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Racial/ethnic differences in the time-varying association between alcohol expectancies and drinking during the transition from childhood to adolescence

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Abstract

Alcohol expectancies are important determinants of adolescent drinking, but this relationship may differ based on race/ethnicity. This study used time-varying effect modeling to examine racial/ethnic differences in positive and negative alcohol expectancies and their relationship with drinking among White, African American, and Hispanic youth. Youth reported alcohol expectancies and drinking frequency from 5th-10th grade. African Americans initially endorsed higher positive alcohol expectancies than Whites, but its relationship with drinking was stronger among Whites. Hispanic youth reported slightly higher negative alcohol expectancies in high school, but the relationship between negative expectancies and alcohol use was comparable across groups. The effect of expectancies on alcohol use outcomes may be more robust for Whites, which warrants investigation of risk factors for minority youth.

Keywords

Alcohol expectancies; Adolescent; Alcohol; Time varying effect model; Race and ethnicity

Introduction

Beliefs about the personal positive and negative consequences of alcohol use, referred to as positive and negative alcohol expectancies, respectively, develop in childhood prior to drinking initiation, typically forming by the time children reach 5th grade (Bekman, Goldman, Worley, & Anderson, 2011; Chartier, Hesselbrock, & Hesselbrock, 2010). Understanding the development of alcohol expectancies is important, as positive alcohol expectancies have been found to predict drinking initiation (Fisher, Miles, Austin, Camargo Jr., & Colditz, 2007; Maggs, Staff, Patrick, Wray-Lake, & Schulenberg, 2015), frequency of drinking (Settles et al., 2014; Tobler, Livingston, & Komro, 2011) and binge drinking

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(Fisher et al., 2007; Maggs et al., 2015) during adolescence, as well as subsequent alcohol-related problems during adulthood (DeWit, Adlaf, Offord, & Ogborne, 2000; Gruber, DiClemente, Anderson, & Lodico, 1996). Conversely, negative alcohol expectancies have been found to protect against drinking initiation and problem drinking among adolescents (Bekman et al., 2011a; Maggs et al., 2015). Moreover, the relationship between alcohol expectancies and drinking is reciprocal: adolescents with more positive expectancies and less negative expectancies are more likely to use alcohol and subsequently endorse high positive and low negative expectancies to a greater degree—in turn increasing their risk for future drinking (Settles, Zapolski, & Smith, 2014; Smith, Goldman, Greenbaum, & Christiansen, 1995). However, much of the work stated above has been conducted with predominately White samples, providing little insight as to whether the risk posed by alcohol expectancies operates similarly across racial/ethnic groups.

Examining such differences is important given evidence of racial/ethnic differences in developmental trends for drinking (Chen & Jacobson, 2012). Specifically, among the three largest racial/ethnic groups in the U.S., African American youth have been shown to report the lowest incidence of drinking across development compared to White and Hispanic youth (Miech, Johnston, O'Malley, Bachman, & Schulenberg, 2016; Swendsen et al., 2012; Wallace et al., 2003). Conversely, Hispanic adolescents have been shown to endorse the highest drinking rates in early adolescence (Chen & Jacobson, 2012), but show slower increases in drinking rates and quantity throughout adolescence, ultimately resulting in lower rates of use than Whites but higher rates than African Americans (Chen & Jacobson, 2012; Miech et al., 2016). Thus, it is possible that the racial/ethnic differences in drinking outcomes may be explained, at least in part, by racial/ethnic differences in alcohol expectancies. However, to date, research is sparse examining racial/ethnic differences in both alcohol expectancy endorsement and its relationship to alcohol outcomes. Moreover, among the available research, findings are inconclusive.

For example, among African Americans, some studies have documented lower endorsement of positive alcohol expectancies compared to White youth (Rinehart, Bridges, & Sigelman, 2006) whereas others have documented higher endorsement of positive alcohol expectancies compared to White youth (Corvo, 2000; Hipwell et al., 2005). Specifically, among children ages 7–10, Corvo (2000) found that African Americans endorsed higher expectancies that alcohol increases arousal whereas Hipwell et al. (2005) found that African Americans endorsed higher expectancies that alcohol increases positive affect, relative to Whites. However, when examining racial differences in alcohol expectancies across three independent samples of African American and White schoolchildren, Rinehart et al. (2006) found three contrasting results. In the first sample, composed of children in grades 1–6, White schoolchildren endorsed higher expectancies that alcohol would lead to positive affect than African Americans, with no differences in negative alcohol expectancies. In the second, composed of children in grades 3–6 White schoolchildren endorsed lower negative alcohol expectancies that alcohol would lead to a loss of control than African Americans; in the third, also with children in grades 3–6, no racial differences in any type of expectancy endorsement were found. These discrepancies may be partially attributable to wide age ranges in previous samples, as there is some evidence that racial differences in alcohol expectancy endorsement change with age. Specifically, among a sample of African

American and White girls examined from ages 7 to 10, Chung, Hipwell, Loeber, White, and Stouthamer-Loeber (2008) and Hipwell et al. (2005) found that African Americans endorse higher positive alcohol expectancies than Whites at age 7; however, their expectancies increase only marginally, while those of White children increase rapidly over time, such that expectancy endorsement converges between the two groups of children by age 10. To date, this is the only longitudinal study that has examined race differences in positive alcohol expectancies among African American and White youth, with no study to our knowledge that has examined this relationship for negative alcohol expectancies or included boys. Thus, more research is needed to understand patterns of endorsement of positive and negative alcohol expectancies among African American youth.

Research is also sparse examining African American—White differences in the impact of alcohol expectancies on drinking outcomes. Evidence suggests a stronger effect of positive expectancies on alcohol use for White youth (Chartier, Hesselbrock, & Hesselbrock, 2009) with some researchers oberving a significant effect for White youth, but a null effect for African American youth (Banks & Zapolski, 2017; Meier, Slutske, Arndt, & Cadoret, 2007). This finding of a weaker effect of postive alcohol expectancies on drinking for African American youth may partially explain lower drinking outcomes. Yet, it is unclear how negative expectancies may impact race differences in drinking outcomes as to date, no study examining this relationship has been conducted.

Most work examining racial/ethnic differences in alcohol expectancy endorsement has excluded Hispanic youth. Among available research, it has been documented that non-White (primarily Hispanic) children endorse lower positive alcohol expectancies and higher negative alcohol expectancies than their White peers (Bekman et al., 2011b). Moreover, among adolescents, researchers have either found similar rates of expectancy endorsement among Hispanics and Whites (Meier et al., 2007; Shih, Miles, Tucker, Zhou, & Amico, 2010) or found that Hispanics endorse less positive alcohol expectancies than Whites (Chartier et al., 2009). Thus, lower positive expectancies and higher negative expectancies may explain lower risk for alcohol use during adolescence for Hispanic youth compared to their White peers. However, among the limited research examining ethnic differences in this relationship, there is some evidence that positive alcohol expectancies have similar effects on drinking outcomes among Hispanic and White youth (Chartier et al., 2009; Meier et al., 2007). For example, Chartier et al., (2009) found that for both Hispanic and White adolescents and young adults, increaes in positive alcohol expectancies were associated with drinking initiation. Similarly, Meier et al. (2007) found no differences between White and Hispanic adolescents in the relationship between positive alcohol expectancies and several indicators of alcohol use (initiation, frequency, and binge drinking). Conversely, low negative alcohol expectancies have been shown to have stronger effects on drinking initiation among Hispanic youth than White youth (Shih et al., 2010).

Thus, based on the current literature, findings are inconclusive as to whether there are racial/ethnic differences in postive and negative alcohol expectancies, with no clear understanding on the effect of alcohol expectancies on alcohol outcomes for African American and Hispanic youth. Examining racial/ethnic differences in the relationship between alcohol expectancies and alcohol use across adolescence is important, as findings can be used to

inform prevention programming, which may need to be tailored differently if one is working with predominately White youth versus racial/ethnic minority youth. The current study fills this gap in the literature by using time-varying effect modeling (TVEM; Tan, Shiyko, Li, Li, & Dierker, 2012), a flexible approach that models dynamic associations over time, to examine endorsement of positive and negative expectancies and their association with alcohol use among a cohort of non-Hispanic African American, non-Hispanic White, and Hispanic youth across a large developmental period (5th to 10th grade). This approach will address limitations in previous literature, including the use of cross-sectional data, the exclusion of negative expectancies and male youth, and restricted age ranges. Moreover, by examining these relationships as a function of time, this study can help resolve mixed findings on racial/ethnic differences due in part to age effects (e.g., Chung et al., 2008; Hipwell et al., 2005)

Materials and Methods

Participants and Procedure

The current study includes participants drawn from a 6-year longitudinal study assessing developmental changes in drinking, smoking, and disordered eating among youth from 5th to 10th grade. Youth were recruited from 23 public elementary schools in two school districts in the Southeast region of the U.S., with most youth living in urban and suburban areas (i.e., 7% of youth endorsed backgrounds from Appalachia). Children at each school were invited to participate using an opt-out informed parental consent procedure and active child assent. Surveys were administered at the end of the participants' 5th grade year, twice per year from 6th grade year to 8th grade, and once a year during their 9th and 10th grade year, resulting in 9 waves of data. All study procedures were approved by the institutional review board at the University of Kentucky.

Out of 1,988 5th graders in the participating schools, 1,906 participated in the study (95.9%). Retention rates across waves were high, with 89% completing all waves of data collection. The current study included participants who identified themselves as either non-Hispanic African American, non-Hispanic White, or Hispanic (the remainder of students in the sample identified as Asian [n = 50], Arabic [n = 6], or Other [152], or did not indicate their race/ethnicity [166]). The total subsample for the current study was 1,529 participants (69.3% White, 17.2% African American, and 7.5% Hispanic) and was equally divided between boys (49.1% of Whites; 54.8% of African Americans; 49.3% of Hispanics) and girls. At Wave 1 (5th grade), participants were ages 9–13 (M = 10.87) and at Wave 9 (10th grade) participants were ages 15–17, (M = 15.71).

Measures

The Memory Model-Based Expectancy Questionnaire (Dunn & Goldman, 1996) provides an assessment of youth alcohol expectancies in four domains: positive social (18 items), "wild and crazy" (9 items) behaviors, negative arousal (7 items), and sedation/impairment (7 items). The scale begins with the stem, "Drinking alcohol makes people ____." Youth provide responses on a 4-point Likert scale from "never" (1) to "always" (4). Examples of stems in each domain include: "friendly" and "fun" for positive social, "goofy" and "hyper"

for wild/crazy, "mad" and "sad" for negative arousal, and "sleepy" and "stupid" for sedation. Similar to previous studies (Dunn & Goldman, 1996; Settles et al., 2014), positive social and wild/crazy expectancies were considered domains of positive alcohol expectancies whereas negative arousal and sedation/impairment expectancies were considered domains of negative alcohol expectancies. In the current sample, two items were dropped from the wild/crazy scale ("calm" and "quiet"), as they had very low item-total correlations. After these items were removed, internal consistency estimates for each subscale were strong (positive social: $\alpha = .84$, wild/crazy: $\alpha = .84$, negative arousal: $\alpha = .82$, sedation: $\alpha = .80$).

The Drinking Styles Questionnaire (DSQ; Smith et al., 1995) was used to measure self-reported drinking frequency. There is good evidence for the reliability and validity of this item in adolescents (Smith et al., 1995). Typical drinking frequency was measured from an item with responses ranging from (1) "I have never had a drink of alcohol" to (6) "I drink alcohol almost daily."

The Pubertal Development Scale (PDS: Petersen, Crockett, Richards, & Boxer, 1988) was included as a covariate. This scale consists of two five-item questionnaires: one for boys and one for girls. Boys are asked questions such as "Do you have facial hair yet?" whereas girls are asked, "Have you begun to have your period?" Responses were on a 4-point scale and were averaged for a scaled score ranging from 1–4. Scores on this scale correlate highly with physician ratings and other self-report measures of puberty (Brooks-Gunn, Warren, Rosso, & Gargiulo, 1987; Coleman & Coleman, 2002). As permitted by the PDS, scores were dichotomized as pre-pubertal or pubertal, with scores above 2.5 indicative of pubertal onset.

Data Analysis

Attrition for the study was low, with 89% of participants completing all waves of data collection. Those who participated at all waves did not differ from those who participated in fewer waves on any study variables. A missing data analysis was also performed (Littles MCAR = 0.99), indicating that data was missing completely at random. Thus, all missing data was imputed using expectation maximization (Little & Rubin, 1989) in SPSS, which provides more accurate estimates of population parameters than other methods (Enders, 2006). This resulted in a total of 13,761 observations across 9 waves. Subsequent analyses were performed using the TVEM SAS Macro (Li et al., 2015) in SAS 9.4. Like logistic regression, TVEM estimates intercept and slope coefficients based on a predictor and an outcome, but it requires no constraints on the shapes of the intercept and slope functions, allowing predictors to vary as a non-parametric function of time (Lanza, Vasilenko, Liu, Li, & Piper, 2013).

Analyses proceeded in three parts. First, we ran one-way ANOVAs to examine racial differences in alcohol use across waves. Second, we examined trends in alcohol expectancies by conducting normal intercept-only TVEMs stratified by race/ethnicity to estimate change in each domain of alcohol expectancies over time among each group. Third, to examine the relationship between alcohol expectancies and alcohol use, we used Gaussian TVEMs to regress drinking frequency onto each domain of alcohol expectancies. These models were stratified by race/ethnicity to examine whether changes varied by group. All analyses used a P-spline smoothing approach with 10 knots, as recommended by Li et al. (2015) for

observational data. Results of these analyses are presented as figures as the coefficients are estimated as a function of continuous time, creating a number of coefficients across each wave too large to present in tables. Coefficients are represented by black lines and 95% confidence intervals represented by gray lines. When confidence intervals do not include zero, there is a significant association between the predictor and the outcome. To examine racial/ethnic differences, differences were evaluated by examining whether there was overlap in the confidence intervals between each group. This approach has been documented as an appropriate technique for evaluating group differences across time and is more conservative than the use of significance testing (Schenker & Gentleman, 2001).

All analyses included gender as a time-invariant covariate, pubertal onset as a time-varying covariate due to its association with race (Herman-Giddens, 2006) and drinking (Settles et al., 2014), and drinking onset as a time-varying covariate due to the reciprocal relationship between alcohol expectancies and drinking (Settles et al., 2014; Smith et al., 1995). Logistic models were analyzed with and without the inclusion of puberty; the pattern of results did not differ after adjusting for puberty. A school variable was not included in the models, as interclass correlations (ICCs) examined for a school effect on the study variables ranged from 0.00 to 0.03, indicating no effect.

Results

Table 1 displays the proportion of adolescents reporting drinker status by race/ethnicity. These drinking rates are consistent with those found in general U.S. youth population samples (Miech et al., 2016). Additionally, one-way ANOVAs revealed no racial/ethnic differences in rate of drinking frequency at any wave.

Trends in alcohol expectancies

Figure 1 displays the results of intercept-only models estimating expectancies from grade 5–10, adjusted for drinking onset. Positive social expectancies increased linearly from 5th to 10th grade by .3 points. The other three domains of alcohol expectancies declined over the 9 waves of data with a small, significant effect. Like Figure 1, Figure 2 displays the results of intercept-only models, but stratified by race, with significant differences based on non-overlapping confidence intervals. African American youth endorsed higher positive social expectancies than White youth in early waves, but these differences converged between 9th and 10th grade (Figure 2A). African Americans also had significantly higher positive social expectancies than Hispanics around spring of 7th grade (e.g., African Americans: $b = 1.78$, 95% CI: 1.73, 1.83; Hispanics: $b = 1.66$, 95% CI: 1.59, 1.72). Regarding wild/crazy expectancies, African American and White youth showed similar trajectories except around fall of 6th grade, during which African Americans showed slightly higher expectancies (e.g., African Americans: $b = 3.07$, 95% CI: 3.02, 3.13; Whites: $b = 2.98$, 95% CI: 2.95, 3.01) (Figure 2B). No other racial/ethnic differences in positive social or wild/crazy expectancies were observed for Hispanic adolescents relative to White or African American adolescents. Regarding negative expectancies, groups' negative arousal (Figure 2C) and sedation/impairment expectancies (Figure 2D) followed similar trajectories over time with no differences between groups.

Time-varying associations with drinking

Figure 3 displays the time-varying associations between each domain of alcohol expectancies and drinking frequency at each wave. The relationship between positive social expectancies and drinking was significant at all waves; however, the strength of this relationship significantly increased overtime, reaching its highest point at 10th grade ($b = .60$, 95% CI: .47, .72). No other domain of alcohol expectancies was significantly associated with drinking frequency among the full sample.

Like Figure 3, Figure 4 displays the time-varying associations of alcohol expectancies with drinking frequency, but stratified by race/ethnicity, with significant differences based on non-overlapping confidence intervals. Regarding the association of positive social expectancies with drinking frequency, the effect was comparable among African American and White youth during early waves, but these effects diverged before 7th grade due to a steeper increase in the effect among Whites (Figure 4A). The effect converged among Whites and African Americans between 9th and 10th grade. There were no differences in this effect between Hispanics and any other group. Regarding the magnitude of this effect, among Whites, positive social expectancies were significantly associated with drinking from grade 6–10, whereas they were significantly associated with drinking among African Americans only after fall of 8th grade and were never significantly associated with drinking among Hispanics. Regarding the association of wild/crazy expectancies with drinking frequency, no racial differences were observed (Figure 4B). However, wild/crazy expectancies were significantly associated with drinking frequency only among White youth (during grades 9–10), but not African American or Hispanic youth. Regarding the effects of negative arousal (Figure 4C) and sedation/impairment expectancies (Figure 4D), there were no racial/ethnic differences over time. Negative arousal expectancies also were not associated with drinking frequency at any time among any group. However, sedation/impairment expectancies were significantly related to less frequent drinking among Hispanic youth around fall of 7th grade.

Discussion

The current study examined trajectories of alcohol expectancies and their relationships with adolescent drinking over time among a diverse sample of adolescents. Gaining understanding of risk and protective factors for adolescent drinking is important given the association between adolescent drinking and substance-related problems during adulthood, including risk for substance use disorders (DeWit et al., 2000; Gruber et al., 1996). We also examined these trajectories by race/ethnicity among White, African American, and Hispanic youth, given evidence that the prevalence of substance-related problems disproportionately affect African American and Hispanic populations (Witbrodt, Mulia, Zemore, & Kerr, 2014; Zapolski, Pedersen, McCarthy, & Smith, 2014).

As documented by other studies (Dunn & Goldman, 1996; Dunn & Goldman, 2000; Settles et al., 2014), we found a linear increase in one domain of positive alcohol expectancies (positive social expectancies) over adolescence and a slight decrease in the other domain of positive expectancies (wild/crazy expectancies) and in negative alcohol expectancies (i.e., sedation/impairment and negative arousal) from 5th grade to 10th grade. However, these

trajectories differed by race/ethnicity. African American youth endorsed higher positive social alcohol expectancies during middle school years relative to their White peers with the groups converging during high school years. This finding is consistent with previous evidence by Chung et al. (2008) and Hipwell et al. (2005), indicating that racial differences in positive alcohol expectancies changes as a function of time. As for Hispanic youth, although previous literature on the topic is sparse, our findings of no differences in alcohol expectancies relative to other groups, is also consistent with some of the previous literature (Bekman et al., 2011b; Meier et al., 2007; Shih et al., 2010). This provides further support that racial/ethnic differences are present in relation to endorsement of expectancies, with higher levels of positive expectancies for African American youth in comparison to White and Hispanic youth.

However, we did not find evidence that these higher levels of positive expectancies among African Americans translated to higher for alcohol use. Although African Americans reported higher levels of positive alcohol expectancies from 5th to 9th grade, the relationship between positive alcohol expectancies and alcohol use was similar to that of White youth during middle school and *weaker* than that of White youth during high school suggesting positive expectancies posed *less* drinking risk among African Americans. Moreover, although no differences were observed between Hispanic youth and the other racial/ethnic groups, positive alcohol expectancies were not associated with drinking risk at any wave among this group. Moreover, Hispanic youth were the only group for which negative alcohol expectancies were found to be related to decreased drinking. Taken together, these results suggest differential processes influence alcohol risk among Hispanic youth relative to White and African American youth.

These findings have important implications for intervention programing, suggesting that although interventions geared towards addressing positive alcohol expectancies may be best implemented during early adolescence (Weinstein, Lisman, & Johnson, 2015), the impact may not be as strong for African American youth. Specifically, our data suggested that the relationship between alcohol expectancies and drinking converge with that among White youth by 10th grade, indicating that for African American youth, targeting positive social expectancies may be more effective during high school than middle school. Regarding Hispanic youth, no effect was found for positive expectancies, suggesting that this may not be an effective intervention target. However, an effect was observed for negative alcohol expectancies, suggesting that interventions geared at increasing negative alcohol expectancies, may be effective for Hispanic youth, although the developmental period for effectiveness may be narrow based on our data. Given these findings, it is plausible that addressing other factors that are culturally relevant to African American and Hispanic youth may produce stronger effects on decreasing alcohol use risk than what has been found for alcohol expectancies. For example, ethnic identity has been found not only to predict decreases in alcohol use beyond the effects of alcohol expectancies (Scheier, Botvin, Diaz, & Ifill-Williams, 1997), but also to buffer the effect of expectancies on alcohol use among racial/ethnic minority youth (Scheier et al., 1997). Additionally, among African American youth, racial discrimination has been shown to be a strong predictor of drinking (Fuller-Rowell et al., 2012). As such, these factors may prove to be better targets for alcohol prevention among racial/ethnic minority youth than alcohol expectancies.

The limitations of this study should be considered when interpreting its findings. Firstly, because alcohol expectancies and drinking were based on self-report and assessed simultaneously, we cannot make inferences about the direction of this relationship. Secondly, the unequal spacing of assessments, with Waves 1–7 being closer in time (every semester) than Waves 8–9 (every year), created a higher density of observations during the middle school years, which may have resulted in tighter confidence intervals and increased statistical power during this time. Power to detect effects within-race/ethnicity was also increased among White youth relative to African American and Hispanic youth due to differences in subsample sizes. The confidence interval estimates for Hispanic youth in particular were large relative to those of the other groups and may explain the fluctuation in the relationship between positive social expectancies and drinking among this group. Thus, additional caution should be taken when interpreting the findings for this group. Relatedly, the relationship between alcohol expectancies and alcohol outcomes may vary among Hispanic youth based on their subgroup identification (e.g., Puerto Rican, Cuban, Mexican, etc.) or time in the United States (i.e., first versus second generation immigrant). The current data did not provide information on subgroup identification, which will be important to examine in future studies. Finally, the current study extended only through 10th grade, precluding us from examining associations of expectancies and drinking through the end of adolescence (approximately age 19 according to the World Health Organization). As positive social and wild/crazy expectancies, and their associations with drinking, tended to reach their highest levels in the current study at wave 9, it is likely that further observations would reveal further increases in these associations. Thus, prospective research examining these associations with a denser sampling of waves in high school is needed.

In summary, the dynamic endorsement of positive and negative alcohol expectancies, and their associations with drinking vary across adolescence and by race/ethnicity. The influence of both expectancy domains appear more robust for White adolescents in general, and may be a less impactful intervention target for African American and Hispanic youth. Future research should examine the relationship beteewen alcohol expectancies and cultural factors to better predict and prevent drinking risk among racial/ethnic minority groups and the incorporation of these factors in intervention programing.

Acknowledgments

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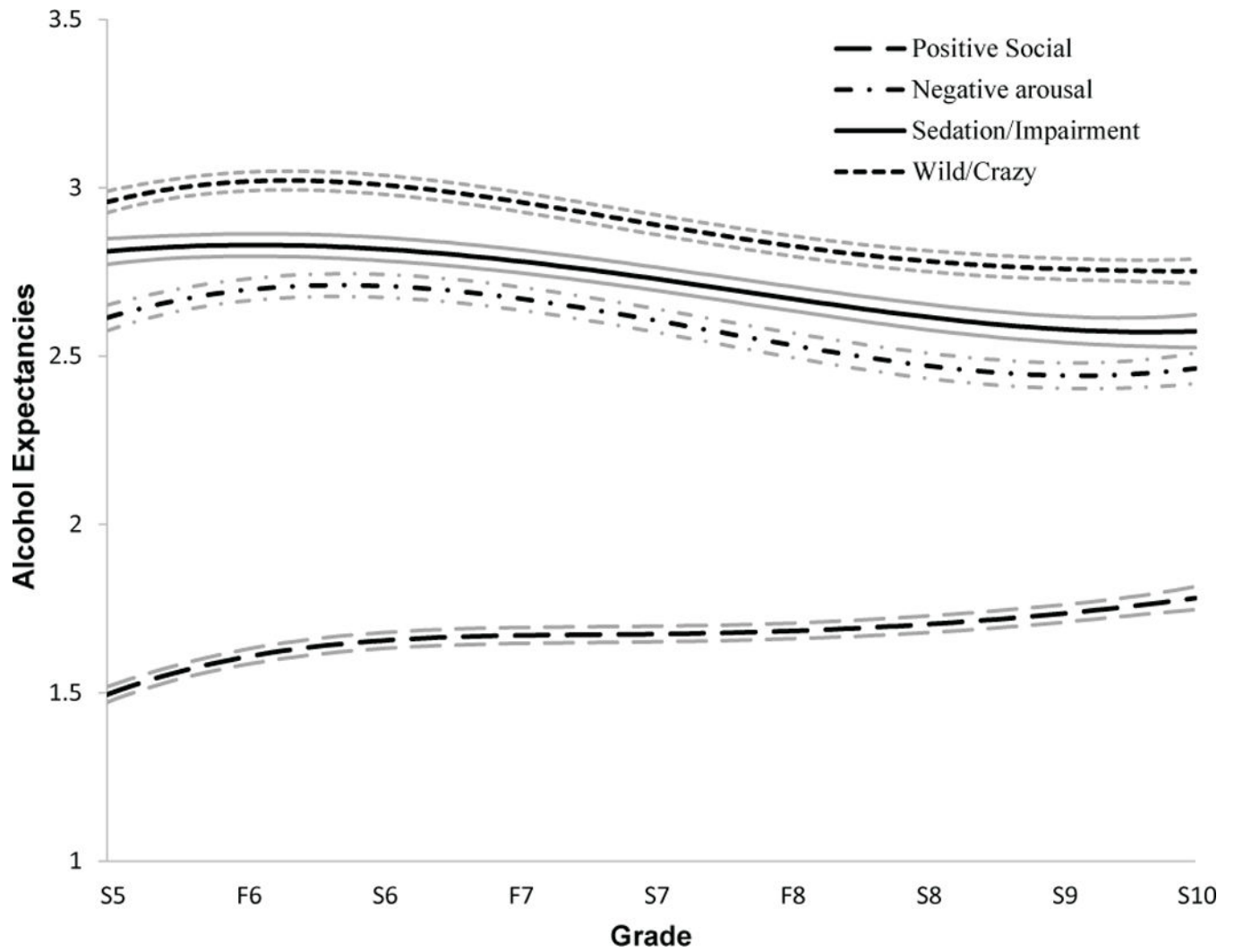
Fig 1.
The value of each domain of alcohol expectancies from grades 5–10 as estimated by an intercept-only TVEM. S represents the estimate during the spring of that grade and F represents the estimate during the fall of that grade. Gray lines indicate 95% confidence intervals. All estimates control for gender, and drinking status.
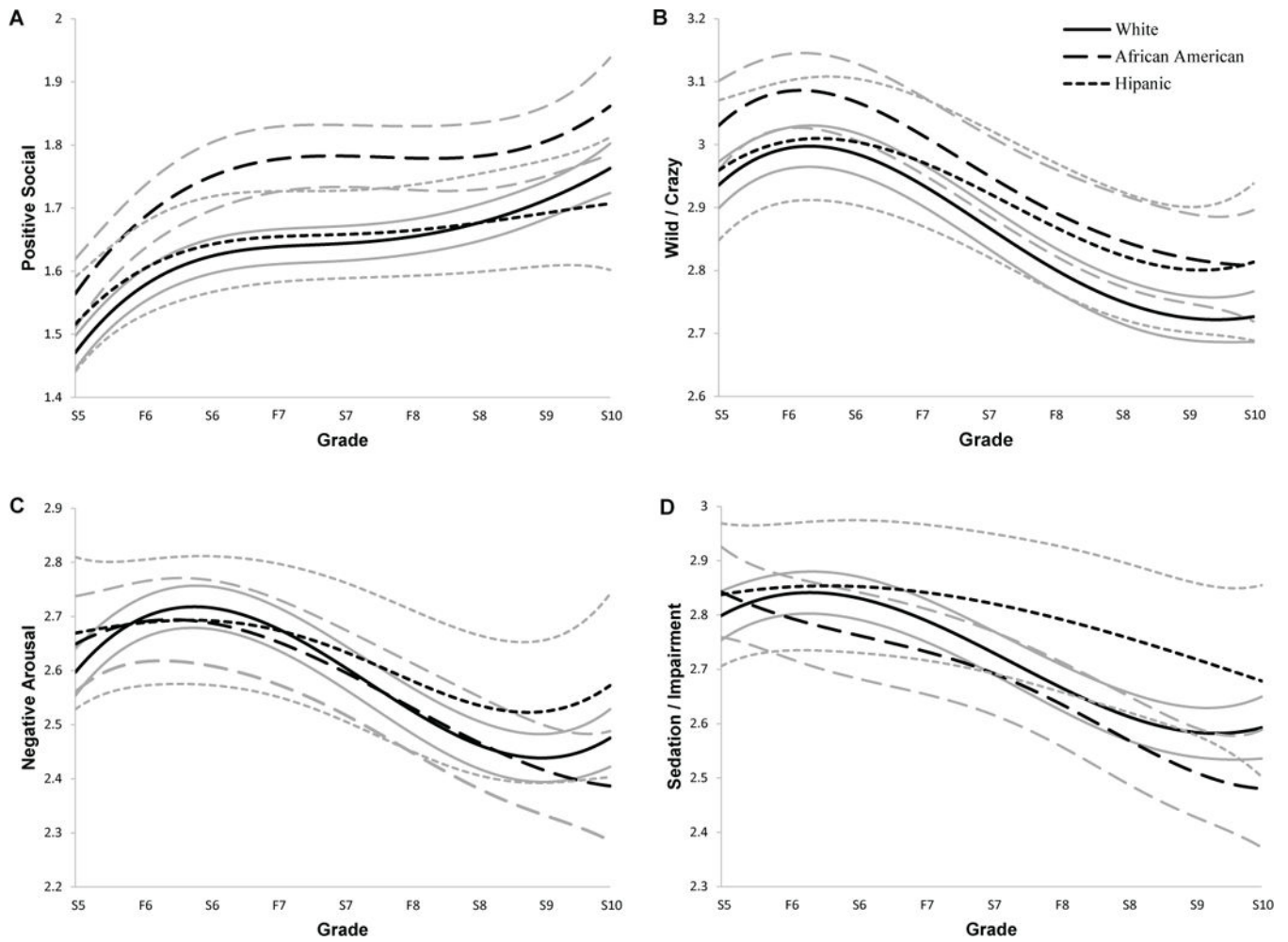
Fig 2.
The value of each domain of alcohol expectancies from grades 5–10 as estimated by an intercept-only TVEM, stratified by race/ethnicity. S represents the estimate during the spring of that grade and F represents the estimate during the fall of that grade. Gray lines indicate 95% confidence intervals. All estimates control for gender, and drinking status.
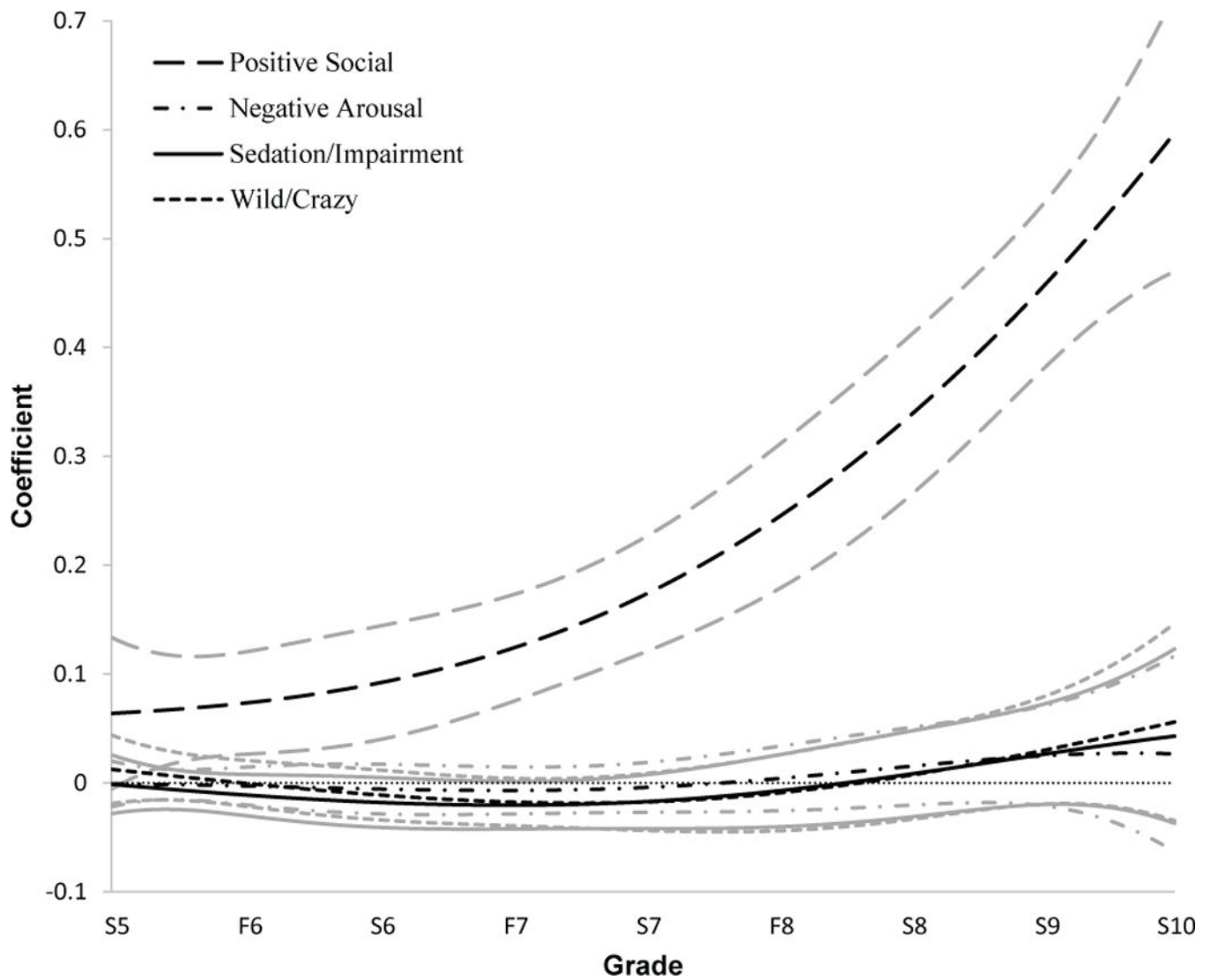
Fig 3.
The estimated time-varying effect of positive (A) and negative (B) alcohol expectancies on drinking status from grades 5–10. S represents the estimate during the spring of that grade and F represents the estimate during the fall of that grade. Gray lines indicate 95% confidence intervals. All estimates control for gender, pubertal status, and drinking status.
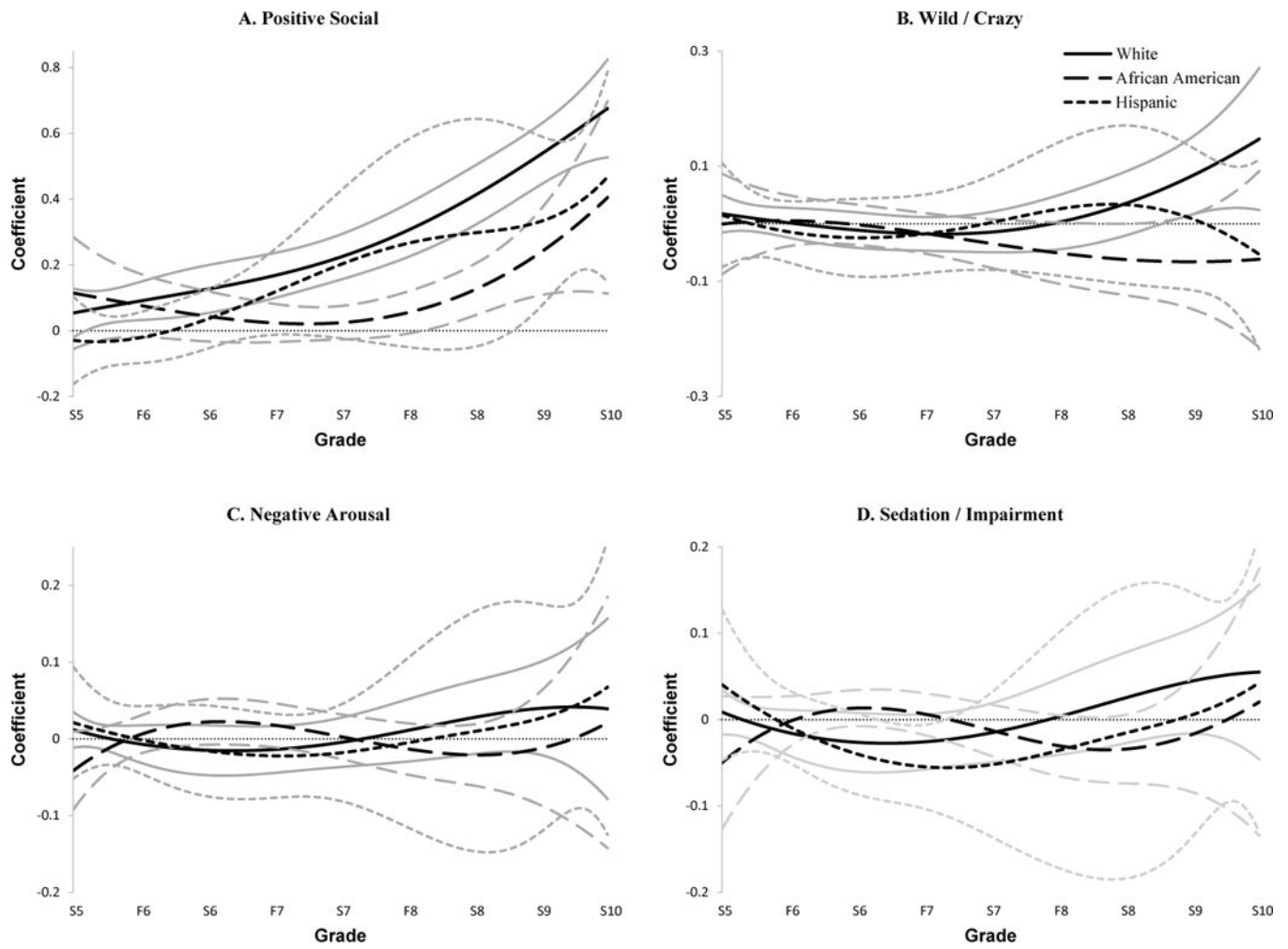
Fig 4.
The estimated time-varying effect of each domain of alcohol expectancies on drinking status from grades 5–10 stratified by race. S represents the estimate during the spring of that grade and F represents the estimate during the fall of that grade. Gray lines indicate 95% confidence intervals. All estimates control for gender, pubertal status, and drinking status.

Table 1

Percentage of adolescents reporting any alcohol use by wave and race/ethnicity

	Grade								
	S5	**F6**	**S6**	**F7**	**S7**	**F8**	**S8**	**S9**	**S10**
White	12.6	12.0	15.2	17.4	21.9	31.0	32.6	48.7	55.1
African American	13.4	10.7	12.9	17.8	20.9	30.1	30.7	41.4	48.5
Hispanic	16.1	14.7	20.3	22.3	25.9	39.2	30.8	49.7	58.0
Total	13.15	12.0	15.2	18.0	22.1	31.5	32.0	47.3	53.9

Note. S represents the spring of that grade and F represents the fall of that grade.