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Are dimensions of parenting differentially linked to substance use across Caucasian and Asian American college students?

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Abstract

Background—Parental warmth and autonomy granting are commonly thought of as protective factors against substance use among Caucasians. However, limited research has examined whether associations between parenting dimensions and substance use outcomes are the same or different among Asian Americans.

Method—A final analytic sample of 839 college students was used to test whether race (Caucasian vs. Asian American) moderated the relations between parenting dimensions and substance use outcomes across Caucasians and Asian Americans. We utilized the Parental Bonding Instrument (Parker, Tupling, & Brown, 1979) to measure maternal and paternal warmth, encouragement of behavioral freedom, and denial of psychological autonomy.

Results—Multivariate regression models controlling for covariates including age, gender, and paternal education indicated four significant parenting by race interactions on alcohol problems and/or marijuana use. Specifically, maternal warmth was inversely associated with both alcohol problems and marijuana use among Caucasians but not among Asian Americans. Both maternal and paternal denial of psychological autonomy were positively associated with alcohol problems among Caucasians but not among Asian Americans.

Conclusions—Consistent with emerging cross-cultural research, the associations between parenting dimensions and substance use behaviors observed in Caucasian populations may not be readily generalized to Asian Americans. These findings highlight the importance of considering different parenting dimensions in understanding substance use etiology among Asian Americans. Future research should use longitudinal data to replicate these findings across development and seek to identify other parenting dimensions that may be more relevant for Asian American youth.

Keywords

Parental Warmth; Parental Autonomy Granting; Alcohol Problems; Marijuana Use; Asian Americans

Epidemiological data show Asian Americans generally report lower levels of substance use than Caucasians (McCabe et al., 2007; Substance Abuse and Mental Health Services

Administration, 2012). However, problematic alcohol use among Asian American college students has shown increases over time (Grant et al., 2004; Wechsler et al., 2002), with prevalence rates of alcohol and drug use comparable to those reported by other college students in a national sample (So & Wong, 2006). In a nationally representative sample of recent-onset drinkers, Asian Americans and Pacific Islanders as a collective group reported more unsuccessful efforts to quit or cut down drinking than Caucasians (Lee, Rose, Engel-Rebitzer, Selya, & Dierker, 2011). Moreover, Xu and colleagues (2011) found that Asian Americans and Pacific Islanders (combined as a single group) with drug use disorders were more likely to follow a more persistent course over a two year period than their Caucasian counterparts (Xu et al., 2011). Taken together, despite the overall lower substance use prevalence rates, unique challenges are present in the prevention and treatment of substance use and related problems among Asian Americans.

The identification of culturally-specific risk and protective factors associated with substance use among Asian Americans is a critical step towards developing culturally-sensitive interventions. Prior research suggested some correlates of substance use, including family structure (Au & Donaldson, 2000), alcohol expectancies (Hendershot et al., 2009), and peer substance use (Nagasawa, Qian, & Wong, 2000), conferred similar risks across Caucasians and Asian Americans (Hong, Huang, Sabri, & Kim, 2011). Concurrently, culturally-specific correlates of substance use among Asian Americans are present. Acculturation to American culture, for instance, increased risks for substance use among most Asian Americans (Le, Goebert & Wallen, 2009; Thai, Connell, & Tebes, 2010; Willgerodt & Thompson, 2006). Conversely, the *ALDH2*2* allele served as a protective factor against alcohol involvement among some Asian Americans (Eng, Luczak, & Wall, 2007; Luczak, Glatt, & Wall, 2006). However, limited empirical data are available to suggest whether or not substance use interventions targeting contextual factors such as parenting may need to be adapted for Asian Americans. The goal of this study was therefore to systematically examine whether the associations between parenting dimensions and substance use outcomes differed across Caucasian and Asian American college students.

Parenting is a core factor in the socialization process influencing multiple psychosocial outcomes across development. According to Darling and Steinberg's conceptualization (1993), parenting style sets the global emotional climate for specific parenting practices to impact developmental outcomes. In individualistic cultures, parenting involving clear expectations in a warm and supportive way which honors the individuality of their children by granting them autonomy is considered optimal (Maccoby & Martin, 1983). In a three-wave longitudinal study, Baumrind (1991) found parenting encompassing both structure and warmth protected adolescents against substance use behaviors. Subsequent research indicates parental warmth and autonomy granting are both independently associated with reduced risks for substance use (Barnow, Schuckit, Lucht, John, & Freyberger, 2002; Mounts, 2004; Patock-Peckham, Cheong, Balhorn, & Nagoshi, 2001).

Unlike Caucasian parents who tend to endorse individualistic parenting styles, Asian American parents residing in the United States may tend to endorse collectivistic parenting, which could lead to intergenerational conflict with their second generation offspring and increase substance use risk (Bhattacharya, 1998). Less optimal parenting in individualistic

cultures entails expecting children to obey a set of rules without much explanation or the expression of emotional support. Nevertheless, parents in collectivistic Asian cultures who demonstrate high adherence to family values are more likely to utilize a rule driven but low warmth approach (Park, Kim, Chiang, & Ju, 2010). Moreover, while holding unyielding rules is considered to be a less desired parenting approach in individualistic cultures, it was associated with beneficial effects on academic and social adjustment among individuals of Asian descent (Ang, 2006; Li, Costanzo, & Putallaz, 2010; Leung, Lau, & Lam, 1998). Taken together, these findings are consistent with the notion that parental warmth and control may play a different role in individualistic versus collectivistic cultures (Dwairy, 2010; Russell, Crockett, & Chao, 2010).

Although there is a theoretical basis for potential cross-cultural moderation effects, few studies have examined whether the associations between parenting dimensions and substance use outcomes differ across Caucasians and Asian Americans. In their recent review, Wang, Kviz, and Miller (2012) suggested parent-child bonding can act as the mediator between cultural-based risk factors (e.g., acculturation and intergenerational cultural dissonance) and alcohol abuse among Asian American youth and serve as an important target for intervention. Hahm, Lahiff, and Guterman (2003) also demonstrated that parental attachment acted as a buffer in the association between acculturation and alcohol use in a national sample of Asian American adolescents, such that acculturation was positively linked to alcohol use only at low levels of parental attachment. These studies point to the critical role of parenting in the etiology of substance use among Asian Americans. However, these studies were limited in two ways. First, parenting was measured as a global construct rather than specific dimensions such as parental warmth or parental autonomy granting. Second, these studies were conducted among Asian Americans only and did not include a Caucasian counterpart. As existing family-based substance use interventions are designed primarily based on parenting literature developed in Western populations (e.g., Giannotta, Ortega, & Stattin, 2013; Sanders, 2000), it is critical to assess the degree to which the associations between parenting and substance use are generalizable from Caucasians to Asian Americans in the first place.

To our knowledge, the current study is the first to test whether different dimensions of parenting are differentially associated with substance use outcomes across Caucasians and Asian Americans. Utilizing the Parental Bonding Instrument (Parker et al., 1979), we focused on three parenting dimensions found in prior factor analyses (Cox, Enns, & Clara, 2000; Kendler, Sham, & MacLean, 1997; Murphy, Brewin, & Silka, 1997). We conducted four multivariate regression models, stratified by paternal and maternal parenting, to test whether the associations between parenting dimensions (i.e., parental warmth, encouragement of behavioral freedom, and denial of psychological autonomy) and substance use outcomes (i.e., alcohol problems and marijuana use) were moderated by race after controlling for relevant covariates. We hypothesized parental warmth would have a stronger inverse association with substance use for Caucasians than for Asian Americans. Similarly, we hypothesized parental denial of psychological autonomy would have a stronger positive association with substance use among Caucasians than for Asian Americans. We expected no cross-cultural moderation for the association between parental encouragement of behavioral freedom and substance use across race.

Method

Participants

We collected data from a sample of 940 college students who took undergraduate psychology courses at a large public university. One hundred and one participants who endorsed a racial/ethnic group other than Caucasian or Asian/Pacific Islander (10.74%) were excluded from the current analyses. The final analytic sample ($n = 839$) included 550 Caucasians and 289 Asians/Pacific Islanders. Participants were first presented with information about the study by a research assistant and were asked to provide informed consent. Participants who gave consent then completed an in-person computerized survey and received course credit for their participation. This study went through human subject review and was approved by the university's Institutional Review Board.

Measures

Demographic Variables—Participants reported on their age, gender, and paternal education. Response options for age ranged from 18 to 24 years old. Paternal education was used as a proxy for socioeconomic background and was coded on a scale from 0 = 8th grade or less to 10 = Graduate/professional degree (King, Karyadi, Luk, & Patock-Peckham, 2011).

Parenting—The Parental Bonding Instrument (PBI; Parker et al., 1979) is a well validated measure of retrospective report of participants' perceived parenting behaviors in their first 16 years of life. Parallel items were used to assess maternal and paternal parenting behaviors separately (25 items per parent), adding up to a total of 50 items. The response options for these items were 0 = very like, 1 = moderately like, 2 = moderately unlike, and 3 = very unlike. A fifth response option, no mother or no father, was included and was coded as missing data in the current analyses. We computed three parenting subscales based on factor analyses showing superior model fit with a three-factor structure than the original two-factor structure (Cox, et al., 2000; Kendler et al., 1997; Murphy et al., 1997). Given that parental denial of psychological autonomy was scored in the opposite direction to the other two parenting subscales, Cronbach's alphas were reported for each subscale rather than for the overall scale. Reliability analyses conducted by Murphy and colleagues (1997) indicated that alphas for maternal care (warmth in this study), encouragement of behavioral freedom, and denial of psychological autonomy were .90, .81 and .78; alphas for paternal care (warmth in this study), encouragement of behavioral freedom, and denial of psychological autonomy were .92, .88 and .78.

Parental Warmth: Parental warmth reflects a positive and nurturing parent-child relationship in which the parent is understanding and emotionally supportive. This parenting dimension was measured using the PBI parental care subscale (12 items). Six items were reverse coded such that a higher score represented a higher level of parental warmth. Sample items included “spoke to me in a warm and friendly voice” and “did not seem to understand what I needed or wanted” (reverse coded). Cronbach's alphas for maternal care were .91 for Caucasians and .87 for Asian Americans. Cronbach's alphas for paternal care were .92 for Caucasians and .91 for Asian Americans.

Parental Encouragement of Behavioral Freedom: Parental encouragement of behavioral freedom reflects the degree to which the parent allows the child to make his/her own decisions and choose what he/she wants. This parenting dimension was measured using 6 items from the PBI parental overprotection subscale. A higher score represented a higher level of parental encouragement of behavioral freedom. Sample items included “let me do those things I liked doing” and “let me decide things for myself”. Cronbach's alphas for maternal encouragement of behavioral freedom were .84 for Caucasians and .86 for Asian Americans. Cronbach's alphas for paternal encouragement of behavioral freedom were .80 for Caucasians and .84 for Asian Americans.

Parental Denial of Psychological Autonomy: Parental denial of psychological autonomy reflects intrusive parenting, overprotectiveness, discouragement of independence and maturation, and can be conceptualized as the lack of autonomy granting. This parenting dimension was measured using 7 items from the PBI parental overprotection subscale. A higher score represented a higher level of parental denial of psychological autonomy. Sample items included “tended to baby me,” “tried to make me feel dependent on him/her” and “tried to control everything I did”. Cronbach's alphas for maternal denial of psychological autonomy were .82 for Caucasians and .77 for Asian Americans. Cronbach's alphas for paternal denial of psychological autonomy were .74 for Caucasians and .75 for Asian Americans.

Alcohol Use—Frequency and quantity of past year alcohol use were assessed using four self-reported items. The response options for the two frequency items (one for beer/wine and one for hard liquor ranged) from (1) “not at all” to (7) “every day.” The response options for the two quantity items (one for beer/wine and one for hard liquor) ranged from (1) “No drinks” to (9) “nine or more drinks” per occasion. We computed the sum of the products of the beer/wine quantity*frequency and the hard liquor quantity*frequency to represent past year alcohol use, and then centered the variable such that 0 indicated no alcohol use at all in the past year.

Alcohol Problems—Frequency of past year alcohol related negative consequences was assessed using 39 items, with 27 items derived from the Young Adult Alcohol Problems Screening Test (Cronbach's alpha for past year alcohol problems in the original study = .83; Hurlburt & Sher, 1992) and 12 items taken from Mallett, Bachrach, and Turrissi (2008; Cronbach's alpha was not available in the original study). Sample items included “Have you ever urinated on yourself because of your drinking?” and “Have you felt very sick to your stomach or thrown up after drinking?” Response options ranged from (0) “Never or Not in the Past Year” to (1) “1 time in the past year” to (8) “40 or more times in the past year.” A mean of all items was taken for this variable. The Cronbach's alphas for alcohol problems were .93 for Caucasians and .91 for Asian Americans.

Marijuana Use—The frequency of past year marijuana use was assessed using a single item, “In the past year, how many times did you use marijuana or hashish?” The response options ranged from (0) “Not at all” to (1) “once a month” to (2) “2-3 times per month” to (6) “Every day.”

Analytic Strategy

We conducted all analyses using SPSS 21.0. First, we obtained descriptive statistics on demographic, parenting and substance use variables, and tested whether these variables differed across Caucasians and Asian Americans. Next, we computed bivariate correlations among parenting and substance use variables for the Caucasian and Asian American groups separately. Then, we tested whether race moderated the associations between parenting dimensions and alcohol problems using multivariate regression models, with age, gender, paternal education and alcohol use treated as covariates. Similarly, we tested whether race moderated the associations between dimensions of parenting and marijuana use after controlling for age, gender, and paternal education. Because analyses were conducted separately for maternal and paternal parenting, we ran a total of four multivariate regression models.

To test moderated effects, we mean-centered all parenting dimensions and coded race as Caucasian = 0 and Asian American = 1. For each multivariate regression model, we first included all the covariates, predictors, and parenting dimension by race interaction terms in the initial model. We then trimmed each model by removing non-significant interaction terms from the final multivariate regression model. Finally, we probed significant interactions using simple slope analyses following Aiken and West (1991).

Results

Descriptive Statistics

Table 1 presents means and standard deviations of study variables for the entire sample and by race. *T*-tests revealed mean differences in all dimensions of parenting and substance use outcomes across race. Asian Americans reported lower levels of parental warmth and encouragement of behavioral freedom but higher levels of parental denial of psychological autonomy than Caucasians. Asian Americans reported lower levels of alcohol use, alcohol problems and marijuana use than Caucasians. Table 2 shows the bivariate correlations among parenting and substance use variables by race.

Multivariate Regression Models

Table 3 presents results from four multivariate regression models. Figures 1 and 2 illustrate the significant interaction effects.

Maternal parenting and alcohol problems by race—After controlling for age, gender, paternal education and alcohol use, we found a significant interaction effect between maternal warmth and race on alcohol problems ($\beta = .059, p = .022$) and another significant interaction effect between maternal denial of psychological autonomy on alcohol problems ($\beta = -.052, p = .036$). Simple slope analyses indicated maternal warmth was protective against alcohol problems among Caucasians ($\beta = -.105, p < .001$) but not among Asian Americans ($\beta = -.004, p = .901$), whereas maternal denial of psychological autonomy was a risk factor for alcohol problems among Caucasians ($\beta = .068, p = .013$) but not among Asian Americans ($\beta = -.025, p = .495$).

Paternal parenting and alcohol problems by race—After controlling for age, gender, paternal education and alcohol use, we found a significant interaction effect between paternal denial of psychological autonomy and race on alcohol problems ($\beta = -.070, p = .007$). Simple slope analysis indicated paternal denial of psychological autonomy served as a risk factor for alcohol problems among Caucasians ($\beta = .122, p < .001$) but not among Asian Americans ($\beta = .008, p = .814$).

Maternal parenting and marijuana use by race—After controlling for age, gender and paternal education, we found a significant interaction effect between maternal warmth and race on marijuana use ($\beta = .107, p = .014$). Simple slope analysis indicated maternal warmth was protective against marijuana use among Caucasians ($\beta = -.138, p = .003$) but not among Asian Americans ($\beta = .041, p = .500$).

Paternal parenting and marijuana use by race—None of the main or interaction effects was significant.

Discussion

Our study adds to the existing literature by disaggregating parenting dimensions and examining their associations with alcohol problems and marijuana use across Caucasians and Asian Americans. Prior research suggested mean differences in parenting dimensions between Caucasians and Asian Americans with lower levels of parental warmth and parental encouragement of behavioral freedom, but higher levels of parental denial of psychological autonomy (lack of autonomy granting) among Asian Americans compared to Caucasians (Chao, 2001; Chao & Aque, 2009; Chao & Tseng, 2002). We replicated and extended these findings by showing how the warmth and denial of psychological autonomy parenting dimensions were consistently associated with substance use outcomes. First, maternal warmth was inversely associated with both alcohol problems and marijuana use among Caucasians but not Asian Americans. Second, high levels of paternal and maternal denial of psychological autonomy were both associated with increased alcohol problems among Caucasians but not Asian Americans. These findings suggest that cross-cultural moderation of the association between parenting and substance use appears to be specific to certain parenting dimensions.

Research conducted among Caucasians suggested parental warmth as a protective factor against alcohol problems across development (Backer-Fulghum, Patock-Peckham, King, Roufa, & Hagen, 2012; Barnow et al., 2002; Patock-Peckham & Morgan-Lopez, 2007). We replicated this finding for maternal parenting and observed that the protective effects of parenting can neither be generalized to paternal parenting among both racial groups nor maternal parenting among Asian Americans. Prior studies suggested that perhaps paternal parenting influences such as by paternal rejection (measured with PBI warmth items that were not reversed coded) may be indirect and through the mediating mechanisms of depression (Patock-Peckham & Morgan-Lopez, 2007) and stress (Backer-Fulghum et al., 2012) which were not examined here. Thus, our findings are inconsistent with those of Varvil-Weld, Mallett, Turrissi, and Abar (2012) who found that college students reporting

negative relationships with their fathers were more likely to experience alcohol related consequences among Caucasians.

The absence of protective effects of parental warmth on substance use among Asian Americans is consistent with prior research indicating a weaker beneficial effect of authoritative parenting style among Asian Americans (Chao, 2001; Kim & Rohner, 2002). Asian Americans may find the lack of maternal warmth as more normative among their peers with similar cultural identification and did not perceive it as negative as Caucasians may. Alternatively, parental care and love may be expressed differently in Asian American families through indirect ways such as providing tangible needs and parental sacrifice (Chao & Kaeochinda, 2010). As such, Asian Americans may attribute the lack of direct expression of parental warmth to cultural differences rather than interpreting it as a lack of parental care and love (Chao, 2001; Julian et al., 1994; Wu & Chao, 2005). These reasons may explain why maternal warmth was not associated with substance use among Asian American college students.

Parental denial of psychological autonomy is positively associated with alcohol problems among Caucasians (Foxcroft & Lowe, 1995). We extended this research by showing similar effects for both paternal and maternal parenting. We also found that these associations did not generalize to Asian Americans. This finding can be understood within the larger cultural context, in which Caucasians generally tend to value individuality and self-reliance more so than Asian Americans (Greenfield, 1994; Markus & Kitayama, 1991). Specifically, Caucasians with parents who denied their psychological autonomy might feel that their individuality was violated. Consequently, once they gain greater independence, Caucasians may engage in greater experimentation with alcohol and experience more related problems. In contrast, Asian Americans might be less affected by violations of their individuality because of the collectivistic cultural norms (Markus & Kitayama, 1991). Specifically, they may be more ready to accept parental control relative to Caucasians (Chao, 1994; Chao & Aque, 2009) because such parenting behaviors are more normative in Asian American families (Chao & Tseng, 2002). Parental denial of psychological autonomy may therefore have no detrimental effect on alcohol problems among Asian Americans.

We did not find cross-cultural moderation of the association between parental encouragement of behavioral freedom and substance use outcomes. This is inconsistent with Barber, Olsen, and Shagle's (1994) suggestion that parental psychological control is positively linked to internalizing problems, whereas parental behavioral control is more associated with externalizing problems. This could be due to differences between parental behavioral control and parental encouragement of behavioral freedom constructs, with the prior focusing more on parental limit setting and monitoring and the latter focusing more on letting children make their own choices.

This study has several limitations. First, we relied on retrospective self-report to measure parenting which may introduce report biases. Future research could obtain parenting measures from multi-informants across development. Second, we collected data from a cross-sectional sample of college students which limits generalizability of findings. Future research could recruit a longitudinal sample of adolescents from the community. Third,

information on family structure was not collected as part of this study, which could be an important covariate as it might shape how emerging adults recall or perceive their past experiences with parents. Finally, we did not collect data on ethnic subgroup, generational status, and other cultural factors, which could potentially be important moderators of the parenting-substance use associations. For example, the associations between parenting and substance use among second-generation Asian Americans might mimic patterns among Caucasians more so than those observed among first-generation Asian Americans. Future research could extend the current findings by testing parenting by cultural variable interactions on substance use behaviors among Asian Americans.

These limitations are offset by this study's unique strengths. First, we disaggregated the global parenting construct into three parenting dimensions and showed differential associations with substance use outcomes. Second, consistent with the recommendations of other researchers (Chassin & Handley, 2006; Luk, Farhat, Iannotti, & Simons-Morton, 2010; Patock-Peckham & Morgan-Lopez, 2006), our findings highlighted the importance of differentiating between maternal versus paternal parenting. Third, research among Asian Americans has primarily focused on the etiology of problematic alcohol use, and seldom tested whether correlates of problematic alcohol use can be generalized to the prediction of marijuana use (Hendershot et al., 2009; Montgomery, Fisk, & Craig, 2008). Our findings demonstrated that the generalizability may be specific to certain parenting dimensions and substance use outcomes. Finally, in contrast to prior studies testing the joint effects of cultural factors and parenting among Asian American youth (Hahm et al., 2003; Park et al., 2010; Wang et al., 2012), this study included a Caucasian comparison group to allow tests of moderation in the same sample and was the first to demonstrate significant cross-cultural moderation effects.

While we did not find any significant association between parenting and substance use among Asian Americans in the current study, it is premature to conclude that family-based substance use interventions are necessarily ineffective for Asian American youth. First, the parenting constructs included in this study are not exhaustive, and it is plausible that other parenting constructs such as parental sacrifice (Chao & Kaeochinda, 2010) or helicopter parenting (i.e. reflecting a hovering parent overly involved in his/her child's life; Padilla-Walker & Nelson, 2012) are more relevant in the collectivistic Asian cultural context. Second, while the direct links between parenting and substance use were not significant for Asian Americans, parenting could be associated with important mediators such as impulse control (Patock-Peckham & Morgan-Lopez, 2006), depressive symptoms (Luk, Wang, & Simons-Morton, 2010; Patock-Peckham & Morgan-Lopez, 2007), or negative peer influence (Wang, Simons-Morton, Farhart, & Luk, 2009), which might indirectly confer substance use risks for Asian Americans. Future studies should examine a wider range of parenting variables and also test potential indirect links between parenting and substance use behaviors among Asian Americans.

This study provides a solid foundation to further investigations that examine whether culturally-adapted parenting interventions are necessary for Asian American families. Given the collectivistic nature of Asian cultures, it is reasonable to assume family factors are critical points of intervention. This study, however, showed that what is commonly thought

of as optimal parenting characteristics may not be correlated with substance use outcomes among Asian Americans. Future research should examine whether these and other parenting dimensions may interact with cultural factors to predict substance use outcomes (Luk, Emery, Karyadi, Patock-Peckham, & King, 2013). Longitudinal research is also needed to test the etiology of substance use among Asian American across development.

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Figure 1.

The associations between (a) maternal warmth and alcohol problems, and (b) maternal warmth and marijuana use differed across Caucasians and Asian Americans.

Figure 2.

The associations between (a) maternal denial of psychological autonomy and alcohol problems, and (b) paternal denial of psychological autonomy and alcohol problems differed among Caucasians and Asian Americans.

Table 1

Means and Standard Deviations of Study Variables for the Entire Sample and by Race

Study Variables	Overall (<i>n</i> = 839)		Caucasian (<i>n</i> = 550)		Asian American (<i>n</i> = 289)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Age	18.88	1.11	18.89	1.13	18.87	1.08	0.26	0.80
Gender (Female) ^a	448	(53.40%)	300	(54.55%)	148	(51.21)	0.85	0.36
Paternal Education	7.03	2.90	7.49	2.56	6.15	3.28	6.53	<.001
Maternal Warmth	2.47	0.53	2.56	0.51	2.29	0.52	7.18	<.001
Maternal Encouragement of Behavioral Freedom	2.03	0.65	2.06	0.65	1.96	0.65	2.12	.035
Maternal Denial of Psychological Autonomy	1.16	0.66	1.07	0.67	1.33	0.63	-5.51	<.001
Paternal Warmth	2.16	0.66	2.24	0.64	2.01	0.67	4.86	<.001
Paternal Encouragement of Behavioral Freedom	1.99	0.64	2.03	0.61	1.92	0.67	2.36	.018
Paternal Denial of Psychological Autonomy	0.81	0.57	0.72	0.54	0.99	0.59	-6.43	<.001
Alcohol Use	21.77	21.23	26.09	22.01	13.36	16.71	8.52	<.001
Alcohol Problems ^b	0.46	0.59	0.57	0.64	0.25	0.40	7.81	<.001
Marijuana Use	1.15	1.64	1.40	1.74	0.67	1.30	6.24	<.001

^aFor gender, we present frequency and percentage of female participants as well as the chi-square statistic instead of mean, standard deviation and the t-test statistic.^bThe potential range of alcohol problems was from 0 to 8. The actual range of alcohol problems was from 0 to 3.69 for the overall sample, 0 to 3.69 for Caucasians, and 0 to 2.05 for Asian Americans.

Table 2

Bivariate Correlations between Parenting and Substance Use Variables by Race

Study Variables	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Maternal Warmth	1.00	.402 ^{**}	-.315 ^{**}	.283 ^{**}	.121 ^{**}	-.158 ^{**}	.003 ^{**}	-.095 [*]	-.111 ^{**}
2. Maternal Encouragement of Behavioral Freedom	.423 ^{**}	1.00	-.504 ^{**}	.169 ^{**}	.550 ^{**}	-.310 ^{**}	.012 ^{**}	-.029 [*]	-.032 ^{**}
3. Maternal Denial of Psychological Autonomy	-.178 ^{**}	-.337 ^{**}	1.00	-.204 ^{**}	.228 ^{**}	.424 ^{**}	.034 ^{**}	.101 [*]	.078 ^{**}
4. Paternal Warmth	.416 ^{**}	.162 ^{**}	-.214 ^{**}	1.00	-.367 ^{**}	-.248 ^{**}	.041 ^{**}	.005 ^{**}	.007 ^{**}
5. Paternal Encouragement of Behavioral Freedom	-.241 ^{**}	.558 ^{**}	.134 [*]	-.404 ^{**}	1.00	.581 ^{**}	-.022 ^{**}	.014 ^{**}	-.063 ^{**}
6. Paternal Denial of Psychological Autonomy	-.090 [*]	-.153 [*]	.358 ^{**}	-.160 ^{**}	.372 ^{**}	1.00	-.038 ^{**}	.061 ^{**}	-.056 ^{**}
7. Alcohol Use	.042 [*]	-.030 [*]	.046 [*]	.095 [*]	-.029 [*]	-.035 [*]	1.00	.814 ^{**}	.561 ^{**}
8. Alcohol Problems	.068 [*]	.047 [*]	-.014 [*]	.062 [*]	-.070 [*]	-.036 [*]	.805 ^{**}	1.00	.565 ^{**}
9. Marijuana Use	.069 [*]	.118 [*]	-.050 [*]	.026 [*]	-.059 [*]	-.111 [*]	.491 ^{**}	.578 ^{**}	1.00

Note. Means, standard deviations and bivariate correlations for Caucasians are presented in **bold** above the diagonal. Means, standard deviations and bivariate correlations for Asian Americans are presented in *italics* below the diagonal.

* $p < .05$

** $p < .01$.

Table 3
Multivariate Regression Model Results: Associations between Parenting Dimensions and Substance Use

Predicting Alcohol Problems								
Model 1: Maternal Parenting					Model 2: Paternal Parenting			
Predictors	<i>b</i>	<i>SE</i>	β	<i>p</i>	<i>b</i>	<i>SE</i>	β	<i>p</i>
Intercept	.432	.058	--	.000	.470	.060		.000
Age	−.003	.011	−.006	.746	−.006	.011	−.010	.604
Gender	.031	.024	.026	.198	.006	.025	.005	.803
Paternal Education	.002	.004	.010	.635	.002	.004	.010	.621
Race (Caucasian vs. Asian American)	−.031	.027	−.024	.265	−.040	.028	−.032	.143
Alcohol Use	.023	.001	.823	.000	.023	.001	.820	.000
Parental Warmth	−.118	.031	−.105	.000	−.022	.020	−.024	.287
Parental Encouragement of Behavioral Freedom	.031	.022	.034	.148	.039	.023	.041	.093
Parental Denial of Psychological Autonomy	.061	.024	.068	.013	.127	.031	.122	.000
Parental Warmth × Race	.113	.049	.059	.022	--	--	--	--
Parental Encouragement of Behavioral Freedom × Race	--	--	--	--	--	--	--	--
Parental Denial of Psychological Autonomy × Race	−.084	.040	−.052	.036	−.119	.044	−.070	.007

Predicting Marijuana Use								
Model 3: Maternal Parenting					Model 4: Paternal Parenting			
Predictors	<i>b</i>	<i>SE</i>	β	<i>p</i>	<i>b</i>	<i>SE</i>	β	<i>p</i>
Intercept	2.172	.277	--	.000	2.202	.283	--	.000
Age	−.074	.050	−.050	.141	−.069	.051	−.047	.172
Gender	−.493	.112	−.149	.000	−.494	.116	−.149	.000
Paternal Education	.021	.020	.038	.283	.011	.020	.019	.584
Race (Caucasian vs. Asian American)	−.752	.125	−.217	.000	−.704	.125	−.202	.000
Parental Warmth	−.427	.144	−.138	.003	−.023	.095	−.009	.811
Parental Encouragement of Behavioral Freedom	.107	.103	.042	.297	.094	.109	.036	.388
Parental Denial of Psychological Autonomy	.063	.096	.026	.511	−.054	.119	−.019	.648
Parental Warmth × Race	.554	.225	.107	.014	--	--	--	--

Predicting Marijuana Use					
Model 3: Maternal Parenting			Model 4: Paternal Parenting		
Predictors	<i>b</i>	<i>SE</i>	β	<i>p</i>	
Parental Encouragement of Behavioral Freedom $\times$ Race	---	---	---	---	---
Parental Denial of Psychological Autonomy $\times$ Race	---	---	---	---	---

Note. We conducted four multivariate regression models to examine the effects of maternal and paternal parenting on alcohol problems and marijuana use. We trimmed the models by excluding non-significant interaction terms in the final models.