A Longitudinal Study of Alcohol and Cannabis Use in Young Adulthood: Exploring Racial and Ethnic Differences in the Effects of Peer and Parental Influences From Middle Adolescence

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ABSTRACT. Objective: This study assessed how changes from middle adolescence to young adulthood in peer and parental influences relate to frequency of alcohol and cannabis use in young adulthood and evaluated the differences between three racial/ethnic groups. Method: The analytic sample (n = 2,808; 52.9% female; 54% Hispanic, 22.9% White, 23.1% Asian/Pacific Islander) was derived from a longitudinal cohort initially recruited from 16 middle schools in Southern California who completed annual surveys. Data were collected across six waves beginning in Spring 2013 (mean age = 16.2) through Spring 2019 (mean age = 21.6). Results: Multigroup latent growth models revealed consistent increases during adolescence and young adulthood in perceived peer and parental approval of alcohol and cannabis and in the amount of time spent around peers who used these substances. After we controlled for prior use, these increases related to alcohol and cannabis use at age 21, with few exceptions. The time spent around peers most strongly influenced later cannabis use for Hispanic young adults, whereas the influence of peer approval on later alcohol and cannabis use, and parental approval on later alcohol use, was strongest among White young adults. Conclusions: The frequency of alcohol and cannabis use in young adulthood was shaped, in part, from increases in direct and indirect peer influence and perceived parental approval of substance use across two important developmental periods. The findings highlight the importance of early and sustained intervention efforts targeting these social influences, especially among White adolescents, which may potentially decrease alcohol and cannabis use as youth enter young adulthood. (J. Stud. Alcohol Drugs, 83, 684–694, 2022)

ADOLESCENCE AND YOUNG ADULTHOOD are characterized by developmental, environmental, and social changes that shape substance use initiation and continuation (Fagan & Najman, 2005; Melendro et al., 2020; Schulenberg & Maggs, 2002; Wood et al., 2018). The Monitoring the Future study (National Institute on Drug Abuse, 2020) found that 41% and 28% of 10th graders and 55% and 35% of 12th graders reported past-year alcohol or cannabis use, respectively. Among young adults (ages 18–25), 72% and 35% reported past-year alcohol or cannabis use, respectively (Substance Abuse and Mental Health Services Administration, 2019). Cannabis use prevalence has steadily increased among adolescents and young adults since 2002 (Odani et al., 2019).

The social–ecological approach of Bronfenbrenner (1977) provides a framework for depicting, understanding, and predicting how social contexts (e.g., community, family) influence behaviors such as alcohol and cannabis use. Indeed, prior work has noted how levels of one's ecology may affect substance use (for review, see Trucco et al., 2020). However, few studies have examined longitudinally how changes in social contexts may confer greater risk for later substance use. The current study focused on two levels of social ecology, parents and peers, as we assessed how changes from middle adolescence to young adulthood in perceived peer approval, time spent around peers who use substances, and perceived parental approval influence the frequency of alcohol and cannabis use in young adulthood. We further examined racial/ethnic differences in these associations to help provide a better understanding of how peer and parental factors may vary during this developmental period among these different groups, and how they may differentially relate to alcohol and cannabis use. This information could help clinicians and providers better understand where to target prevention and intervention efforts.

Peer influence across developmental periods

Social learning theory asserts that young people affiliating with deviant peers often imitate problem behaviors (Petraitis et al., 1995; Svensson, 2003). Thus, adolescents and young adults may be influenced directly by spending time with peers who use substances, indirectly by what they believe peers are doing (descriptive norms), or by peer approval (Blakemore & Mills, 2014; Gardner & Steinberg, 2005). Time spent with peers who use alcohol or cannabis also has been related to increased substance use over time (D'Amico et al., 2020b). Longitudinal and cross-sectional studies have reported strong correlations between descriptive norms and alcohol and cannabis use among adolescents (Goldstick et al., 2018; Salvy et al., 2014; Tsakpinoglou & Poulin, 2017; Tucker et al., 2014) and young adults (Broadwater et al., 2006; Monk & Heim, 2014; Napper et al., 2016; Patrick et al., 2016; Pearson et al., 2018; Perkins, 2003). Similarly, cross-sectional research has shown a positive association between perceived peer approval and adolescents' own alcohol and cannabis use among adolescents (Pedersen et al., 2017; Stoddard & Pierce, 2018) and college students (Buckner, 2013; LaBrie et al., 2010; Neighbors et al., 2008). Longitudinal work has indicated that perceived peer approval (but not descriptive norms) predicts cannabis use 1 year later, both directly and indirectly, through personal attitudes (Napper et al., 2016); peer approval of alcohol use as well has demonstrated a reciprocal relationship with individual alcohol use over the course of a year (Graupensperger et al., 2021).

Parental influence across developmental periods

Parental influence on substance use is also important during adolescence and young adulthood (Pettigrew et al., 2017; Shin & Miller-Day, 2017). Even though peers are highly influential, parents still hold major sway over their children's decisions to use alcohol and cannabis use during adolescence (Lamb & Crano, 2014; Li et al., 2002; Sellers et al., 2018) and young adulthood (LaBrie et al., 2011, 2016). For example, parental attitudes toward alcohol directly predict drinking during adolescence and the transition into college (Turrisi et al., 2001). In a longitudinal study by Walls et al. (2009), perceived parental disapproval of heavy drinking was related to slowing escalation of alcohol consumption and consequences among college students.

Racial and ethnic group differences

Influences from peers and family must be considered alongside racial/ethnic differences, particularly as racial and ethnic minority youth report greater problems from substance use even when using at similar levels as non-Hispanic White youth (D'Amico et al., 2016; Dunbar et al., 2018). In addition, despite Asian and Hispanic youth historically reporting lower rates of alcohol and cannabis use compared with White youth (Wallace et al., 2002, 2003), recent nationally representative data generally report equivalent rates of alcohol and cannabis use among White and Hispanic youth, although both are still higher than Asian youth (Lee et al., 2021; Terry-McElrath & Patrick, 2020). A number of different modifiable factors have been found to partially explain racial/ethnic differences in substance use among young people, such as individual beliefs, family or cultural factors (Oei & Jardim, 2007; Shih et al., 2010; Unger et al., 2002), peer use at school (D'Amico et al., 2001; Ellickson et al., 2003; Shih et al., 2010), and risk-taking propensity (Collado et al., 2017). Consistent with a social-ecological perspective (Bronfenbrenner, 1977), different groups within one's immediate social context (i.e., parents in the home, peer groups) can exert varying degrees of influence on youth. Understanding which contexts and groups are most important for which youth can assist in the development of targeted prevention programming during critical developmental stages.

For example, high parental respect is a value frequently associated with Asian culture (Unger et al., 2002) and associated with lower substance use (Shih et al., 2010; Unger et al., 2002), whereas a greater parent–child discrepancy in acculturation is a risk factor for substance use among Hispanic adolescents (Unger et al., 2009). Non-Hispanic White youth demonstrate a higher propensity for sensation-seeking and risk-taking relative to racial minority youth (Collado et al., 2017) and may thus be more susceptible to peer influences. Although research is lacking regarding racial/ethnic differences in the association between important others' approval and alcohol and cannabis use among young adults, longitudinal studies from senior year of high school to early college suggest that peer influences are stronger among non-Hispanic White students (Stappenbeck et al., 2010), whereas family influences may be more salient for Hispanic and Asian students (Vaughan et al., 2009). It is important to deepen our understanding of racial/ethnic differences in risk and protective factors associated with use across developmental transitions as findings could help providers better address substance use for all youth.

Current study

The literature on the role of perceived approval in alcohol and cannabis use among young people has been limited by cross-sectional designs or short periods of longitudinal assessment, which do not adequately capture the dynamic process of peer and parental influences throughout adolescence. In addition, studies tend to focus on either peers or parents, alcohol or cannabis, direct or indirect influences, or on only one developmental period. Further, few studies have examined racial/ethnic differences in how such factors may influence use. The current study is the first to examine how direct and indirect peer influence, as well as indirect parental

influence, change over a 6-year period from middle adolescence to young adulthood, how these changes relate to the frequency of alcohol and cannabis use in young adulthood (age 21), and whether there are differences by race/ethnicity. Methodologically, we used a multigroup latent growth model approach to allow for meaningful cross-racial/ethnic group differences in socialization patterns to emerge. Findings that arise using this approach within the multiyear longitudinal design may help guide data-driven, culturally informed prevention and treatment initiatives during early influential developmental periods. Guided by previous research, we expected increases over time in youths' perceived peer and parental approval of alcohol and cannabis use, along with time spent with peers who use these substances, and that increases would be associated with higher frequency of alcohol and cannabis use in young adulthood. We further anticipated that direct and indirect peer influence would be more pronounced among non-Hispanic White youth relative to Asian and Hispanic youth, whereas parental approval would be more influential for Asian and Hispanic youth relative to non-Hispanic White youth.

Method

Sample and procedures

Our sample comprised participants from a longitudinal cohort recruited from 16 middle schools in Southern California to evaluate a substance use prevention program, CHOICE (D'Amico et al. 2012). All participants consented to the study, materials and procedures were approved by the study's institutional review board, and a Certificate of Confidentiality was obtained from the National Institutes of Health. Schools were selected to participate across three districts to obtain a diverse sample. Study procedures are reported in detail elsewhere (D'Amico et al., 2012). In brief, the study began in 2008, enrolling sixth and seventh graders. Follow-up rates during the five surveys in middle school ranged from 74% to 90%. When adolescents transitioned to more than 200 high schools, they were re-contacted and re-consented to complete annual web-based surveys, receiving $50 for each survey, with 61% of the sample participating in Wave 6 (Spring 2013–Spring 2014). Follow-up rates for web-based surveys from Waves 6–11 ranged from 80% to 92%. Participants who did not complete a wave of data collection were still eligible to complete all subsequent waves. The current study reports on data from Wave 6 (Spring 2013–Spring 2014; M_{age} = 16.2), the first survey to include items on perceived parental approval of alcohol and cannabis use, through Wave 11 (Spring 2018–Spring 2019; M_{age} = 21.6), with a final sample of n = 2,808. Alcohol, cannabis, and tobacco use at Wave 10 did not significantly predict retention at Wave 11, similar to previous waves (D'Amico et al., 2018b, 2020b); however, compared with those who did

TABLE 1.	Demographic composition of the study sample

Variable	% (n) or M (SD)
Age, in years	21.6 (0.77)
Female	52.9% (n = 1,486)
Race/ethnicity	
White	22.9% (n = 644)
Hispanic	52.5% (n = 1,516)
Asian	23.1% (n = 648)
Mother's education	
High school or less	39.5% (n = 1,110)
Some college	12.4% (n = 348)
College degree	48.1% (n = 1,350)

not complete Wave 11, retained participants were slightly more likely to be female (94% vs. 91%) and tended to be slightly younger at Wave 10 (M = 20.6 years vs. 20.9 years). Although these are statistically significant differences, they are very small differences (i.e., 3% and 0.3 years). Table 1 provides the demographic composition of the study sample.

Measures

Demographics. Participants self-reported age, gender, race/ethnicity, and mother's education as a proxy for family socioeconomic status (Korupp et al., 2002). Race and ethnicity were assessed separately, and participants were classified into one of five subgroups: non-Hispanic White (hereafter referred to as "White"), Hispanic, Asian, Black, and multiracial/other. Analyses were restricted to the first three subgroups, given the small number of participants who identified as Black or multiracial/other.

Substance use frequency. Alcohol and cannabis use at Wave 11 were assessed by asking "During the past month, how many days did you [drink at least one full drink of alcohol] [use cannabis]?" (Johnston et al., 2018). Response options ranged from 0 to 30 days.

Peer influence. Time spent around peers who use substances was assessed in Waves 6–11 by asking how often they were around peers who were [drinking alcohol] [using cannabis], with responses of 1 (*never*), 2 (*hardly ever*), 3 (*sometimes*), or 4 (*often*) (D'Amico et al., 2008). Perceived peer approval was assessed at Waves 6–11 (Ellickson et al., 2003): "If your friends found out that you did the following things sometimes, how do you think they would feel? [Found out that you drank alcohol sometimes?] [Found out that you used cannabis sometimes?]". Response options included 1 (*they would approve or they wouldn't care*) (initially separate response options that were later merged), 2 (*they would disapprove but still be my friend*), or 3 (*they would disapprove and stop being my friend*). Items were reversed scored so higher scores reflect greater approval.

Parental influence. Perceived parental approval was assessed at Waves 6–11 (Ellickson et al., 2003) as follows: "How would your parents (or guardians) feel if they: [Found out that you drank alcohol sometimes?] [Found out that you

used cannabis sometimes?]". Response options ranged from 1 (*not at all upset*) to 4 (*very upset*). Items were reversed scored so higher scores reflect greater approval.

Analytic plan

Means and standard deviations of all study variables were calculated for each annual assessment time point and by racial/ethnic group (Table 2). For each of the six longitudinal measures (i.e., alcohol and cannabis peer approval, parental approval, time spent with peers) from Waves 6 through 11, we estimated a latent growth model (LGM) in a structural equation modeling framework within Mplus Version 8.1 (Muthén & Muthén, 2012–2018), resulting in six distinct models. A conceptual model is displayed in Figure 1. Coefficients for alcohol and cannabis models are presented in Table 3 and Table 4, respectively. We used robust maximum likelihood estimation, which can accommodate missing data, handle nonnormality, and provide unbiased and consistent estimates. In LGM, the model intercept reflects the predicted value of the outcome when the predictor is equal to zero and thus represents a baseline level or initial probability. The slope reflects the rate of change over time. Moreover, this model allows for change (slope), itself, to function as both an outcome and a predictor. Thus, slopes from each model were used to predict alcohol and cannabis use at Wave 11. As a note, we did not find evidence of nonlinearity, and thus models discussed only include intercept and slope growth factors. Each of the six LGMs was evaluated using conventional model fit criteria: chi-square, root mean square error of approximation (RMSEA), and comparative fit index (CFI). To test whether intercepts and slopes significantly differed among racial/ethnic groups, we imposed and tested parameter equality constraints (e.g., parental approval of cannabis slope constrained to be equal between Whites and Hispanics) using the Wald test. Similarly, to determine whether the magnitude of prediction (e.g., slope predicting subsequent use) significantly varied among racial/ethnic groups we imposed and tested equality constraints using the same procedure. All models controlled for the CHOICE intervention status, gender, and mother's education.

Results

Time spent with peers who use alcohol

Time spent with peers who used alcohol increased over time and significantly predicted alcohol use at age 21 across all racial/ethnic groups (χ^2 = 231.289; RMSEA = .028; CFI = .957; standardized root mean residual [SRMR] = .072). At baseline, all racial/ethnic groups reported spending time with peers who used alcohol ($ps < .001$), with White youth spending more time with peers than Hispanic (χ^2 = 14.999, $p < .00001$) and Asian youth (χ^2 = 26.759, $p < .001$), and

Hispanic youth spending more time with peers than Asian youth (χ^2 = 4.873, $p = .027$). With regard to slopes, time spent with peers who used alcohol increased over time for all racial/ethnic groups ($ps < .001$). Compared with Hispanic youth, there was a steeper increase in time spent with peers who use alcohol for White (χ^2 = 7.705, $p = .005$) and Asian (χ^2 = 25.013, $p < .00001$) youth; no differences were found between White and Asian youth. Further, increases in time spent with peers who use alcohol significantly predicted a higher frequency of alcohol use at age 21 for all groups (White: β = .27; Hispanic: β = .24; Asian: β = .31; $ps < .001$); however, the magnitude did not significantly differ among groups.

Time spent with peers who use cannabis

Time spent with peers who used cannabis increased over time and significantly predicted cannabis use at age 21 across all racial/ethnic groups (χ^2 = 205.678; RMSEA = .024; CFI = .964, SRMR = .073). At baseline, all racial/ethnic groups reported spending time with peers who used cannabis ($ps < .001$). Compared with Asian youth, Hispanic (χ^2 = 41.908, $p < .001$) and White (χ^2 = 44.059, $p < .0001$) youth spent more time around peers who used cannabis. With regard to slopes, time spent with peers who used cannabis increased over time for all groups ($ps < .001$). Compared with Hispanic youth, there was a steeper increase in the time spent with peers who use cannabis for White youth (χ^2 = 12.740, $p = .001$) and Asians (χ^2 = 21.501, $p < .001$); no differences were found between White and Asian youth. Further, increases in time spent with peers who use cannabis significantly predicted a higher frequency of cannabis use at age 21 for all groups (White: β = .22; Hispanic: β = .29; Asian: β = .14; $ps < .001$), with the magnitude being significantly greater for Hispanic youth compared with Asian youth (χ^2 = 7.938, $p = .005$).

Perceived peer approval of alcohol use

Perceived peer approval of alcohol use increased over time and significantly predicted alcohol use at age 21 across all racial/ethnic groups (χ^2 = 297.067, $p < .001$; RMSEA = .037; CFI = .925; SRMR = .08). At the baseline assessment, all groups reported peer approval of alcohol use ($ps < .001$). Compared with White youth, both Hispanic (χ^2 = 35.961, $p < .001$) and Asian (χ^2 = 53.476, $p < .001$) youth reported lower peer approval, and peer approval was higher for Hispanic youth than Asian youth (χ^2 = 6.012, $p = .014$). With regard to slopes, peer approval of alcohol use increased over time for White ($p < .001$), Hispanic ($p < .001$), and Asian ($p < .001$) youth. Compared with White youth, there was a steeper increase for Asian (χ^2 = 33.265, $p < .001$) and Hispanic (χ^2 = 4.093, $p = .043$) youth, and perceived approval was higher for Asian compared with Hispanic youth (χ^2 =

TABLE 2.   Means and standard deviations for measures at each annual assessment and by racial/ethnic group

Variable	White M (SD)	Hispanic M (SD)	Asian M (SD)
Time spent with peers who use cannabis[a]			
Wave 6	2.25 (1.12)	2.30 (1.13)	1.84 (0.99)
Wave 7	2.53 (1.14)	2.35 (1.13)	2.07 (1.06)
Wave 8	2.61 (1.11)	2.31 (1.14)	2.17 (1.10)
Wave 9	2.76 (1.11)	2.39 (1.14)	2.36 (1.09)
Wave 10	2.84 (1.11)	2.52 (1.13)	2.40 (1.08)
Wave 11	2.70 (1.06)	2.49 (1.09)	2.38 (1.03)
Time spent with peers who use alcohol[a]			
Wave 6	2.31 (1.11)	2.22 (1.02)	1.98 (1.02)
Wave 7	2.65 (1.22)	2.35 (1.08)	2.29 (1.07)
Wave 8	2.86 (1.03)	2.50 (1.07)	2.59 (1.04)
Wave 9	3.08 (0.97)	2.60 (1.07)	2.85 (0.96)
Wave 10	3.25 (0.84)	2.84 (1.03)	3.00 (0.92)
Wave 11	3.20 (0.86)	2.89 (0.98)	3.02 (0.89)
Peer approval of cannabis use[b]			
Wave 6	2.27 (0.74)	2.18 (0.71)	1.99 (0.69)
Wave 7	2.41 (0.67)	2.35 (0.69)	2.14 (0.68)
Wave 8	2.59 (0.61)	2.43 (0.65)	2.34 (0.66)
Wave 9	2.67 (0.60)	2.50 (0.64)	2.48 (0.64)
Wave 10	2.73 (0.53)	2.60 (0.61)	2.58 (0.60)
Wave 11	2.75 (0.53)	2.63 (0.57)	2.57 (0.60)
Peer approval of alcohol use[b]			
Wave 6	2.46 (0.69)	2.33 (0.65)	2.20 (0.64)
Wave 7	2.56 (0.59)	2.46 (0.65)	2.38 (0.63)
Wave 8	2.77 (0.49)	2.56 (0.59)	2.59 (0.58)
Wave 9	2.83 (0.44)	2.64 (0.57)	2.72 (0.50)
Wave 10	2.88 (0.37)	2.75 (0.52)	2.84 (0.40)
Wave 11	2.89 (0.36)	2.80 (0.46)	2.86 (0.40)
Parental approval of cannabis use[c]			
Wave 6	1.53 (0.88)	1.22 (0.63)	1.21 (0.55)
Wave 7	1.82 (1.04)	1.40 (0.83)	1.37 (0.74)
Wave 8	2.19 (1.13)	1.55 (0.94)	1.56 (0.91)
Wave 9	2.42 (1.14)	1.76 (1.04)	1.67 (0.96)
Wave 10	2.77 (1.11)	2.05 (1.16)	1.95 (1.06)
Wave 11	2.80 (1.11)	2.17 (1.19)	1.20 (1.09)
Parental approval of alcohol use[c]			
Wave 6	1.96 (1.04)	1.53 (0.89)	1.54 (0.84)
Wave 7	2.36 (1.16)	1.82 (1.05)	1.90 (1.07)
Wave 8	2.90 (1.10)	2.14 (1.16)	2.35 (1.16)
Wave 9	3.21 (1.00)	2.46 (1.20)	2.63 (1.16)
Wave 10	3.54 (0.87)	2.93 (1.17)	3.12 (1.10)
Wave 11	3.63 (0.79)	3.08 (1.15)	3.35 (0.99)
Cannabis use frequency Week 11[d]	4.35 (8.50)	3.43 (7.92)	2.50 (6.85)
Alcohol use frequency Week 11[e]	6.0 (6.26)	3.77 (5.53)	3.37 (4.78)

[a]Scores range from 1 (*never*) to 4 (*often*); [b]scores range from 1 (*they would disapprove and stop being my friend*) to 3 (*they would approve or they wouldn't care*); [c]scores range from 1 (*very upset*) to 4 (*not at all upset*); [d]days of use in past month; 31.8% of participants (*n* = 681) reported using cannabis in the past month; [e]days of use in past month; 67.5% of participants (*n* = 1,445) reported using alcohol in the past month.

22.261, $p < .001$). Further, increases in peer approval of alcohol use significantly predicted greater alcohol use frequency at Wave 11 for White ($\beta = .60$ $p < .001$) and Asian ($\beta = .29$, $p = .011$) but not Hispanic ($\beta = .11$, $p = .089$) youth, with the magnitude being significantly greater for White youth compared with Hispanic ($\chi^2 = 9.779$, $p = .002$) and Asian ($\chi^2 = 5.280$, $p = .022$) youth.

Perceived peer approval of cannabis use

Perceived peer approval of cannabis use increased over time and significantly predicted cannabis use at Wave 11 across all racial/ethnic groups ($\chi^2 = 322.700$, $p < .001$; RMSEA = .039; CFI = .918; SRMR = .09). At baseline, all groups reported peer approval of cannabis use (ps < .001). Compared with Asian youth, White ($\chi^2 = 51.242$, $p < .001$) and Hispanic ($\chi^2 = 29.508$, $p < .001$) youth reported greater peer approval of cannabis use at baseline; White youth were higher than Hispanic youth ($\chi^2 = 8.685$, $p = .003$). With regard to slopes, peer approval of cannabis use increased over time for White ($p < .001$), Hispanic ($p < .001$), and Asian ($p < .001$) youth. Further, there was a steeper increase in peer approval of cannabis use for Asian compared with White ($\chi^2 = 8.165$, $p = .004$) and Hispanic ($\chi^2 = 16.878$, p

TABLE 3. Unstandardized coefficients (standard errors) for racial/ethnic groups in alcohol models

Variable	Intercept	Slope	Slope predicting alcohol use
Time spent with peers who use alcohol			
White	2.45 (0.05)***	0.18 (0.01)***	9.46 (2.95)***
Hispanic	2.22 (0.03)***	0.14 (0.01)***	7.39 (1.37)***
Asian	2.10 (0.04)***	0.21 (0.01)***	8.84 (1.91)***
Perceived peer approval			
White	2.56 (0.03)***	0.08 (0.01)***	38.66 (9.25)***
Hispanic	2.36 (0.02)***	0.09 (0.00)***	6.99 (4.11)
Asian	2.28 (0.03)***	0.13 (0.01)***	13.97 (5.46)***
Perceived parental approval			
White	2.10 (0.05)***	0.33 (0.01)***	9.77 (2.36)***
Hispanic	1.52 (0.03)***	0.33 (0.01)***	3.08 (1.14)***
Asian	1.57 (0.04)***	0.37 (0.01)***	3.51 (1.68)*

$*p < .05$; $***p < .001$.

TABLE 4. Unstandardized coefficients (standard errors) for racial/ethnic groups in cannabis models

Variable	Intercept	Slope	Slope predicting cannabis use
Time spent with peers who use cannabis			
White	2.39 (0.05)***	0.09 (0.01)***	9.80 (2.64)***
Hispanic	2.29 (0.03)***	0.04 (0.01)***	12.05 (1.65)***
Asian	1.94 (0.04)***	0.18 (0.01)***	5.14 (1.82)***
Perceived peer approval			
White	2.36 (0.03)***	0.09 (0.01)***	13.45 (5.35)**
Hispanic	2.25 (0.02)***	0.08 (0.01)***	7.81 (3.61)*
Asian	2.05 (0.03)***	0.12 (0.01)***	1.48 (3.09)
Perceived parental approval			
White	1.60 (0.04)***	0.27 (0.01)***	4.62 (2.29)*
Hispanic	1.22 (0.02)***	0.19 (0.01)***	3.97 (1.50)**
Asian	1.22 (0.03)***	0.17 (0.01)***	2.05 (1.86)

$*p < .05$; $**p < .01$; $***p < .001$.

$< .001$) youth. Increases in peer approval of cannabis use significantly predicted a higher frequency of cannabis use at age 21 for White ($\beta = .17$, $p = .012$) and Hispanic ($\beta = .10$, $p = .031$) but not Asian ($\beta = .03$, $p = .633$) youth, with the magnitude being significantly greater for White compared with Asian youth ($\chi^2 = 3.760$, $p = .053$).

Perceived parental approval of alcohol use

Across all racial/ethnic groups, perceived parental approval of alcohol use increased over time and significantly predicted alcohol use at age 21 ($\chi^2 = 379.979$; RMSEA = .05; CFI = .85; SRMR = .09). At baseline, all groups reported parental approval of alcohol use ($ps < .001$). Compared with White youth, initial parental approval of alcohol use was lower for Hispanic ($\chi^2 = 101.742$, $p < .001$) and Asian ($\chi^2 = 69.961$, $p < .001$) youth. There was no baseline difference between Hispanic and Asian youth. With regard to slopes, parental approval of alcohol use increased over time for all groups ($ps < .001$), with a significantly steeper increase for Asian youth compared with Hispanic ($\chi^2 = 10.118$, $p = .0015$) and White ($\chi^2 = 6.131$, $p = .0133$) youth. Further, in-

creases in parental approval over time significantly predicted a higher frequency of alcohol use at age 21 for White ($\beta = .31$, $p < .001$), Hispanic ($\beta = .11$, $p = .007$), and Asian ($\beta = .13$, $p = .037$) youth, with the magnitude of association being stronger for White youth compared with Hispanic ($\chi^2 = 6.517$, $p = .011$) and Asian ($\chi^2 = 4.664$, $p = .031$) youth.

Perceived parental approval of cannabis use

Across all racial/ethnic groups, perceived parental approval of cannabis use increased over time and significantly predicted cannabis use at age 21 ($\chi^2 = 395.01$; RMSEA = .05; CFI = .87; SRMR = .10). At baseline, all groups reported parental approval of cannabis use ($ps < .001$). Compared with White youth, initial parental approval of cannabis use was lower for Hispanic ($\chi^2 = 65.955$, $p = .026$) and Asian ($\chi^2 = 60.469$, $p < .001$) youth; however, there was no difference at baseline between Hispanic and Asian youth. With regard to slopes, parental approval of cannabis use increased over time for all groups ($ps < .001$). Increases in parental approval of cannabis over time were greater for White than Hispanic ($\chi^2 = 30.672$, $p < .001$) and Asian ($\chi^2 = 44.472$, $p < .001$)
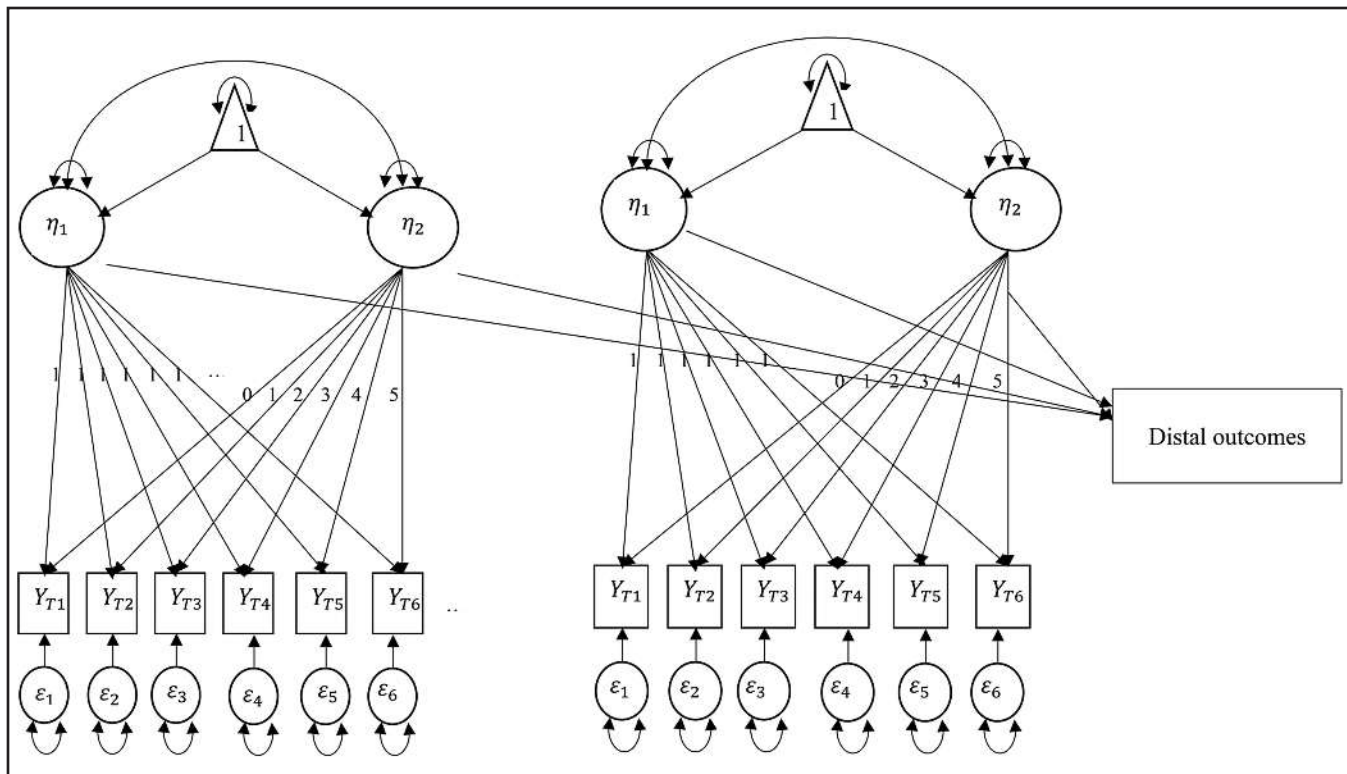
FIGURE 1.   Conceptual model for a multigroup linear latent growth model. Here, the latent means for the intercept and slope as well as the variances for the intercept and slope are group varying. Each intercept and slope is used to predict distal outcomes.

youth and significantly higher for Hispanic than Asian youth ($\chi^2 = 4.245$, $p = .039$). Further, increases in parental approval of cannabis over time significantly predicted a higher frequency of cannabis use at age 21 for White ($\beta = .10$, $p = .044$) and Hispanic ($\beta = .09$, $p = .008$), but not Asian ($\beta = .05$, $p = .270$) youth.

Discussion

This study adds to the literature by documenting racial/ethnic differences in how peer and parental influence from early adolescence to young adulthood affect both alcohol and cannabis use frequency at age 21, controlling for the use of each substance in the year prior, respectively. Across the three racial/ethnic groups examined, we found consistent increases during adolescence and young adulthood in time spent with peers who use alcohol and cannabis and perceived peer and parental approval of using these substances. Increases in parental and peer influence, in turn, significantly predicted a higher frequency of both cannabis and alcohol use at age 21, with the exception of both peer and parental approval not predicting later cannabis use among Asian youth and peer approval not predicting later alcohol use among Hispanic youth. The overall consistency within the six growth models suggests broader rather than more targeted prevention strategies for all youth, specifically addressing

direct and indirect peer influence so teens feel confident that they can resist drinking or using cannabis in different social situations.

However, there were some noteworthy racial/ethnic differences in the strength of associations that warrant further consideration. White and Hispanic youth spent more time with peers who use cannabis and alcohol compared with Asian youth at baseline (age 16), whereas across the transition from adolescence to young adulthood White and Asian youth more than Hispanic youth increased the time spent around peers who used alcohol and cannabis. Increases were associated with higher frequency of cannabis and alcohol use at age 21 across all racial/ethnic groups but were more strongly associated with later alcohol use among Hispanic compared with Asian youth. This highlights that direct peer influence seems to operate more strongly for Hispanic and White youth compared with Asian youth and emphasizes the importance of helping teens, especially Hispanic and White teens, develop skills to resist peer influence during this developmental period, which has been shown to be an effective way to decrease substance use for racially/ethnically diverse groups of adolescents (D'Amico et al., 2012; Ellickson et al., 2003; Hecht et al., 2003; Kulis et al., 2017).

We also evaluated indirect peer influence; that is, how changes in perceived peer approval across adolescence and young adulthood relate to use at age 21. White youth report-

ed higher peer approval of both alcohol and cannabis at age 16 compared with both Asian and Hispanic youth, whereas Hispanic youth reported higher peer approval than Asian youth. This trend almost perfectly reversed over time—peer approval of alcohol and cannabis use increased more rapidly for Asian youth relative to Hispanic and White youth, and more so for Hispanic youth (for alcohol only) relative to White youth. Interestingly, despite steeper increases across adolescence in peer approval among Asian and Hispanic participants, the change was still more strongly associated with higher frequency of alcohol use at age 21 for White young adults compared with Asian and Hispanic young adults, and for White versus Asian young adults with respect to cannabis use frequency.

One possible explanation for these differences is that White youth may be more susceptible to peer group approval of alcohol and cannabis and have greater access to these substances, which may increase their use overall relative to racial minority youth (Collado et al., 2017). Studies have shown that adolescent substance use increases with the permissiveness of social environment characteristics and with increasing perceived availability (Kuntsche et al., 2008; Lee et al., 2021). Furthermore, recent work with nationally representative data shows that White youth perceive greater availability of cannabis compared with Asian youth and that their perceptions are significantly associated with individual use (Lee et al., 2021). In addition to helping teens develop skills to resist direct peer influence, our findings suggest that policymakers and school health educators should find ways to address indirect pressure, in the form of perceived peer approval, in prevention programming for all youth in school environments. Special attention should be given to addressing indirect peer pressure among White youth given that their use of alcohol and cannabis in young adulthood was more strongly predicted by increases in peer approval throughout adolescence than Hispanic and Asian youth.

Perceived parental approval of alcohol and cannabis use also increased over time among Hispanic, White, and Asian youth and was associated with higher frequency of young adulthood alcohol and cannabis use for White and Hispanic young adults, but only for alcohol use among Asian young adults. At baseline, Hispanic and Asian youth reported lower levels of parental approval for both alcohol and cannabis compared with White youth. Over time, Asian youth reported a greater increase in parental approval of alcohol, but a lower increase in parental approval of cannabis, compared with Hispanic and White youth. Similar to findings on peer approval, changes in parental approval across adolescence were more strongly associated with higher frequency of alcohol use at age 21 for White young adults compared with Hispanic and Asian young adults. However, despite White, Hispanic, and Asian youth all reporting significant increases in parental approval of cannabis use across adolescence, these increases only predicted higher frequency of young adult cannabis use among White and Hispanic young adults.

It may be that parents of Asian youth promote unique messages about cannabis use and that the messages have a continued beneficial effect on how their young adult children view and subsequently use cannabis. In addition, and consistent with prior research among middle-school Asian youth (e.g., Shih et al., 2010), high parental respect may continue to serve as a protective factor for older Asian adolescents. For Hispanic youth, the influence of parental approval may, in part, be due to the type of parenting style in the household. In an analysis of Hispanic adolescents derived from nationally representative data, Merianos and colleagues (2020) reported that most authoritative parenting behaviors are associated with decreased cannabis use. Moreover, Hispanic culture places an emphasis on family values, which also acts as a protective factor for adolescent substance use (Merianos et al., 2020). Current findings suggest that prevention programs specifically designed for Hispanic adolescents should consider leveraging these important familial factors by emphasizing parental involvement and incorporating education on how parenting styles are associated with adolescents' cannabis use.

More broadly, intervention programs could benefit by helping parents understand how to better communicate disapproval of underage drinking and cannabis use, and guiding parents on effective strategies for minimizing contexts and social peer groups in which adolescents may be exposed to alcohol and cannabis. Despite parents sometimes feeling incapable of influencing their teen's behavior (Lamb & Crano, 2014), parents have a direct influence on their teen's behaviors during adolescence and beyond (Ryan et al., 2010). For example, educating parents on how to increase monitoring efforts could indirectly reduce cannabis use by reducing the likelihood that alcohol and cannabis are present and/or offered to their teen (Siegel et al., 2015). Research with college populations has shown that greater parental knowledge of their child's whereabouts, activities, and peer associations, especially in the presence of low parental approval of use, is associated with lower drinking (Hummer et al., 2013).

This study has some limitations. With respect to peer and parental approval, it was not possible to evaluate the accuracy of the youth's perceptions. Adolescents may not be accurate when estimating substance use behaviors, whether of unfamiliar peers, classmates, or even close friends (see Prentice, 2008, for a review; Helms, 2014). It would be helpful for future research to determine if the respective influences on outcomes were driven by actual approval or inaccurate perceptions of approval because this could be useful in prevention programming, similar to how programs help adolescents and young adults have a better understanding of substance use behavior among their peers (Cuijpers, 2002; D'Amico et al., 2018a, 2020a; Komro & Toomey, 2002; Spoth et al., 2008). Relatedly, we did not assess identity

of the peer reference group, so we are unable to determine whether peer groups across the transition to young adulthood comprised same or different members. Because effects of changes in perceived approval (slopes) were modeled across a 6-year period, it is not possible to specify at which time point the strongest effects were present. Last, because of small sample size we could not include comparisons with Black youth, a group for whom perceived parental approval has been shown to be influential on drinking trajectories during adolescence (Reboussin et al., 2019).

Despite limitations, the current study highlights the enduring influence of both peers and parents during adolescence and young adulthood on cannabis and alcohol use at age 21. Overall, peer and parental approval of substance use increased throughout adolescence for all Asian, Hispanic, and White youth. With few exceptions, these increases all related to alcohol and cannabis use at age 21, with some racial/ethnic group variation in the magnitude of influence; direct peer influence (i.e., time spent with peers who use) on later cannabis use was strongest among Hispanic young adults, whereas indirect peer influence (i.e., peer approval) on later alcohol and cannabis use, and parental approval on later alcohol use, was strongest among White young adults. Through social comparison and appraisal processes, adolescents come to form an identity, in part, by seeking congruence between their own attitudes, values, and beliefs, and those of important others, which in turn influences an adolescent's sense of self-worth (Felson, 1985; Harter et al., 1996; Helms et al., 2014). Given the centrality of identity and attitude development during the adolescent years, and the significant role of parental and peer approval in that process, early and sustained intervention efforts targeting these sources of influence may help redirect the course of a cannabis or alcohol use trajectory, especially for White adolescents.

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