in Waves 1 and 2 who reported use in Waves 3 or 4, we used their Wave 4 reported age of first use. If respondents had not used the substance in any Wave, they were coded as non-users.

2.3 Measurement of Independent Variables

2.3.1. Race/Ethnicity—Adolescents were asked to identify their race/ethnicity in Waves 1 and 3. If available, we used the Wave 3 race/ethnicity data for respondents. For cases missing Wave 3 race data, we used self-reports of their race/ethnicity from Wave 1. We considered five major racial/ethnic categories: White, Black, Hispanic, Asian, and American Indian as well as the biracial/ethnic combinations of these categories, such as White-Black or Hispanic-Asian. Monoracial youth are youth who reported only one race/ethnicity (e.g., non-Hispanic White). Biracial/ethnic youth are youth who reported two races/ethnicities (e.g., Black-White. Hispanic-American Indian). In total, we considered 16 categories: 15 unique pairwise combinations of the racial/ethnic identifications and a *multiracial/ethnicity/ other* category of respondents who identified with multiple races/ethnicities (e.g., Black, White, and Hispanic) or no race/ethnicity. The multi/other category was used to identify the effects of the other groups. However, comparisons with the multi/other group are not reported because the group's heterogeneity limited our ability to draw conclusions about individuals in this group.

2.3.2. Closeness to Mother and Father—Respondents provided separate ratings of how close they felt to their mother and father. Responses used a 5-point scale ranging from *not at all close* (1) to *very close* (5).

2.3.3. Covariates—Covariates used as controls included age at Wave 1, gender, family socioeconomic status (SES; measured as parental education), family structure (living with one or two biological parents), community type (urban, suburban, rural), and U.S. region.

2.4 Statistical Analyses

Add Health's Wave 1 survey weights were used to adjust the regression resultsThe primary methodology utilized in the present study is Tobit regression with sample weights. The dependent variables involve two questions: Has the respondent ever used the substance? *If so*, how old was the respondent at first use? The Tobit results are interpreted as linear regression results but they account for the selection of the respondents to use the substance. Non-users are treated as if they *have not yet* used the substance.

3. Results

Table 1 reports the average age at first-use of cigarettes, alcohol, and marijuana for each racial/ethnic group. In addition, the table shows the frequency of substance and percentage of each group's use of each substance. Tobit regression results are presented in Table 2, including age of use of cigarettes, alcohol, and marijuana while controlling for covariates. As noted in 2.2.1, the dependent variable is *age of first substance use;* therefore, positive

coefficients indicate the independent variable influences participants to delay substance initiation until later in life or not at all.

Our findings suggest that a close parent–child relationship is significantly associated with the age of first use of all three substances. Participants who reported being close to their mother, father, or both parents tended to be significantly older when they first used any of the three substances, and more frequently never used these substances.

In comparing differences by race/ethnicity, White was the reference group; thus, coefficients for other racial/ethnic groups are in comparison with the White group. As compared with Whites, respondents who were Black, Asian, White-Hispanic, Black-Asian, and Hispanic-American Indian reported first smoking cigarettes at significantly older ages. However, White-American Indians reported initiating cigarette use at significantly younger ages than Whites. No groups reported alcohol initiation younger than Whites, and the Black, Asian, and White-Hispanic groups reported first drinking alcohol significantly later in life than Whites. Both the Black and Asian groups reported first use of marijuana significantly later in life than Whites, whereas biracial White-Asians first used marijuana when significantly younger than Whites.

Although comparison with the White group is helpful in understanding trends in substance use among racial/ethnic subgroups, other between-group comparisons are needed to fully understand the dynamics. Further, significance tests are only partially illuminating; we can use Tobit results to estimate between-group differences in average age of first use to assess for clinical importance. Table 1 highlights differences between biracial groups and the corresponding monoracial groups in average age of substance-use initiation. These comparisons examined average age of first use of cigarettes, alcohol, and marijuana while controlling for the covariates. Positive numbers indicate the monoracial group had a higher average age of initiation; that is, the group tended to begin using the substance later in life than members of the biracial/ethnic group. Conversely, negative numbers imply that members of the biracial/ethnic group tended to begin using the substance later in life than members of the monoracial group. For example, when controlling for the covariates, White-American Indian respondents tended to begin smoking cigarettes 1.2 years earlier than Whites, used marijuana .6 years earlier than Whites, and began drinking alcohol at the same age as Whites. Comparisons of Blacks and Black-American Indians showed that Black-American Indians smoked cigarettes 1.5 years earlier than Blacks and used marijuana 1.3 years earlier than Blacks, but began drinking alcohol 1 year later than Blacks. Comparisons of Hispanics and Hispanic-Asians showed that Hispanic-Asians typically initiated cigarette smoking .06 years later than Hispanics, began drinking alcohol 3.2 years later than Hispanics, and began smoking marijuana 2 years later than Hispanics. Among Asian and White-Asian respondents, comparisons showed that White-Asians smoked cigarettes 1.1 years earlier than Asians, drank alcohol 2.3 years earlier than Asians, and smoked marijuana 3.8 years earlier than Asians. Among American Indian and Hispanic-American Indian respondents, comparisons revealed that Hispanic-American Indians smoked cigarettes 3.2 years later than American Indians, drank alcohol 1.7 years later than American Indians, and smoked marijuana 1.8 years later than American Indians.

Studies such as Grant and Dawson (1998) have found that after controlling for demographic covariates, the likelihood of substance abuse and dependence is reduced with each year that substance use onset is delayed. Therefore, using substances one year early carries greater health and social consequences. As a result, the findings in Table 1 that reflect earlier substance use by 1 year or more for a group of adolescents are particularly important for practice and prevention. These particular findings are underlined and bolded in Table 1.

4. Discussion

In general, biracial individuals follow Whites with the second highest prevalence rates of substance use (SAMHSA, 2008). Oftentimes when studies examine racial differences in substance use prevalence rates, biracial subgroups are combined into a single group. This aggregation masks important subgroup differences that have implications for prevention and intervention. In support of this notion, the findings of the current study suggest that biracial youth are highly diverse in terms of their substance use initiation. When controlling for covariates, biracial subgroups initiated substance use at ages earlier, later, or similar to White youth. For example and interestingly, White-American Indians started smoking cigarettes at earlier ages than all monoracial and biracial groups. Also, biracial White-Asian youth began smoking marijuana and drinking alcohol at earlier ages than Whites and engaging in all forms of substance use earlier than Asian youth.

These subgroups appear to be particularly vulnerable to early substance use initiation. It may be that these subgroups struggle with forming adaptive coping strategies to combat the unique conflicts related to biracial identity (Gibbs & Huange, 2003), making them more susceptible to early substance use initiation. However, future research is needed to explore associations between ethnic identity development in biracial youth and substance use initiation.

Consistent with previous research, we found an intermediate biracial phenomenon (Authors, in press; Udry et al., 2003). That is, biracial youth seem to initiate substance use at ages approximately mid-way between the initiation ages of their two corresponding monoracial groups. For example, White-Black youth began smoking at about 14.8 years, which is older than Whites (14.3 years) but younger than Blacks (15.7 years). However, this pattern did not hold when covariates (e.g., gender, SES, family structure, community type) were entered into the model. Only 3 of 9 biracial groups—Black-Hispanics, Black-American Indians, and White-American Indian—maintained the same intermediate age of substance initiation beyond the effects of sociodemographic characteristics and closeness to parents. This finding suggests that biracial status itself does not necessarily confer risk, particularly for all biracial groups. Indeed, for some groups, the risk of substance-use initiation appears to stem from the sociodemographic and environmental contexts in which the youth are embedded.

5. Conclusion

This study is the first to estimate and compare age of substance initiation among monoracial/ ethnic and biracial/ethnic individuals in a nationally representative sample. The results highlight the need for a stronger focus on substance use among biracial youth and a better understanding of the broader ecological contexts in which these youth reside. When biracial

youth are examined in aggregate, potential subgroup differences are masked that could help researchers develop targeted interventions. Further, knowing whether the age of initiation of a biracial group is closer to one race versus the other might help practitioners identify shared experiences, such as those related to ethnic identity development contributing to early or late substance-use initiation. This information can provide entry points for targeted intervention and prevention efforts. Although understanding general factors that protect youth from early substance-use initiation (e.g., close parent-child relationships) is important, additional research is needed to clarify the experiences that biracial youth share with one, both, or neither of their constituent racial/ethnic groups that might contribute to substance use.

Acknowledgments

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Highlights

- We found an intermediate biracial phenomenon.

- White-American Indian youth start smoking cigarettes earlier than all groups.

- White-Asian youth begin smoking marijuana and drinking at earlier ages than Whites.

- White-Asian youth engaged in all substances at earlier ages than Asian youth.

Table 1

Average Sample Age of First Use, Average Predicted Age of First use, and Differences in Age of Substance Use Onset Between Monoracial and Biracial Youth

Race/Ethnicity Wave 1 Sample Size	Average Sample Age of First Use / Percent Who Have Ever Used		
	Cigarette	Alcohol	Marijuana
White (N= 10,487)	14.3 (79.1%)	14.9 (84.1%)	15.8 (58.5%)
Black (N= 4,391)	15.7 (60.3%)	15.7 (65.6%)	15.5 (46.9%)
Hispanic (N= 611)	14.5 (63.7%)	15.2 (66.0%)	14.7 (45.7%)
Asian (N= 1,321)	15.8 (61.9%)	16.1 (67.9%)	16.8 (38.8%)
American Indian (N= 148)	13.7 (81.1%)	13.9 (76.4%)	13.5 (64.2%)
White-Black (N= 135)	14.8 (75.6%)	15.0 (80.0%)	16.0 (65.9%)
White-Hispanic (N= 2,202)	15.2 (68.4%)	15.2 (74.6%)	15.6 (48.2%)
White-Asian (N= 145)	14.6 (73.1%)	14.9 (78.6%)	15.2 (64.8%)
White-American Indian (N= 312)	13.5 (85.3%)	14.3 (81.4%)	15.4 (64.4%)
Black-Hispanic (N= 154)	15.0 (69.5%)	15.6 (73.4%)	15.7 (51.3%)
Black-Asian (N= 26)	16.3 (69.2%)	16.2 (73.1%)	14.9 (57.7%)
Black-American Indian (N= 85)	15.1 (63.5%)	15.4 (62.4%)	15.1 (52.9%)
Hispanic-Asian (N= 121)	15.0 (67.8%)	15.3 (67.8%)	15.3 (49.6%)
Hispanic-American Indian (N= 355)	15.1 (73.8%)	15.3 (75.2%)	14.5 (55.8%)
Multi/Other (N= 250)	15.0 (72.0%)	14.5 (70.8%)	15.1 (54.4%)

Difference between Monoracial and Biracial Groups in Predicted Average Age of Substance Use Onset	Cigarette	Alcohol	Marijuana
White - White-Black	17.10 – 20.38 = **–3.28**	16.68 – 17.66 = **–0.98**	19.13 – 19.87 = **–0.74**
White - White-Hispanic	17.10 – 18.15 = **–1.05**	16.68 – 17.53 = **–0.85**	19.13 – 19.46 = **–0.33**
White - White-Asian	17.10 – 17.56 = **–0.46**	16.68 – 16.27 = **0.41**	19.13 – 17.38 = **1.75**
White - White-American Indian	17.10 – 15.89 = **1.21**	16.68 –16.68 = **0**	19.13 – 18.55 = **0.58**
Black - White-Black	20.04 – 20.38 = **–0.34**	18.98 – 17.66 = **1.32**	20.57 – 19.87 = **0.70**
Black - Black-Hispanic	20.04 – 18.94 = **1.10**	18.98 – 18.06 = **0.92**	20.57 – 19.89 = **0.68**
Black - Black-Asian	20.04 – 23.59 = **–3.55**	18.98 – 16.79 = **2.19**	20.57 – 23.62 = **–3.05**
Black - Black-American Indian	20.04 – 18.50 = **1.54**	18.98 – 20.01 = **–1.03**	20.57 – 19.27 = **1.30**
Hispanic - White-Hispanic	17.91 – 18.15 = **–0.24**	16.35 – 17.53 = **–1.18**	18.75 – 19.46 = **–0.71**
Hispanic - Black-Hispanic	17.91 – 18.94 = **–1.03**	16.35 – 18.06 = **–1.71**	18.75 – 19.89 = **–1.05**
Hispanic - Hispanic-Asian	17.91 – 17.97 = **–0.06**	16.35 – 19.59 = **–3.24**	18.75 – 20.71 = **–1.96**
Hispanic - Hispanic-American Indian	17.91 – 18.98 = **–1.07**	16.35 – 18.01 = **–1.66**	18.75 – 19.78 = **–1.03**
Asian - White-Asian	18.70 – 17.56 = **1.14**	18.61 – 16.27 = **2.34**	21.21 – 17.38 = **3.83**
Asian - Black-Asian	18.70 – 23.59 = **–4.89**	18.61 – 16.79 = **1.82**	21.21 – 23.62 = **–2.41**
Asian - Hispanic-Asian	18.70 – 17.97 = **0.73**	18.61 – 19.59 = **–0.98**	21.21 – 20.71 = **0.50**
American Indian - White-American Indian	15.76 – 15.89 = **–0.13**	16.29 – 16.68 = **–0.39**	17.93 – 18.55 = **–0.62**
American Indian - Black-American Indian	15.76 – 18.50 = **–2.74**	16.29 – 20.01 = **–3.72**	17.93 – 19.27 = **–1.34**
American Indian - Hispanic-American Indian	15.76 –18.98 = **–3.22**	16.29 – 18.01 = **–1.72**	17.93 – 19.78 = **–1.85**

Table 2

Tobit Regressions for the Age of First Cigarette, Alcohol, and Marijuana Use

Variable	Cigarette	Alcohol	Marijuana
Black	4.002*** (0.410)	2.535*** (0.336)	2.933*** (0.609)
Hispanic	1.036 (0.958)	−0.351 (0.691)	−0.703 (1.504)
Asian	2.101*** (0.572)	2.114*** (0.478)	4.355*** (0.906)
American Indian	−1.629 (0.982)	−0.419 (0.738)	−2.172 (3.006)
White-Black	4.514 (2.399)	1.051 (1.117)	1.446 (3.096)
White-Hispanic	1.353** (0.473)	0.914* (0.392)	0.636 (0.731)
White-Asian	0.589 (1.319)	−0.443 (0.696)	−3.100* (1.571)
White-American Indian	−1.472* (0.692)	−0.003 (0.760)	−1.075 (1.138)
Black-Hispanic	2.424 (2.451)	1.494 (1.479)	1.489 (3.034)
Black-Asian	10.252* (4.559)	0.115 (1.192)	10.953 (6.090)
Black-American Indian	1.821 (3.034)	3.737 (2.386)	0.260 (3.071)
Hispanic-Asian	1.124 (1.957)	3.246 (2.000)	3.227 (3.398)
Hispanic-American Indian	2.473* (1.113)	1.444 (0.943)	1.272 (1.755)
Multirace/Other****	0.732 (1.305)	0.278 (0.843)	−2.561 (1.770)
Age at wave 1 interview	0.382*** (0.070)	0.115* (0.053)	0.268** (0.102)
Sex	1.553*** (0.232)	1.203*** (0.176)	3.408*** (0.347)
Family Structure	1.500*** (0.286)	0.430 (0.228)	2.083*** (0.430)
Community Type			
Suburban	−1.696 (0.253)	−0.221 (0.195)	−0.273 (0.380)
Rural	0.141 (0.350)	−0.421 (0.256)	0.793 (0.533)
Region			
Midwest	−1.162** (0.361)	−1.035*** (0.272)	−1.533** (0.516)
South	−1.214*** (0.325)	−0.541* (0.251)	−0.490 (0.470)
Northeast	−0.784 (0.416)	−0.582 (0.302)	−0.578 (0.591)
Closeness to mother figure	0.604*** (0.150)	0.520*** (0.122)	0.765** (0.241)
Lost mother figure	11.351 (6.060)	5.543* (2.392)	86.260
Closeness to father figure	1.010*** (0.123)	0.644*** (0.111)	1.586*** (0.199)
Lost father figure	2.337 (10.660)	6.837 (5.114)	0.593
Constant	4.406** (1.663)	11.414*** (1.312)	11.984*** (2.500)
Estimated SE of the Regression	8.618 (0.124)	6.479 (0.111)	11.844 (0.149)
Pseudo R2	0.009	0.009	.011
N	10557	10439	9876

Standard Error in parentheses.

*
p < 0.05,

**
p < 0.01,

***
p < 0.001

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Multirace/Other refers to respondents who self-identified with three or more races/ethnicities or no races/ethnicities.