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Similarities and Differences in Alcohol Trajectories: Testing the Catch-Up Effect among Biracial Black Subgroups

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Abstract

Using National Longitudinal Study of Adolescent and Adult Health (Add Health) data, we examine the alcohol-use trajectories of monoracial Black youth and biracial Black-White, Black-Hispanic, and Black-American Indian youth to assess how their trajectories differ from the alcohol-use trajectories of White youth over time. The sample consists of 9,421 adolescents and young adults who self-identified as White, Black, Black-American Indian, Black-Hispanic, or Black-White. Study hypotheses are tested using latent growth curve modeling. Results indicate that a catch-up effect exists, but only for Black-American Indians whose alcohol-use rates approach the higher rates of Whites at age 29. Black-American Indians face particularly high risk of problematic drinking over the life course. Additional research is needed to understand causal factors of alcohol-use among biracial individuals particularly Black-American Indians who may be at higher risk for alcohol misuse.

Keywords

mixed-race; multiracial; adolescent; adult; binge drinking; heavy episodic drinking

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1. Introduction

Problematic alcohol consumption during adolescence and young adulthood has clear consequences with the potential to negatively affect development across the life course (Maggs & Schulenberg 2005), such as executive functioning impairments leading to critical cognitive deficits (Guerri & Pascual 2010; Parada et al., 2012), and a host of negative outcomes including injury and death (Quigley & Leonard 2005) and sexually transmitted disease (Ramisetty-Mikler, & Ebama 2011). Research also demonstrates that age of alcohol use initiation is linked with both the intensity of alcohol consumption in adolescence and patterns of alcohol use in adulthood (Hingson, Heeren, & Winter, 2006).

Generally, alcohol consumption has been found to increase during adolescence (12–17 years), reach its apex in emerging adulthood (18–25 years), and decrease in the transition to adulthood (Maggs & Schulenberg 2005). However, this trend is most often observed among predominately White samples (Catalano et al. 1993; Clark, Corneille, & Coman 2013). Both longitudinal and cross-sectional prevalence studies find racial/ethnic differences in alcohol-use trajectories that diverge from White patterned alcohol use (Chen, Balan, & Price 2012; Clark et al. 2013;).

Increasingly, researchers explore the disparate alcohol-use trajectories among monoracial/ethnic groups. Studies show that although Black adolescents and emerging adults report lower rates of alcohol consumption than White adolescents, in later young adulthood (i.e., after age 25), Black adult alcohol use increases and crosses over levels of White alcohol consumption (Geronimus, Neidert, & Bound, 1993). These findings highlight the “catch-up” or “cross-over” phenomenon that has been observed for Blacks (e.g., Geronimus et al. 1993).

Examination of the catch-up/cross-over effect merits significantly more study, as this phenomenon highlights a point in which health disparities emerge (Biafora & Zimmerman, 1998). At present, most studies of the catch-up or cross-over effect focus solely on Blacks as an aggregated group (Geronimus et al., 1993; Watt, 2008; Vogt Yuan, 2011). When groups are aggregated, important information about subgroups may be lost. Indeed, preliminary findings suggest that significant heterogeneity exists in drinking patterns for monoracial and among biracial Black individuals. For example, a recent study found that Black-White and Black-American-Indian adults, respectively, report the highest levels of alcohol consumption in comparison to monoracial Blacks and other biracial Black groups (Clark et al., 2013). The purpose of the current study was to build on preliminary research by examining additional alcohol-use variables (e.g., binge drinking) and using latent growth curve modeling, to assess the extent to which the catch-up effect exists for biracial Black individuals. Identification of the onset of health disparities is a primary and necessary step to eradication of such inequality (Biafora & Zimmerman, 1998). We hypothesized that rates of alcohol use among Black-Whites and Black-American Indians would catch -up to or cross -over the alcohol-use trajectories of Whites at younger ages than monoracial Blacks.

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2. Method

2.1 Study Design and Analytic Sample

The data come from the National Longitudinal Study of Adolescent and Adult Health (Add Health), which is a national representative sample of 20,745 adolescents and young adults living in the United States who were followed from ages 11 to 33 (Harris et al. 2009). Add Health collected data in 1994–1995 (Wave 1), 1996 (Wave 2), 2001–2002 (Wave 3), and 2007–2008 (Wave 4). The starting analytical sample consisted of 9,421 participants who were present in all four waves of the Add Health study and had longitudinal weights.

2.2 Measures

2.2.1 Alcohol-Use Variables—Respondents' *lifetime alcohol use* was assessed with a yes/no question: "Have you had a drink of beer, wine, or liquor – not just a sip or a taste of someone else's drink – more than 2 or 3 times in your life?" To quantify the *intensity of use in the past year*, respondents were asked "Think of all the times you have had a drink during the past 12 months. How many drinks did you usually have each time?" which ranges from 1 to 90. *Binge drinking* was assessed with the question "Over the past 12 months, on how many days have you drank five or more drinks in a row?" This is an ordinal variable with categories "*Never*," "*1 or 2 days*," "*once a month or less*," "*2 or 3 days a month*," "*1 or 2 days a week*," "*3 to 5 days a week*," and "*every day or almost every day*." If the respondent answered anything other than "*Never*," we considered the respondent to have engaged in binge drinking at least once in the last 12 months.

2.2.2 Race—Participants were asked, at both Waves 1 and 3, to identify themselves as either "*Black," "White," "Hispanic," "American Indian," "Asian or Pacific Islander*," or "*other*." We used Wave 3 race data, supplementing it with Wave 1 data for any missing cases. Participants were considered as identifying as monoracial if they selected only one race/ethnicity and were considered biracial if they selected two racial/ethnic groups. The "multiracial" group includes the racial/ethnic groups we were not interested in examining in the current study such as multiracial individuals (those who selected 3 or more racial/ethnic categories) and monoracial and biracial Asians. This group is only represented in the intercept terms.

2.2.3. Covariates—*Gender, family structure, parent education, and nativity* were assessed in Wave 1.

2.3 Statistical Analyses

Analyses were conducted using Mplus version 6.1 (Muthén and Muthén 1998–2012). All analyses incorporated stratification and survey weights. Data were analyzed by applying a cohort sequential design in which age was the unit of time (Bollen & Curran, 2006). Mplus uses an EM-algorithm for missing data (Duncan et al., 2006; Fuemmeler et al., 2013). Latent growth curve modeling was used to test the study's hypotheses. *Lifetime alcohol use* was analyzed using a logit link with an intercept, slope, and quadratic term. For the *intensity of use in the past year*, a negative binomial model with an intercept, slope, quadratic and cubic terms was used. The *binge drinking* outcome was analyzed using a proportional odds model

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with intercept, slope, quadratic and cubic terms. Unconditional models for the three outcomes were first created. Linear, quadratic, cubic and higher order terms were included sequentially. BIC informed us on the number of terms to keep. If an additional term led to an increase in BIC, it was not included and neither were any subsequent higher order terms.

The growth curves were regressed on the intercept, slope, quadratic and cubic terms. These latent terms describe how the trajectory of alcohol use changes with age. The latent terms are regressed on race and the covariates. Wald's chi-square tests were used to determine whether significant differences existed between the White racial group and the following racial groups: Blacks, Hispanics, American Indians, Black-Hispanics, Black-American Indians and Black-Whites; each test corresponds to one biracial and the White group. If a null hypothesis is rejected, we inspect this difference via population averages and individual level effects. Population alcohol drinking averages (i.e., percentage of the population who has drank once, average number of drinks drank, and percentage of the population who binge drinks) of each biracial group's drinking at different ages were compared to the White population. Individual level effects show the changes in the likelihood of alcohol use of a biracial individual compare to a monoracial individual, across different ages. We adjusted for multiple testing with a false discovery rate (FDR) correction at the 0.05 level (Benjamini & Yekutieli 2001). We report only the results that were significant at the 0.05 FDR level, except as otherwise noted.

3. Results

3.1 Sample Characteristics

The analytic sample ranged from ages 13 to 32 years. More than half of the analytical sample was female (54 percent). The largest to smallest racial groups were: White (n = 5,120), Black (n = 1,826), Hispanic (n = 80), American Indian (n = 63), Black-Hispanic (n = 68), Black-White (n = 46), and Black-American Indian (n = 32). Eighteen percent of participants' primary caregivers had less than a high school education, 39 percent had a high school or GED degree, and 42 percent had some college education or a college degree, mirroring national characteristics (Pew Research Center Analysis of 2008–2010).

3.2 Latent Growth Curve Modeling Shows Changes in Alcohol Use

Table 1 presents the coefficients and standard errors for *lifetime alcohol use*, *intensity of use in the past year, binge drinking*. Figure 1 presents graphs of the population means for all three models.

3.3 Catch Up Hypothesis

At age 13, Whites have a drinking average of 1.5 drinks consumed on each occasion while Black-American Indians have an average of 0.5 drinks on each occasion. At age 13, the mean number of drinks consumed on each occasion is 4.5 times larger for a White individual than a Black-American Indian individual. At age 19, Whites have a mean of 4.8 drinks and Black-American Indians have a mean of 1.3 drinks. At age 19, the mean number of drinks on each occasion is 3.7 times larger for a White individual than a Black-American Indian individual. After age 19, the number of drinks Black-American Indians consumed began

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catching-up to the rates of Whites, and the difference between their means decreased over time. This difference is smallest at age 29 when Whites report a mean of 3.0 and Black-American Indians report a mean of 2.5 drinks. At age 29, the mean number of drinks on each occasion of a White individual is 1.17 times larger for a White individual than a Black-American Indian individual. Thus, these findings provide evidence of a catch-up effect occurring at age 29.

3.4 Supplementary Findings

For Black-American Indian youth, being biracial seems to be accompanied with some protective factors, since in comparison to American Indian youth, they have better outcomes. Black-American Indian youth had a lower prevalence of alcohol use than American Indian youth between ages 14 and 27. Also, across all ages for our sample, Black-American Indian youth had a lower average of drinks consumed than American Indian youth Finally, between ages 13 and 20, and between ages 30 and 32, Black-American Indian youth had a lower prevalence of binge drinking.

4. Discussion

We found evidence of a catch-up effect for Black-American Indians in intensity of drinking. The significantly lower intensity of drinking for Black-American Indians during adolescence increased over time and approached the rates of Whites by age 29. Our results indicate that in young adulthood, Whites may begin to drink fewer drinks per drinking episode whereas Black-American Indians begin to drink more drinks per episode. This finding is inconsistent with a previous study that found Black-American Indians reported lower drinking intensity than Whites and other racial/ethnic groups (Clark, Corneille, et al., 2013). However, the previous study measured intensity of drinking by assessing the number of days on which respondents reported drinking. We chose to measure intensity of drinking by assessing the number of drinks respondents consumed per episode because frequency of drinking days is not necessarily indicative of problem drinking. It should be noted that biracial Black-American Indians' counterparts, monoracial American Indians, tend to report alcohol use rates that are higher than Asians, Blacks, and multiracial individuals but lower than Whites and Hispanics (Substance Abuse and Mental Health Services Administration, 2014). Therefore, the higher rates of Black-Americans may be related to a lived experience that is similar to monoracial American Indians. Emerging and young adulthood are developmental periods when individuals become more independent. It is possible that during young adulthood Black-American Indians experience a greater number and severity of risk factors such as stress, microaggressions, and institutional discrimination (Walters, Simoni, & Evans-Campbell, 2002) while experiencing fewer protective factors such as family communication and support. Thus, the disproportionate number of risk factors relative to protective factors may be associated with the increase in drinking intensity for Black American Indian young adults.

It is important to note that we did not find a catch-up effect for monoracial Blacks or biracial Black-Whites and Black-Hispanics for any of the included alcohol variables. Certain factors may impact drinking trajectories of Black-American Indians differently than other Black-

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biracial groups. For example, historical loss plays a particularly salient role in drinking outcomes among American Indians (Whitbeck, Chen, Hoyt, & Adams, 2004). It is possible that the impacts of discrimination experienced from both minority status combined with historical loss work to negatively influence alcohol trajectories differently than other biracial Black individuals. Additional research is needed to further disentangle patterns of alcohol-use intensity across biracial groups. Specific factors that influence diverse drinking trajectories of biracial Black young adults, especially Black-American Indians, must be explored. Such information may inform prevention programs by determining higher risk subgroups and risky developmental periods for biracial Blacks. Our findings suggest that addiction treatment may be needed by Black-American Indians during young adulthood in particular. Attention should be given to minimizing barriers to treatment for Black-American Indians such as lack of transportation and avoidance of care due to fear of discrimination (Browne & Fiske, 2001).

4.1 Strengths and Limitations

Our study relied on self-reported data. In addition, our biracial sample sizes were relatively small. However, we used R Version 3.2.3 to assess statistical power through simulations. We assessed the smallest biracial group (Black-American Indians) and were able to reject the test 98% of the time, at a 0.05 significance level, suggesting we had sufficient power to test the study's hypotheses. Despite limitations, our study has strengths. First, we used a nationally representative, population-based sample. Second, we used latent growth curve modeling to test our hypotheses. Latent growth curve modeling is a powerful method for examining changes in outcomes. Third, our study helps to fill a large gap regarding the prevalence and patterns of substance use among biracial individuals.

5. Conclusion

Our results suggest that Black-American Indians may be the biracial group most at risk for problematic drinking in young adulthood. Compared to Black-Whites and Black-Hispanics, Black-American Indians reported higher rates of lifetime alcohol use and the most intense use of alcohol as measured by the number of drinks had consumed on each occasion. Black-American Indians were also the only biracial group to catch up to the intense alcohol use rates of Whites, demonstrating evidence of a catch-up effect. Taken together, these findings demonstrate the need for additional research that seeks to understand alcohol use and problem alcohol use among biracial individuals.

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Highlights

- An alcohol-use catch-up effect was observed among black-American Indian young adults.
- Black-American Indians face particularly high risk of problematic drinking over the life course.

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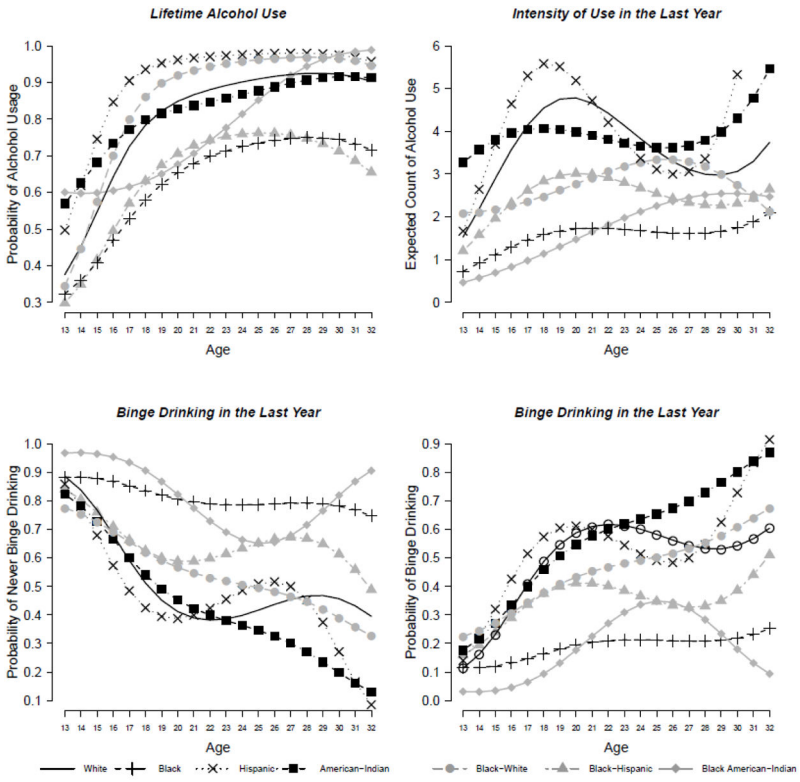

Figure 1.
Alcohol Use Lifetime Trajectories

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Table 1

Effects of Covariates on Intercept, Slope, Quadratic and cubic Factors of the Growth Model

	Have you ever had a drink?						On how many days did you have you drink five or more drinks?							
	Intercept		Slope		Quadratic		Intercept		Slope		Quadratic		Cubic	
	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Hispanic	10.73	5.28	36.72	13.50	−12.89	6.49	0.25	0.72	7.07	3.74	−11.54	5.44	4.71	2.18
White	−1.72	1.42	6.88	5.23	−1.37	2.76	−0.41	0.39	2.74	1.51	−2.97	1.78	0.97	0.63
Black	−8.41	4.51	−12.31	4.97	2.38	2.71	−0.64	0.54	−4.63	2.10	4.73	2.46	−1.23	0.86
A. Indian	12.41	4.58	−27.41	10.62	13.41	5.36	0.52	0.74	−0.70	3.09	0.19	3.98	0.51	1.49
Black-White	−7.32	4.79	31.97	15.02	−10.09	6.61	1.18	1.52	−5.26	6.06	4.53	7.19	−0.92	2.52
Black-Hispanic	−8.61	6.37	5.15	14.36	−6.89	10.02	0.24	2.92	0.76	15.98	−2.81	21.19	1.32	7.73
Black A. Indian	13.63	7.83	−76.25	29.62	49.49	17.10	−3.50	1.84	−1.60	7.49	7.01	9.10	−3.26	3.41
Gender	1.41	1.58	1.11	4.28	−3.51	2.59	0.65	0.22	−5.26	0.78	4.69	0.90	−1.24	0.32
Parent Edu. 2	−2.31	1.63	22.42	7.12	−9.53	3.65	−0.95	0.36	4.43	1.37	−4.01	1.67	1.10	0.61
Parent Edu. 3	−1.54	1.93	25.09	8.23	−7.18	3.34	−1.45	0.39	6.59	1.57	−6.03	1.89	1.70	0.67
Family Str. 2	0.17	1.92	−10.29	5.44	2.22	3.47	−1.19	0.42	4.11	1.78	−4.39	2.16	1.44	0.76
Family Str. 3	−8.99	3.27	4.00	4.06	0.43	1.92	−1.35	0.25	3.61	1.02	−2.99	1.21	0.79	0.43
Nativity 2	4.75	2.71	12.23	9.91	−6.92	5.97	1.93	0.76	−2.64	3.32	2.41	3.83	−0.82	1.30
Nativity 3	9.56	2.93	0.21	7.24	0.25	3.82	2.33	0.68	−3.00	2.90	2.41	3.34	−0.73	1.14

	How many drinks did you have?							
	Intercept		Slope		Quadratic		Cubic	
	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Hispanic	0.40	0.57	2.17	2.46	−4.12	2.95	1.75	1.03
White	−0.09	0.22	0.55	0.84	−0.49	0.96	0.13	0.33
Black	−1.03	0.27	−0.14	1.02	0.62	1.18	−0.21	0.41
A. Indian	0.63	0.52	−1.99	2.43	1.82	2.65	−0.43	0.84
Black-White	0.05	0.95	−3.10	3.93	4.42	4.68	−1.56	1.63
Black-Hispanic	−0.24	1.16	0.30	5.67	−0.32	6.87	0.12	2.38
Black A. Indian	−1.59	1.18	−0.45	5.08	2.33	5.83	−0.92	1.94
Gender	0.20	0.13	−1.59	0.44	1.30	0.49	−0.35	0.17

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	Have you ever had a drink?						On how many days did you have you drink five or more drinks?							
	Intercept		Slope		Quadratic		Intercept		Slope		Quadratic		Cubic	
	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.	Est.	S.E.
Parent Edu. 2	−0.42	0.21	2.79	0.82	−3.12	0.92	0.97	0.31						
Parent Edu. 3	−0.50	0.19	3.06	0.76	−3.48	0.86	1.10	0.29						
Family Str. 2	−0.35	0.21	1.26	0.80	−1.55	0.91	0.57	0.31						
Family Str. 3	−0.72	0.14	1.58	0.57	−1.17	0.66	0.27	0.23						
Nativity 2	1.50	0.43	−2.24	1.59	1.54	1.74	−0.38	0.58						
Nativity 3	1.77	0.38	−2.65	1.43	1.62	1.61	−0.31	0.55						

The reference group are participants who are male, multiracial, whose parents have less than a high school education, who lived with both of their parents and who were not born in the US.