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## A Confirmatory Model for Substance Use Among Japanese American and Part-Japanese American Adolescents

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### Abstract

Few studies have examined the effect of ethnicity and cultural identity on substance use among Asian and Pacific Islander adolescents. A cross-sequential study conducted in Hawai'i with 144 Japanese American and part-Japanese American adolescents assessed a model integrating Japanese ethnicity, cultural identity, substance use, major life events, and social support. Japanese American adolescents scored higher on the Japanese Culture Scale and on the Peers' Social Support than the part-Japanese American adolescents. Significant associations for substance use and impairment included culturally intensified events and Japanese cultural identity- behavior subset. Models had good overall fits and suggested that conflict surrounding cultural identity may contribute to substance use.

### Keywords

Substance Use; Japanese American adolescents; Japanese Culture Scale; mixed ethnicity

### Introduction

In the United States, substance use among adolescents aged 12 to 17 continues to be a significant health problem (Johnston, O'Malley, Bachman, & Schulenberg, 2004; Substance Abuse and Mental Health Services Administration [SAMHSA], 2003; 2008; 2011).

Although current illicit drug use rates among this population have declined between 2002 and 2008 from 11.6% to 9.3%, recent trends showed a resurgence in 2010 to 10.1% (SAMHSA, 2011). Specifically, marijuana, which had decreased between 2002 (8.2%) and 2008 (6.7%), has increased in 2010 (7.4%). Similarly, ecstasy, which had declined from

0.5% in 2002 to 0.3% in 2004, has increased to its former rate of 0.5% in 2009 and 2010. Initiation of substance use does not appear to be occurring at a younger age, despite previous trends for earlier use (DeWit, Adlaf, Offord, & Ogborne, 2000; Gruber, DiClemente, Anderson, & Lodico, 1996; Hingson, Heeren, & Winter, 2006; SAMHSA, 2011). However, there was an increase of illicit drug use with age, from 4.0% at ages 12 or 13 to 9.3% at ages 14 or 15 to 16.6% at ages 16 or 17. The highest rate (23.1%) of current illicit drug use was among 18 to 20 year olds (23.1%) (SAMHSA, 2011). This pattern suggests that adolescent drug use may continue or possibly worsen in young adulthood.

Substance use for a significant number of teens continues through adulthood, where it becomes problematic and includes health issues such as accidental injuries, drug-related complications affecting multiple organ systems and neurocognitive impairments, and other acute and chronic health-related problems (Ammerman et al., 1999; Brown et al., 2008; Goodwin & Gabrielli, 1997; Thoma et al, 2011). Comorbid mental health disorders such as depression, suicide, and conduct disorders are also significant (Fergusson & Harwood, 1997; Hawkins, Catalano, Morrison, O'Donnell, Abbot, & Day, 1992; Robins & McEvoy, 1990; Shaffer et al., 1996; Waldrop, Hanson, Resnick, Kilpatrick, Naugle, & Saunders, 2007). Although substance use among adolescents may begin as exploratory, it is nonetheless associated with and predictive of future use of increasingly harmful substances such as heroin and cocaine (Chen, Storr, & Anthony, 2009; Fergusson, Boden, & Horwood, 2006; Lynskey et al., 2003; Yamaguchi & Kandel, 1984). Identifying and understanding factors that contribute to substance use and dependence, lending to high rates of morbidity and mortality among adolescents, is greatly needed.

Because there are numerous factors that contribute to an increased risk of substance abuse among adolescents (Johnston et al., 2007), understanding the socio-cultural context of the individual is important. Cultural factors, which are often neglected, contribute to substance abuse due to their influence on beliefs, values, behavior, and self-identity. Diverse populations and regional differences may also influence which and how drugs are used and the effects experienced by their use (Ellickson & Morton, 1999; Heath, 1999). Consequently, culture is an important factor to consider especially when providing treatment and conducting research for substance use in areas of great diversity, such as in Hawai'i.

Substance use and abuse among Asian and Pacific Islanders is a rarely examined but important health concern. Few studies have examined ethnic subcategories within Asian and Pacific Islander populations. The lack of examining ethnic identification and the use of aggregate data may inadvertently conceal the varying rates of drug use among diverse groups and those most at risk for drug related health issues (Otsuka, 2003). The limited research that has been conducted suggests that Asian American groups in the continental United States use less alcohol and have lower rates of alcohol-related problems than Whites, Blacks, and Hispanics (Chi, Lubben, & Kitano, 1989; Harachi, Catalano, Kim, & Choi, 2001; Kitano, Chi, Rhee, & Law, 1992; SAMHSA, 2011). Despite these findings, alcohol-related problems are increasing (Grant et al., 2004) and substantial variations in drinking behaviors exist among different Asian subgroups. For example, one study reported more drinkers than abstainers among Japanese and Chinese Americans and more abstainers than drinkers among Filipino and Korean Americans (Chi et al., 1989). Rates of heavy drinking

also differed among Asian subgroups, with the highest proportions of heavy drinkers being Japanese Americans, followed by Filipino, Korean, and Chinese Americans. Other studies also reported Japanese Americans as having the highest level of drinking as compared to other Asian American ethnic groups (Iwamoto, Takamatsu & Castellanos, 2012; Price, Risk, Wong & Klingle, 2002; Wong, Klingle, & Price, 2004). In an assessment of alcohol and other drug service needs among Asian Americans in California, those of Vietnamese and Chinese-Vietnamese origin had higher alcohol consumption levels than those of Japanese, Chinese, Korean, and Filipino origin (Sasao, 1991). In addition, subgroup specific rate differences have been found among Asian American youth participating in studies in California and Hawaii and in several national studies (Goebert, Nishimura, Onoye, Boyd, Rehuher, & Christensen, 2009; Otsuki, 2003; Price, Risk, Wong & Klingle, 2002). Although a few of these studies have focused on conducting research with Japanese Americans (Chi et al., 1989; Otsuki, 2003; Wong, Klingle, & Price, 2004), research that examines substance abuse among individuals of two or more ethnicities (i.e., part-Japanese) is lacking (Price, Risk, Wong & Klingle, 2002).

In Hawai'i, Asian and Pacific Islanders are the majority population, providing a unique location where 57.4% of the state self-identified as Asian "alone or in combination with one or more other races" and where Japanese Americans comprise a significant portion of the population, accounting for almost 13.6% (United States Census, 2010). For Hawai'i youth, substance use continues to be a significant problem (Goebert, Nishimura, Onoye, Boyd, Rehuher, Christensen, 2009; Klingle, 2001; Pearson, 2003). Gateway drugs, including cigarettes, alcohol, and marijuana, had the highest rates of use (Goebert et al., 2009). Alcohol, which was the most commonly used, had a lifetime substance use rate of 15.6% for 6th graders, 36.2% for 8th graders, 56.5% for 10th graders, and 72.4% for 12th graders. Similarly, cigarettes, marijuana, prescription drugs, and illicit drugs all showed increasing use with lifetime prevalence rates for 12<sup>th</sup> graders being the highest. In addition, 1.6% of 6th graders, 4.8% of 8th graders, 10.5% of 10th graders, and 17.8% of 12th graders met criteria for substance abuse or dependence. Students of different ethnicities had varying rates and patterns of alcohol and drug use, with Native Hawaiian and White students having the highest rates of substance use. Students with 2 or more ethnicities also reported high rates. Substance use research must therefore address how ethnic populations are grouped and studied as needs may differ.

The importance of culture as it relates to substance use is an area of increasing study. Primary socialization theory incorporates culture and examines the complex relationships between ethnicity and cultural identification on substance use (Oetting, Donnermeyer, Trimble, & Beauvais, 1998). Accordingly, adolescent drug use is a learned behavior, socially reinforced and not necessarily motivated by emotional distress. Healthy bonding with the three primary socialization sources including family, school, and peer clusters is important. If problems exist with bonding, an adolescent is at increased risk for engaging in drug use. Thus, ethnicity, cultural identification (which is the strength of one's affiliation with a group), and cultural norms (including those for substance use), must be examined when studying substance use among diverse populations.

Substance use has been found to be significantly correlated with mood and anxiety disorders and alcohol abuse and dependence among Japanese nationals (Tominaga et al., 2009). Unfortunately, similar studies are lacking among Japanese and part-Japanese American adolescents. Building on our previous work with conceptual models of cultural predictors of anxiety (Williams et al., 2002) and depression among Japanese American and part-Japanese American adolescents (Williams et al., 2005), in addition to the literature on cultural identity, we formulated a conceptual model integrating Japanese ethnicity, cultural identity, and substance use. Previous findings suggest that cultural identity formation contributes to anxiety and depression experienced by adolescents of mixed heritage. Furthermore, two subscales for Major Life Events, which is a scale that assesses for stressful life events, were identified—*culturally intensified events* and *other negative life events* (Williams et al., 2002, 2005). Culturally intensified events were traditional Japanese characteristics and events, such as avoiding family discord, whereas other negative life events were items that were not specific to being Japanese.

The proposed model builds upon previous findings that conflicts between culturally intensified events and mainstream values and behaviors affect psychological well-being (Williams et al., 2002, 2005). It is expected that psychological well-being, specifically using substances, will be influenced by other negative life events, which are not specific to Japanese culture and may be due to cultural change or cultural mixing. In addition, socioeconomic status, such as parent's education, family income, and the adolescent's gender may contribute to substance use through the need to maintain or improve social status and financial stability. The previously developed conceptual models of cultural predictors of anxiety and depression (Williams et al., 2002, 2005) were used to formulate, test, and confirm a model for substance use.

As seen in the model in Figure 1, this study proposes that Japanese ethnicity influences Japanese cultural identity. However, cultural identity formation is a multifaceted, dynamic process involving relationships with family, peers, and community distress. As a result, tension may be created through conflicts between beliefs, value, self-identity and behavior (i.e., participation in culture-specific activities) and may affect psychological well-being, specifically the use of alcohol and drugs. This study is among the first to examine the effects of these variables on substance use and to assess a hypothesized model comparing substance use between Japanese and part-Japanese American high school seniors in Hawai'i.

## Methods

### Design

The National Center on Indigenous Hawaiian Behavioral Health (NCIHBH), in collaboration with the National Center for American Indian and Alaska Native Mental Health Research Program (Ackerson, Wiegman-Dick, Manson, & Baron, 1990), conducted a cross-sequential study of adolescents in Hawai'i from 1992–1996, when the Japanese Culture Scale was used (Williams et al., 2002, 2005). Herein, we focus only on those adolescents who identified their parents as being Japanese or part-Japanese American.

## Participants

The 1996 survey consisted of 515 seniors (12th graders) from two demographically similar high schools on one of the Hawaiian Islands. The 1996 survey focused on high school seniors because it was hypothesized that their sense of self would be better developed at this age than at a younger age. The sample reported herein included 51 (33 men, 18 women) Japanese American students and 93 (46 men, 47 women) part-Japanese American students. Students were defined as part-Japanese American if they identified at least one of their biological parents as being Japanese. The mean number of different ethnicities among the part-Japanese American students was 3.48 ( $SD = 1.40$ ) per adolescent, and the proportional distributions of the accompanying ethnicities were 47 (50.5%) European American, 46 (49.5%) Hawaiian, 32 (34.4%) Portuguese, 31 (33.3%) Chinese, 29 (31.2%) Filipino, 15 (16.1%) Hispanic, 10 (10.8%) Native American/Alaska Native, 9 (9.7%) Puerto Rican, 7 (7.5%) Korean, 1 (1.1%) African American, and 4 (4.3%) identified as other. Among the total sample of the Japanese and part-Japanese American students, 79.7% reported having lived their entire life in Hawai'i. Sixty percent of students were surveyed from the school enrollment, with reasons for nonparticipation including refusal of parental permission, students declining to participate, or absenteeism.

## Procedure

Trained high school teachers distributed the Hawaiian High Schools Health Survey. Parents provided passive consent, whereas students provided their assent. The survey took approximately 45 minutes to complete. All procedures were approved by the Institutional Review Board of the University of Hawai'i.

## Measures

The Hawaiian High Schools Health Survey is a 22-page, self-report questionnaire. It includes select items from the Substance Abuse Subtle Screening Inventory-Adolescent (SASSI-A) version, the Major Life Events Scale, the Japanese Culture Scale, the Perceived Social Support from Family Scale (PSS-Fa) and the Perceived Social Support of Peers Scale (PSS-Pe).

**Demographics**—Demographic measures included ethnicity, gender, main wage earners' education and main wage earners' employment. Main wage earners' education was based on the highest level attained in school, with the educational levels being categorized into three groups—high school or less; some college; and completion of college. Main wage earners' employment status was divided into three categories—unemployed/welfare/disability, part-time employment/retired, and full-time employment/self-employment. This variable served as a proxy for income.

**Substance Abuse Subtle Screening Inventory-Adolescent (SASSI-A)**—To assess substance use, six items were chosen from the SASSI-A (Miller, 1985). The six items were found to be a good screening instrument among Native Hawaiian and non-Hawaiian adolescents in predicting substance abuse and dependency rates as determined through the Diagnostic Interview Schedule for Children version 2.3 (Nishimura et al., 2001). The “True/False” questions included: (1) “I have sometimes drunk too much beer or other alcoholic

drink”; (2) “I have used alcohol or ‘pot’ too much or too often”; (3) “I smoke cigarettes regularly”; (4) “I have neglected school work because of drinking or using drugs”; (5) “I have taken a drink in the morning to steady my nerves or to get rid of a hangover”; and (6) “Sometimes I feel that my drug use or drinking is keeping me from getting what I want out of life.” True or mostly true responses were coded 1, and false or mostly false responses were coded 0, with the total score ranging from 0 to 6. Higher scores reflect greater substance use. Two factors were derived from a previous study (Nishimura et al., 2001): (1) Factor 1, substance use, Items 1-3 (standardized factor loadings of 1.03, 0.69, and 0.60, respectively for non-Hawaiian adolescents); and (2) Factor 2, impairment, Items 4-6 (standardized factor loadings of 0.95, 0.83, and 0.82, respectively, for non-Hawaiian adolescents). For the present sample ( $N = 144$ ), Cronbach  $\alpha$  was .64 for Factor 1, .44 for Factor 2, and .64 for all six items.

**Major Life Events Scale**—Major stressful life events (13 items for self and 14 items for family members), including culturally intensified events and other negative life events, were measured with the Major Life Events Scale (Andrews, Lewinsohn, Hops, & Roberts, 1993; Williams et al., 2002). The Major Life Events Scale has been previously studied and has been found to be both reliable and valid for this Asian and Pacific Islander sample (Miyamoto et al., 2001; Williams et al., 2002, 2005). Students were asked to identify whether an event occurred to a family member or to themselves within the previous six months. Stressful life events included being arrested, financial problems, relationship discord, new relationship, pregnancy, arguing, problems with drugs or alcohol, leaving home, and attempted suicide. These items were classified as *culturally intensified events*. Also included were items about death, illness, being a victim of violence, having an important possession stolen, and getting into a car or bike accident and these were classified as *other negative life events*.

**Japanese Culture Scale**—Japanese cultural identity was measured with the Japanese Culture Scale (Izutsu, Yanagida, Matsukawa, & Takeshita, 1999; Matsu, Takeshita, Izutsu, & Hishinuma, 2011; Williams et al., 2002, 2005). The scale examined self-identification, values, beliefs and behavior. Detailed scale description can be found in Williams et al. (2002, 2005). The self-identification subset was composed of one question that asked about how the student sees himself or herself. The value subscale included a question on how much the adolescent valued Japanese beliefs, customs, and attitudes. The belief subscale included 22 questions that assessed duty, obligation, and responsibility. Behavior was a composite of subscales based on the mean of the customs, lifestyle, and activities subsets. For the entire Japanese sample prior to deleting participants with missing data, the Cronbach  $\alpha$  coefficient for each of the Japanese Culture Scale subscales was .91 for customs, .70 for lifestyle, .85 for activities, .77 for beliefs, and .83 overall. Z-scores were used given the different response scales. The overall Japanese Culture Scale score was based on the mean of the self-identification, values, beliefs, and behavior composites.

**Perceived Social Support from Family (PSS-Fa) and of Peers (PSS-Pe) Scales**—The PSS-Fa and PSS-Pe are both six-item subscales of the Perceived Social Support Inventory (Licitra-Kleckler & Wass, 1993; Procidano & Heller, 1983). Six questions on

each scale were rated on a 5-point Likert scale, with 1 = “always false”; 2 = “often false”; 3 = “neither true nor false”; 4 = “often true”; and 5 = “always true.” The statements describe feelings and experiences related to emotional support and reliance on either family or friends' relationships during the past six months. Item six was reverse scored given the wording. Higher scores indicated higher levels of family or friend support.

### Data Analyses

Descriptive statistics, analyses of variance (ANOVAs), and univariate logistic regressions were conducted for comparisons between Japanese and part-Japanese American adolescents, and to compare boys versus girls. These included analyses of the demographics, the SASSI-A, culturally intensified events, other negative life events, the Japanese Culture Scale, and the PSS-Fa and PSS-Pe. Structural equation modeling (SEM) was conducted to assess the fit of the conceptual model for substance use and used demographic variables including ethnicity, cultural identity, culturally intensified events, and other negative life events, as well as an interaction of self-identity by behavior. The sample analyzed included only those participants with complete data on all variables ( $N=144$ ).

### Results

Demographically, the Japanese and part-Japanese American groups did not differ significantly based on gender ( $\chi^2[1, N = 144] = 3.09, p = .0787$ ), main wage earners' education ( $\chi^2[2, N = 144] = 4.98, p = .0830$ ), and main wage earners' employment status ( $\chi^2[2, N = 144] = 4.63, p = .0988$ ). For the Japanese Americans, there were 33 (64.7%) male and 18 (35.3%) female adolescents; for the part-Japanese Americans, there were 46 (49.5%) male and 47 (50.5%) female adolescents. For the main wage earners' education level of high school or less, some college or community college, and college graduate, 5 (9.8%), 12 (23.5%), and 34 (66.7%), respectively, were Japanese Americans and 15 (16.1%), 34 (36.6%), and 44 (47.3%), respectively, were part-Japanese Americans. For the main wage earners' employment status of unemployed, welfare, or disability, employed part-time or retired, and employed full-time or self-employed, 0 (0.0%), 2 (3.9%), and 49 (96.1%), respectively, were Japanese Americans and 5 (5.4%), 9 (9.7%), and 79 (84.9%), respectively, were part-Japanese Americans.

As cultural difference may be associated with generational status, generational differences were assessed. Although no significant difference was found between Japanese American and part-Japanese American students with alpha set at .05 ( $\chi^2[5, N = 129] = 10.7, p = .0576$ ), the resulting  $p$  value was similar when the outcome was anxiety (.044; Williams et al., 2002) and depressive symptoms (.0435; Williams et al., 2005). When examining substance use as an outcome, there was no significant interaction effect between Japanese or part-Japanese Americans and generation ( $F[1, 125] = 0.2; R^2 = .000; p = .9584$ ).

Differences between the Japanese American and the part-Japanese American adolescents on the Japanese Culture Scale, culturally intensified events, other negative life events, family support, friend support, and substance use are depicted in Table 1. Significant differences were indicated for all measures of the Japanese Culture Scale with the Japanese Americans reporting higher mean scores than the part-Japanese Americans. There was also a significant

difference with Japanese American adolescents having a higher mean score on friend support than part-Japanese American adolescents. There were no significant differences between the groups on the two Major Life Events subscales, the family support, or on the SASSI-A factors or items.

When gender differences were examined for Japanese cultural identity and its components, there were significant differences (Table 2). Female Japanese American adolescents had significantly greater mean scores on behavior overall and on lifestyle and activities, but lower mean scores on belief systems than Japanese American male adolescents. Female part-Japanese American adolescents had significantly lower mean scores on belief systems than male part-Japanese American adolescents. When gender differences were examined for social support, female part-Japanese American adolescents had significantly greater mean scores on friend support than male part-Japanese American adolescents. However, among both Japanese and part-Japanese American adolescents, there were no gender differences for the Major Life Events subscales, family support, and substance use SASSI-A factors and items.

Table 3 presents the structural equation model coefficients and goodness-of-fit statistics for the model with the SASSI-A items and factors each treated separately as an outcome. In general, the goodness-of-fit of the models was adequate when using the traditional cut-off point of 0.90 (Hooper, Coughlan, & Mullen, 2008) and even with the root mean square error of approximation, which favors parsimony, the models still had a mediocre fit (Hooper, Coughlan, & Mullen, 2008; MacCallum, Browne, & Sugawara, 1996). A slightly different pattern of statistically significant coefficients emerged across the SASSI-A items and the two factors. The variable of culturally intensified events was statistically significant in solely predicting excessive alcohol use, overall substance use, and Factor 1 (Use of Substances). Lower main wage earners' education was solely predictive of regular cigarette smoking. Gender (female) and a lack of friend support were predictive of drinking in the morning. Gender (male), lower main wage earners' education, low level of belief system, and culturally intensified events were significantly associated with substance use interfering with life's goals. Behavior overall was negatively associated, whereas culturally intensified events were positively associated with both neglecting schoolwork and Factor 2 (Impairment).

When the Japanese and part-Japanese Americans in the full sample ( $n = 196$ ) were collapsed together and mean comparisons were conducted with the non-Japanese American adolescents ( $n = 284$ ), the Japanese and part-Japanese American sample had significantly lower scores for "sometimes drank beer or alcohol" (0.38 versus 0.48,  $p = .0312$ ), "too much alcohol or 'pot'" (0.12 versus 0.20,  $p = .0273$ ) and "drinking in the morning" (0.01 versus 0.04,  $p = .0399$ ). No significant differences were found for smoking cigarettes regularly, neglecting schoolwork, or drinking/drugs holding me back.

## Discussion

This study proposed that Japanese ethnicity influences Japanese cultural identity, which may affect psychological well-being, specifically the use of alcohol and drugs. This study is among the first of its kind to examine the effects of these variables on substance use among



Japanese and part-Japanese American adolescents. As previously reported using the same data (Williams et al., 2002, 2005), we found that Japanese American adolescents reported significantly stronger Japanese cultural identity overall, as well as stronger affiliations with Japanese values, self identity, belief systems and behaviors including customs, lifestyle, and activities, compared with part-Japanese American adolescents. Previous studies suggest that these events are linked to the psychological well-being for both Japanese American and part-Japanese American youth, but to varying degrees (Williams et al., 2002, 2005). Components of ethnic identity, including affirmation and belonging (sense of group membership and attitudes toward the individual's group), ethnic identity achievement (the extent to which a person has achieved a secure and confident sense of their ethnicity), and ethnic behavior (activities associated with group membership), and their relationship to psychological well-being have also been previously studied (Otsuki, 2003; Roberts, Phinney, Masse, Chen, Roberts, & Romero, 1999). This current study attempts to explore whether substance use, similar to depression and anxiety, is related to ethnic and cultural identity.

In general, when Japanese American and part-Japanese American adolescents were compared in regards to substance use by factors and individual drug items, no significant difference existed. Perhaps affiliation with Japanese culture is a protective variable against substance use and that for both the Japanese American and the part-Japanese American adolescents, their affiliation was adequately protective. To further support this idea, the Japanese American and part-Japanese American adolescents were collapsed together and mean comparisons were conducted with the non-Japanese American adolescents from the overall cross-sequential study of adolescents in Hawai'i from 1992-1996. There were significant differences on three of the six items with the non-Japanese American adolescents having higher mean scores. This suggests that there is a need to understand the degree to which one is affiliated with the Japanese culture, because it may be important in determining the role it plays in being a protective variable for substance use.

### **Substance Use and Social Support**

The Japanese American adolescents reported significantly higher mean friend support than the part-Japanese American adolescents. Social support associated with increased ethnic identity has been clearly linked to improved psychological well-being and may have similar associations with substance use (Roberts et al., 1999; Williams et al., 2002, 2005). Although limited research exists on the influence of social support on substance use, especially among Japanese and part-Japanese American adolescents, some studies emphasize the importance of peer norms (Ando, Asakura, Ando, & Simons-Morton, 2007; Brendgen, Vitaro, & Bukowski, 2000; Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001). Although the literature on Japanese American adolescents is limited, the data among Japanese nationals indicate that peer norms of alcohol use acceptance are correlated with increased alcohol consumption (Ando et al., 2007; Higuchi, Matsushita, Maesato, & Osaki, 2007; Kono, Saito, Shimada, & Nakagawa, 1977; Parrish, Higuchi, Stinson, Towle, Dufour, & Harford, 1992; Suzuki, Minowa, & Osaki, 2000). Thus, it is possible that ethnic identity, peer norms, gender and environmental influences affect whether substance use is reinforced and accepted.

### Substance Use and Gender

As previously reported using the same data (Williams et al., 2002, 2005), female Japanese American adolescents reported higher mean scores on behavior, lifestyle, and activities and lower mean scores on belief systems than male Japanese American adolescents. Regarding gender differences and substance use, there were no significant gender differences between male and female Japanese or part-Japanese Americans. However, when structural equation modeling was conducted to assess the conceptual model for substance use, gender (woman) and lack of friend support were predictive of drinking in the morning, whereas gender (man), lower main wage earners' education, low level of belief system, and culturally intensified events were significantly associated with substance use interfering with life's goals. This suggests that gender is a complicated construct that needs to be explored within a global framework rather than as a single predictive variable for substance use and similar to other studies, that interventions may need to be gender based (Cheng, Lee, & Iwamoto, 2012).

Although research specifically with Japanese and part-Japanese American adolescents is lacking, cross-cultural and gender differences regarding alcohol use has been conducted among Japanese nationals and Japanese Americans in Hawai'i and in California (Parrish et al., 1992). An increase in drinking levels was associated with more tolerant drinking attitudes in all of these groups. Previously, Japanese national women were more likely to abstain from alcohol than the women in the two other groups of Japanese Americans (Clark & Hesselbrook, 1988; Kitano, Chi, Law, Lubben, & Rhee, 1988; Tsunoda et al., 1992). However, rates of Japanese national women who drink are increasing (Higuchi et al., 2007). In addition, alcohol use has been identified as an important aspect of socialization, with gender differences among Japanese national and Japanese American adults (Parrish et al., 1992). This supports the idea that substance use may be a complex construct influenced by several variables, including environmental/regional and situational differences.

### Substance Use, Social Support and Gender

In previous studies, young women have been found to have greater attachment to family and friends and to use these relationships to define themselves (Gilligan, 1982; Gilligan, Lyons, & Hammer, 1990). Nahulu et al. (1996) found that among Native Hawaiians, "connectedness" was a gender-related variable. Consistent with our findings, connectedness through friend support may be a protective variable against substance use. The female Japanese American adolescents who lacked well-established social groups were more likely to drink in the morning. Among Japanese national adolescents, many junior high school students reported drinking with their families but in small amounts, whereas high school students were more likely to drink more often and larger amounts (Suzuki et al., 2000). Examining how differences in gender roles and socialization for Japanese American and part-Japanese American adolescents is necessary in order to understand its influence on substance use.

### Substance Use and Japanese Affiliation

In our conceptual model for substance use, the variable of culturally intensified events was statistically significant in solely predicting excessive alcohol use, overall substance use and

Factor 1 (Use of Substances). It also contributed to predicting for substance use interfering with life's goals, neglecting schoolwork and Factor 2 (Impairment). As an independent variable, culturally intensified events is a significant predictor in three of the six individual items and for overall substance use and both factors. Clearly, it is an important variable to consider when attempting to identify predictors of substance use, because it solely or partially predicted for six of nine substance use variables.

Previous studies support that alcohol-related social problems have been associated with culture bound factors (Izuno et al., 1992; Partanen, 2006). Among Japanese nationals and Japanese American men, alcohol-related social problems varied, possibly due to differing societal and cultural norms. In Japanese nationals, drinking plays an important role in business and in socializing with friends and colleagues and can be framed within a historical context (Parrish et al., 1992; Partanen, 2006). For Japanese and part-Japanese American adolescents, it is possible that this socialized use of alcohol is mimicked and thus, explains why behavior and culturally intensified events are predictive of Factor 2 (Impairment). There has also been evidence that lower incomes, possibly lower socioeconomic status in general, is significantly associated with substance use (i.e., marijuana and cocaine use) (McLaughlin, Raymond, Murakami, & Goebert, 1987). For Japanese and part-Japanese American adolescents, main wage earners' education level was predictive for smoking cigarettes and substances interfering with goals. Our study suggests that demographic variables, cultural issues and ethnic identity may influence substance use.

Social and cultural environments are related to adolescent substance involvement (Herman-Stahl, Spencer, & Duncan, 2003; United States Department of Health & Human Services [USDHHS], 2001; Yu, Stiffman, & Freedenthal, 2005). Several studies have suggested that culture is an important factor in adolescents' substance use among Asian minorities (Chen, Unger, Cruz, & Johnson, 1999; Hahm, Lahiff, & Guterman, 2003; Phinney, 1990; Unger et al., 2000). The process of individuation which begins in adolescence (Noack & Puschner, 1999) may result in significant changes in the adolescent-parent relationship. According to Ying, Lee, and Tsai (2001), switching perspectives from a collective-oriented culture to an individualistic culture presents considerable challenges for individuals. For instance, Hahm, Lahiff, & Guterman (2003) found that the most acculturated group of Asian American adolescents (English speaking at home, U.S. born) had the highest risk of using alcohol and cigarettes. Johnson (2007) found individualism-collectivism to be independently associated with substance use and abuse, with higher rates in individualistically oriented nations. Le, Goebert, and Wallen (2010) demonstrated differences in the degree to which individualism-collectivism mediated substance use for various Asian ethnicities. Thus, cultural identity may affect adolescents' choices of health behavior such as engaging in substance use.

Differing rates of substance use may be more related to communities and how communities are defined from a cultural, ethnic and regional perspective. Previous studies focusing on drug use among Asian Americans have been limited with the existing literature lacking detailed epidemiological analyses (McLaughlin et al., 1987). While there is evidence that differences among Asian Americans exist (McLaughlin et al., 1987), research must examine each group, being sensitive to these cultural, ethnic and regional differences. In addition, there must be an understanding that constructs, such as gender differences, require

examination within the larger framework of the individual and their community. Examining individual variables may only partially describe the sample, whereas exploring conceptual models that attempt to identify predictive variables within a socio-cultural context may be more informative.

## Limitations

The study had several limitations. First, the data were collected approximately 20 years ago. However, because substance use continues to be a health challenge and the influence of ethnicity and cultural identity on physical and mental health continues to be understudied for Asian and Pacific Islanders in general (but specifically for Japanese and part-Japanese American adolescents), we believe the findings are still relevant to the current socio-cultural context of today's adolescents. Second, we focused specifically on seniors in high school and thus, findings are not generalizable to the broader adolescent demographic. Finally, despite the overall Cronbach  $\alpha$  for the SASSI items being appropriate, the Cronbach  $\alpha$  for SASSI Factor 2 was only .44.

## Conclusions

A confirmatory model linking Japanese cultural identity and substance use among Japanese and part-Japanese American adolescents in Hawai'i was tested. Notwithstanding the limitations, the model found that culturally intensified events were significantly associated with alcohol use, neglecting school, drugs/drinking holding me back, overall substance use and both substance use factors. For the Japanese and the part-Japanese American adolescents, culturally intensified events may play a critical role regarding alcohol and drug use from a community perspective, acknowledging that community incorporates cultural, ethnic and regional factors. Further research needs to be conducted, especially on the continental United States where the Asian and Pacific Islander population is increasing at a proportionally high rate (U.S. Census, 1990; U.S. Census, 2010). Geographic location, whether Hawai'i, the continental United States, or Japan, is a significant factor affecting the psychological functioning of individuals, especially ethnically diverse people. Understanding the role that alcohol and substance use plays among adolescents, including those of mixed ethnicities, may help in the prevention, diagnosis, and treatment of substance use. Adolescence is a difficult and dynamic stage of development and clinicians need to be aware that alcohol and substance use and the health consequences due to such use, may manifest during this period. Culturally appropriate care for Japanese American and part-Japanese American adolescents can only occur if there is a better understanding of the influences and effects that culture, ethnicity and regional locale has on alcohol and substance use among adolescents.

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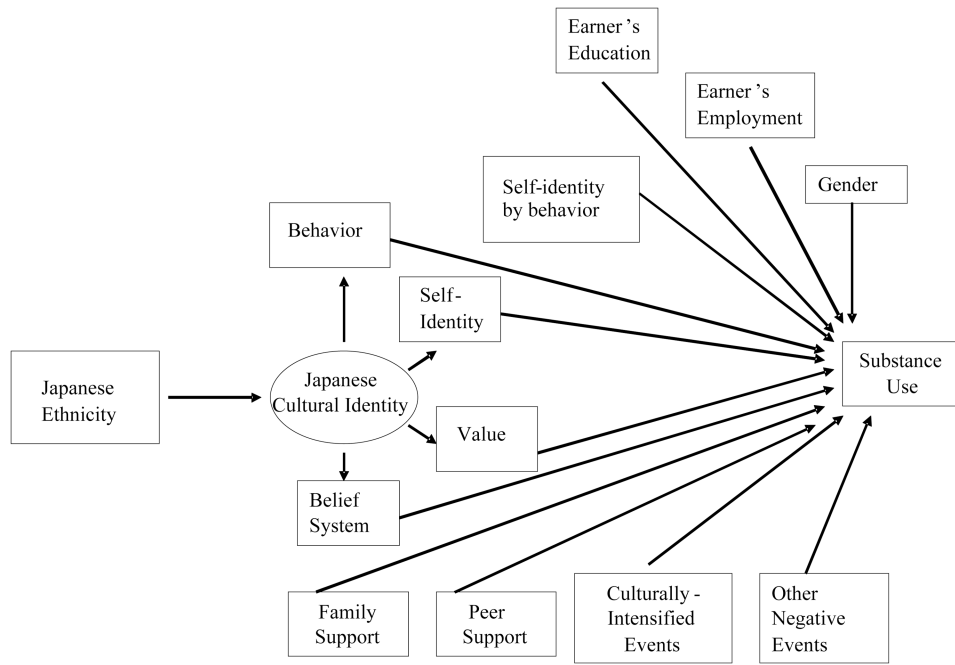


Figure 1. Confirmatory Model for Japanese Ethnicity and Cultural Predictors of Substance Use

**Table 1**  
**Mean Comparisons between Japanese American and Part-Japanese American Adolescents**

Variable	Part-Japanese (N = 93)		Japanese (N = 51)		F (df = 1, 142)	Significance Test	
	M	(SD)	M	(SD)		R <sup>2</sup>	p
Japanese Cultural Identity							
Value	-0.27	(1.01)	0.62	(0.69)	31.3	0.180	<.0001
Behavior	-0.23	(0.81)	0.60	(0.54)	43.8	0.236	<.0001
Custom	-0.32	(0.98)	0.79	(0.48)	57.8	0.290	<.0001
Lifestyle	-0.16	(1.00)	0.52	(0.61)	19.8	0.122	<.0001
Activities	-0.22	(0.93)	0.50	(0.85)	21.1	0.129	<.0001
Self Identity	-0.30	(0.91)	0.46	(1.02)	21.0	0.130	<.0001
Belief system	-0.07	(0.79)	0.22	(0.87)	4.0	0.028	0.0472
Major Life Events							
Culturally Intensified Events	1.40	(1.62)	1.14	(1.56)	0.9	0.006	0.3507
Other Negative Events	0.88	(1.03)	1.00	(0.83)	0.5	0.004	0.4820
Support							
Family Support	3.72	(0.91)	3.58	(0.86)	0.8	0.006	0.3596
Friend Support	4.00	(0.72)	4.23	(0.49)	4.3	0.030	0.0390
Substance Use	0.13	(0.19)	0.11	(0.17)	0.4	0.003	0.5348
Factor 1 - Use	0.23	(0.31)	0.22	(0.31)	0.1	0.001	0.7498
Factor 2 - Impairment	0.03	(0.12)	0.01	(0.05)	1.7	0.012	0.1973
Wald $\chi^2$ (df = 1)							
Question							
1 Sometimes drank beer or alcohol	0.38	(0.49)	0.37	(0.49)	0.0	0.000	0.9641
2 Too much alcohol or "pot"	0.12	(0.33)	0.08	(0.27)	0.6	0.008	0.4571
3 Smoke cigarettes regularly	0.20	(0.41)	0.20	(0.40)	0.0	0.000	0.9063
4 Neglected school because of drinking or drugs	0.03	(0.18)	0.00	(0.00)	0.0	0.100	0.9617
5 Drinking in the morning	0.01	(0.10)	0.00	(0.00)	0.0	0.077	0.9503

Variable	Part-Japanese (N = 93)		Japanese (N = 51)		Significance Test	
	M	(SD)	M	(SD)	F	p
6 Drugs/drinking holding me back	0.04	(0.20)	0.02	(0.14)	0.5	0.4744

Note: F tests involved analysis of variance (ANOVA). Waldy<sup>2</sup> involved univariate logistic regressions; R<sup>2</sup> based on maximum value.

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**Table 2**  
**Mean Comparisons between Japanese American and Part-Japanese American Adolescents by Gender**

Variable	Part-Japanese (N = 93)				Japanese (N = 51)				Significance Test					
	Males (n=46)		Females (n=47)		Males (n=33)		Females (n=18)		F	R <sup>2</sup>	p			
	M	(SD)	M	(SD)	M	(SD)	M	(SD)	(df=1, 49)					
<b>Japanese Cultural Identity</b>														
Value	-0.23	(0.99)	-0.30	(1.05)	0.1	0.001	0.7388	0.55	(0.70)	0.76	(0.66)	1.1	0.023	0.2910
Behavior	-0.32	(0.86)	-0.15	(0.76)	1.1	0.012	0.2984	0.44	(0.58)	0.90	(0.30)	9.8	0.167	0.0029
Custom	-0.38	(1.03)	-0.26	(0.93)	0.4	0.004	0.5563	0.70	(0.52)	0.96	(0.33)	3.6	0.069	0.0634
Lifestyle	-0.37	(1.03)	0.04	(0.94)	3.9	0.041	0.0506	0.37	(0.67)	0.80	(0.34)	6.5	0.117	0.0140
Activities	-0.22	(0.98)	-0.22	(0.88)	0.0	0.000	0.9882	0.26	(0.90)	0.94	(0.55)	8.6	0.149	0.0052
Self Identity	-0.38	(0.94)	-0.21	(0.88)	0.8	0.009	0.3762	0.31	(0.94)	0.74	(1.13)	2.1	0.040	0.1587
Belief system	0.15	(0.80)	-0.28	(0.73)	7.3	0.074	0.0082	0.49	(0.90)	-0.28	(0.57)	10.6	0.178	0.0020
<b>Major Life Events</b>														
Culturally Intensified Events	1.24	(1.75)	1.55	(1.47)	0.9	0.010	0.3516	0.97	(1.42)	1.44	(1.79)	1.1	0.022	0.3044
Other Negative Events	0.80	(1.05)	0.96	(1.02)	0.5	0.006	0.4768	1.03	(0.77)	0.94	(0.94)	0.1	0.003	0.7262
<b>Support</b>														
Family Support	3.84	(0.82)	3.61	(0.98)	1.5	0.017	0.2190	3.60	(0.88)	3.55	(0.86)	0.0	0.001	0.8466
Friend Support	3.80	(0.81)	4.19	(0.57)	7.1	0.073	0.0090	4.18	(0.40)	4.32	(0.62)	1.0	0.020	0.3245
Substance Use	0.13	(0.21)	0.13	(0.17)	0.0	0.000	0.8721	0.11	(0.16)	0.12	(0.18)	0.1	0.002	0.7713
Factor 1 - Use	0.23	(0.32)	0.24	(0.30)	0.1	0.001	0.7991	0.20	(0.29)	0.24	(0.36)	0.2	0.004	0.6757
Factor 2 - Impairment	0.04	(0.13)	0.01	(0.10)	1.5	0.016	0.2289	0.01	(0.06)	0.00	(0.00)	0.5	0.011	0.4658
<b>Question</b>														
1 Sometimes drank beer or alcohol	0.39	(0.49)	0.36	(0.49)	0.1	0.001	0.7683	0.36	(0.49)	0.39	(0.50)	0.0	0.001	0.8585
2 Too much alcohol or 'pot'	0.13	(0.34)	0.11	(0.31)	0.1	0.003	0.7199	0.06	(0.24)	0.11	(0.32)	0.4	0.018	0.5273
3 Smoke cigarettes regularly	0.15	(0.36)	0.26	(0.44)	1.5	0.026	0.2216	0.18	(0.39)	0.22	(0.43)	0.1	0.004	0.7287
4 Neglected school because of drinking or drugs	0.04	(0.21)	0.02	(0.15)	0.4	0.016	0.5528	0.00	(0.00)	0.00	(0.00)	n/a	n/a	n/a

Variable	Part-Japanese (N = 93)				Japanese (N = 51)				Significance Test						
	Males (n=46)		Females (n=47)		Males (n=33)		Females (n=18)		F	R <sup>2</sup>					
	M	(SD)	M	(SD)	M	(SD)	M	(SD)	(df=1, 91)	(df=1, 49)					
5 Drinking in the morning	0.00	(0.00)	0.02	(0.15)	0.00	(0.00)	0.00	(0.00)	0.0	0.131	0.9596	0.00	(0.00)	n/a	n/a
6 Drugs/drinking holding me back	0.09	(0.29)	0.00	(0.00)	0.03	(0.17)	0.00	(0.00)	0.0	0.203	0.9459	0.00	(0.00)	0.0	0.098

Note: F tests involved analysis of variance (ANOVA). Wald  $\chi^2$  involved univariate logistic regressions; R<sup>2</sup> based on maximum value.

**Table 3**  
**Substance Use Items and Factors with Structural Equation Model Variables**

Variable	Substance Use						Overall	Factor 1	Factor 2
	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6			
Gender	-0.08	0.02	0.03	0.01	0.20 *	-0.27 *	-0.05	-0.02	-0.11
Earners' Employment	0.03	-0.02	0.00	0.09	0.07	0.12	0.04	0.01	0.14
Earners' Education	0.00	0.00	-0.24 *	0.07	0.02	-0.16 *	-0.11	-0.11	-0.06
Behavior by Self Identity	0.05	0.00	-0.11	0.09	-0.08	0.00	-0.01	-0.02	0.02
Behavior	0.15	-0.03	-0.07	-0.24 *	-0.13	-0.14	-0.03	0.04	-0.25 *
Self Identity	-0.13	-0.10	0.01	-0.03	0.07	0.04	-0.08	-0.10	0.03
Value	-0.14	-0.13	-0.01	0.11	0.12	0.01	-0.08	-0.12	0.10
Belief System	-0.01	0.05	0.00	0.03	0.14	-0.18 *	-0.01	0.01	-0.06
Culturally Intensified Events	0.39 *	0.15	0.16	0.23 *	0.11	0.27 *	0.36 *	0.32 *	0.31 *
Other Negative Events	-0.11	-0.02	0.07	-0.12	-0.04	0.05	-0.04	-0.03	-0.04
Family support	-0.09	-0.01	-0.10	0.06	0.03	0.12	-0.04	-0.09	0.12
Friend support	-0.00	-0.04	0.16	-0.08	-0.27 *	0.08	0.03	0.06	-0.07

\*  $t > 1.96$

Item 1:  $N = 144$ ,  $R^2 = 9.05\%$ ,  $\chi^2 = 99.92$ ,  $df = 37$ ,  $RMSEA = .1090$ ,  $RMR = .0477$ ,  $GFI = .9144$ ,  $p < .0001$   
 Item 2:  $N = 144$ ,  $R^2 = 4.01\%$ ,  $\chi^2 = 100.37$ ,  $df = 37$ ,  $RMSEA = .1094$ ,  $RMR = .0476$ ,  $GFI = .9140$ ,  $p < .0001$   
 Item 3:  $N = 144$ ,  $R^2 = 7.79\%$ ,  $\chi^2 = 100.10$ ,  $df = 37$ ,  $RMSEA = .1092$ ,  $RMR = .0476$ ,  $GFI = .9142$ ,  $p < .0001$   
 Item 4:  $N = 144$ ,  $R^2 = 5.33\%$ ,  $\chi^2 = 99.58$ ,  $df = 37$ ,  $RMSEA = .1088$ ,  $RMR = .0476$ ,  $GFI = .9147$ ,  $p < .0001$   
 Item 5:  $N = 144$ ,  $R^2 = 7.25\%$ ,  $\chi^2 = 99.55$ ,  $df = 37$ ,  $RMSEA = .1087$ ,  $RMR = .0476$ ,  $GFI = .9147$ ,  $p < .0001$   
 Item 6:  $N = 144$ ,  $R^2 = 12.89\%$ ,  $\chi^2 = 99.47$ ,  $df = 37$ ,  $RMSEA = .1087$ ,  $RMR = .0476$ ,  $GFI = .9148$ ,  $p < .0001$   
 Overall:  $N = 144$ ,  $R^2 = 9.17\%$ ,  $\chi^2 = 100.15$ ,  $df = 37$ ,  $RMSEA = .1092$ ,  $RMR = .0476$ ,  $GFI = .9142$ ,  $p < .0001$   
 Factor 1:  $N = 144$ ,  $R^2 = 8.40\%$ ,  $\chi^2 = 100.52$ ,  $df = 37$ ,  $RMSEA = .1096$ ,  $RMR = .0476$ ,  $GFI = .9139$ ,  $p < .0001$   
 Factor 2:  $N = 144$ ,  $R^2 = 8.96\%$ ,  $\chi^2 = 99.52$ ,  $df = 37$ ,  $RMSEA = .1087$ ,  $RMR = .0476$ ,  $GFI = .9147$ ,  $p < .0001$

Note: RMSEA = root mean square error of approximation; RMR = root mean-square residual; GFI = Goodness-of-Fit Index