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I, Jerren C Weekes-Kanu , hereby submit this original work as part of the requirements for the degree of Doctor of Philosophy in Psychology.

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General and Acculturative Stress as Predictors of Substance Use Among Black Caribbean Americans

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General and Acculturative Stress as predictors of Substance Use among Black Caribbean Americans

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ABSTRACT

This study examined acculturative stress and general stress variables as predictors of drug, alcohol, and marijuana use, separately, among Black Caribbean Americans. Additionally, mastery was examined as a moderator of the stress-substance use relationships. It was hypothesized that the acculturative stress (i.e., separation from family and perceived discrimination) and general stress (i.e., financial problems, family problems, and neighborhood risk) variables would significantly predict the substance use outcomes. It was also hypothesized that mastery would moderate the relationship between stress predictors and substance use, such that the relationship between stress and substance use would be weaker for those with greater perceived control (i.e., high mastery). This study was a secondary analysis of data from both foreign and U.S. born Caribbean Americans (N = 1438) who participated in the National Survey of American Life (NSAL), a national household survey of the physical and mental health of Black Americans. Significant predictors of substance use were examined via ordinal and multinomial logistic regression analyses. Results indicated partial support for the first hypothesis. Several stress variables (i.e., neighborhood risk, discrimination, family and financial problems) predicted increased drug and alcohol use, but did not predict marijuana use. The second hypothesis was not supported; Mastery did not moderate the relationship between stress and substance use in this study. However, other moderation effects were found. The implications of this work and directions for future research were discussed.

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Introduction

Despite the cultural diversity that exists in the United States (U.S.), immigrants face the daunting task of overcoming cultural barriers, navigating discrimination, and changing their cultural framework to accommodate Euro-American norms. Cultural modification, or acculturation, often results in increased mental distress among immigrants who integrate American norms into their lifestyle (Takeuchi, Algeria, Jackson, Williams, 2007; Williams & Berry, 1991). In fact, the prevalence of psychiatric disorders, such as depression, anxiety, and substance use disorders (SUDs), increases among immigrants as they acculturate (Ortega, Rosenheck, Alegria, & Desai, 2000). Substance use among immigrants is particularly problematic and is often associated with troublesome legal, social, and health ramifications (Rebhun, 1998).

Numerous studies on acculturative stress and substance use among immigrants exist, but with a predominant focus on Hispanic immigrants (Kim, Kalman, Gonzalez, & Ziedonis, 2010; Ornelas, Eng, & Perreira, 2011; Ortega, Rosenheck, Alegria, & Desai, 2000). Literature on substance use and its relationship to stress amongst Black Caribbean immigrants and their descendants (i.e., Black Americans of Caribbean descent) is scarce and these "invisible" immigrants (i.e., immigrants that are under-represented in research literature; Guy, 2003) often fail to receive critical mental health services (Jackson et al., 2007). The current study will elucidate the stress-substance use relationship among Black Caribbean immigrants and their descendants, by examining (1) whether general and acculturative stress predict substance use and (2) whether adaptive coping moderates the stress-substance use relationship in this group. This research is an initial step towards facilitating awareness of predictive factors of substance use

and informing the development of prevention and early intervention programs that reduce negative health outcomes in this population.

Black Caribbean immigrants (also known as Afro-Caribbean or West Indian immigrants) are the largest Black immigrant group in this country, followed by African immigrants (Capps, McCabe, & Fix, 2011). Within the U.S., Black Caribbean immigrants and Blacks of Caribbean descent (hereafter collectively referred to as Black Caribbean Americans) account for over 8% of the Black population overall. Black Caribbean Americans account for over 25% of the Black population in major metropolitan areas like New York City (Kent, 2007). Literature on the mental health of Black Caribbean Americans is scarce, primarily due to (1) difficulty recruiting such individuals for research, and (2) conflation of Black Caribbean Americans with African Americans in research due to their English speaking abilities, phenotypic similarities, and lack of visible ethnic distinctiveness such as style of dress or attire (Govia 2009; Guy, 2003). Conflation with African Americans can mask subtle, yet important, differences in mental health needs between the groups.

In 2004, the National Survey of American Life (NSAL; Jackson et al., 2004) was conducted to assess mental health needs and the prevalence of psychiatric disorders among people of African descent in the U.S., which included African Americans and Black Caribbean Americans. This national study provided insight into the prevalence of mental disorders, relevant stressors, and drug use among Black Caribbean Americans. Key findings related to mental health and substance use among Black Caribbean Americans are summarized below.

Mental Health and Substance Use among Black Caribbean Americans

Mental health. Literature suggests that the "immigrant paradox," which posits foreign birth as a protective factor against mental illness for immigrants in the U.S. (Alegría et al., 2008),

holds true for Black Caribbean Americans as well. Studies document that foreign-born Black Caribbean Americans have a decreased risk for mood, anxiety, and substance disorders, and lower lifetime prevalence rate of any psychiatric disorder, when compared to those who are born in the U.S. (Broman, Neighbors, Delva, Torres, & Jackson, 2008; Williams et al., 2007a ; Williams et al., 2007b). However, those who immigrate during early childhood have higher rates of psychiatric disorder compared to those who immigrate during early adulthood (i.e., 18 - 34 years-old). Generational status also influences the prevalence of lifetime psychiatric disorder among Black Caribbean Americans, such that those with third generation status have significantly higher rates of mental illness (54%) than those with second (35%) and first generation (19%) status (Williams et al., 2007b). Regarding gender differences, males have a higher lifetime prevalence rate of psychiatric disorder (including substance abuse) than females (31% vs. 24%; Williams et al., 2007b) in this population.

The lifetime prevalence of Major Depressive Disorder for Black Caribbean Americans is 12.9%, and men and women have comparable lifetime prevalence rates of depression (12.6% and 13.1% respectively; Williams et al., 2007a). These rates are similar to the prevalence rate for African Americans (10.4%), but significantly less than the 17.9% prevalence rate for Non-Hispanic Whites (Williams et al., 2007a). When assessing ethnic differences within gender, Black Caribbean American men have significantly higher odds for mood and anxiety disorders when compared to African American men. Black Caribbean American women have significantly lower odds of mood and anxiety disorders compared to African American women (Williams et al., 2007b).

Drug abuse/dependency. Few studies have documented the prevalence of substance use disorders (SUDs) and predictors of SUDs among Black Caribbean Americans. However, we

know from literature that the rates of SUDs are higher among males than females (e.g., 16.4% vs. 2.8% for substance abuse; Broman et al., 2008) in this population. Generational status, nativity, and age at immigration significantly influence the prevalence of SUDs among Black Caribbean Americans. Those with first generation status are significantly less likely to meet criteria for SUDs compared to those with second and third generation status (Broman et al., 2008). Black Caribbean Americans born in the U.S., and those who immigrated to the U.S. at a young age, generally have increased risk of SUDs (Carter, 2010) compared to their foreign-born counterparts.

When comparing rates of SUDs between Black ethnic groups, rates of SUDs are not significantly different between Black Caribbean Americans and African Americans overall (e.g., 9.6 vs. 11.5% for substance abuse [Broman et al., 2008]). However, a significant difference in prevalence of SUDs for Black Americans age 45-59 exists, with African Americans showing significantly higher rates of SUDs than Black Caribbean Americans within this age group. In addition, African American women have significantly higher rates of substance abuse (6.3% vs. 2.8%) and dependence (3% vs. 1.9%) than Black Caribbean American women. African American men have higher rates of substance abuse (18.1% vs. 16.4%) and dependence (7.3% and 6.4%) than Black Caribbean American men, but these rates are not significantly different.

General and Acculturative Stress

General stress. Literature clearly demonstrates the relationship between various indicators of life stress and substance use in American adults. However, research has not examined the relationship between general life stress (to include employment, financial, family/relational, and neighborhood stress) and substance use in Black Caribbean Americans. Among American adults, studies show that financial strain is associated with increased alcohol

use and smoking in adults (Pierce, Frone, Russell, & Cooper, 1994; Shaw, Agahi, & Krause, 2011). Among African Americans adults living in urban areas, neighborhood disadvantage and social stress related to increased alcohol and drug use (Boardman, Finch, Ellison, Williams, & Jackson, 2001). Marital dissatisfaction and family problems also relate to alcohol use among American adults, with dissatisfied partners being 3.7 times more likely to meet criteria for a current alcohol use disorder than satisfied partners (Whisman, Uebelacker, & Bruce, 2006). These forms of life stress have not been explored in relation to substance use among Black Caribbean Americans and warrant investigation.

Acculturative stress. Acculturative stress, a concept introduced in psychological literature during the 1970s, originates from stressors specific to the ongoing acculturation process (e.g., adjusting to a new culture in behavior, language, and norms [Williams & Berry, 1991]). Social isolation and discrimination often relate to acculturative stress among immigrants (Williams & Berry, 1991). Existing literature notes a positive association between perceived discrimination and depression, anger, anxiety, and substance use for immigrants (Williams, Neighbors, & Jackson, 2003). Social isolation and lack of a close connection with family or others of the same cultural background also relate to increased stress among immigrants (Yeh & Inose, 2003).

The variables of social isolation and discrimination are important for Black Caribbean Americans overall, but are potentially more important for foreign-born Black Caribbean Americans. More frequently than not, these individuals migrate to the U.S alone to secure work and/or education and leave behind family members and social support (Wheeler & Mahoney, 2008). The loss of a social support network has great implications for the acculturative process and mental health of these immigrants.

Foreign-born Black Caribbean Americans migrate to the U.S. from countries where those of African descent are the majority and are heavily represented in most, if not all, societal positions. Thus, they may be rudely awakened to the strong historical, yet ongoing, racial disparities between White and ethnic minority Americans, more specifically Black Americans. Literature documents the significant, positive, association between discrimination and psychological distress among Black Caribbean Americans (Govia, 2009).

Coping/Mastery

Coping is defined as the use of cognitive and behavioral resources to manage internal and external demands considered challenging or stressful (Lazarus & Folkman, 1984). Literature is clear on the importance of adaptive coping (e.g., planning, positive reframing, acceptance, positive religious coping, and use of emotional support) and its ability to buffer the negative effects of acculturative stress (Berry, 2006). A study on acculturative stress among Haitian immigrants found that those with more adaptive coping resources had higher quality of life and lower acculturative stress (Belizaire & Fuertes, 2011). A study of acculturative stress in Latino adults found a strong correlation between high stress-coping and decreased acculturative stress (Miranda & Matheny, 2000). As such, adaptive coping seems highly important for the moderation of acculturative stress amongst immigrants.

Of particular interest in this investigation is the psychosocial coping resource of mastery. Mastery is defined as the extent to which a person feels in control of life event or situations (Pearlin & Schooler, 1978). Mastery is quite similar to self-efficacy, which was originally defined by Bandura (1991) as one's beliefs about his/her capability to exercise control over life events. Self-efficacy has been further defined in the literature as one's belief in his/her ability to achieve a behavioral outcome, while mastery has been further defined as one's thoughts of the

extent to which his/her behavior can influence an outcome or life event (e.g., Manstead & van Eeckelen, 2006). Given these definitions, there are subtle difference between mastery and self-efficacy.

Nonetheless, mastery is an interesting concept in relation to substance use/abuse, given the belief that substance abuse is an avenue towards enhanced control and regulation over one's internal environment, to include emotional experiences (Wurmser, 1974). Although the utility of general mastery (i.e., mastery not specific to a particular behavior such as drug use or abstinence) as a coping asset among drug abusers has been questioned in the literature (Majer, Jason, Ferrari, Olson, & North, 2003; Majer, Jason, & Olsen, 2004), mastery has been noted as a useful coping resource that helps to regulate emotional distress, thereby indirectly supporting abstinence efforts among drug abusers (Majer, Jason, & Olsen, 2004). Previous literature noted the association between higher levels of mastery and fewer depressive symptoms (Franks & Faux, 1990; Kuo & Tsai, 1986) and greater life satisfaction (Neto, 2001). Taken together, these findings suggest that mastery may serve as a buffer between life stressors and substance use among Black Caribbean Americans. As such, mastery will be used as the coping variable of interest in this study.

Coping also plays a critical role in the Social Stress Model of Substance Abuse (SSMSA), which identifies substance use as a maladaptive reaction to social stress (including stress from family, work, the community, and peers [Rhodes & Jason, 1990]). According to this model, if a person utilizes adaptive coping methods, such as participation in positive community networks, he/she will be more resilient and less likely to use substances (Rhodes & Jason, 1990). The SSMSA was originally developed to model protective and risk factors for adolescent substance users, but has been used with adult populations (e.g., Lindenberg, Reiskin, & Gendrop, 1994). In this study, the SSMSA was adapted to include an acculturative stress factor thereby

making it a more relevant framework for research on stress, coping, and substance use among immigrant populations such as Black Caribbean Americans.

Gaps in the Literature

Several gaps in the literature must be addressed to better understand substance use/abuse, develop culturally sensitive treatments, and address the larger issue of treatment utilization among Black Caribbean Americans. First, while demographic predictors of SUDs have been explored (i.e., age, gender, nativity), research has not examined the relationship between non-demographic predictors, such as general and acculturative stress, and substance use among Black Caribbean Americans. Assessing stress predictors of substance use can help broaden our understanding of factors relevant to substance use in this group and inform prevention and early intervention programs. Second, literature supports the utility of mastery as a psychological coping resource and moderator between stress and psychological distress. This relationship has not been investigated in a Black Caribbean American sample to date. Determining if mastery functions as a buffer between stress and substance use in this population will provide insight into the potential benefit of targeting this coping ability during intervention efforts. The current study is the first to attend to these gaps in the literature and broaden the knowledge base on substance use amongst Black Caribbean Americans. Further, this study is the first to apply a modified SSMSA framework and determine if coping (i.e., mastery) moderates the relationship between both general and acculturative stress types and substance use among Black Caribbean Americans.

Current Study

The current study had two aims. First, this study investigated whether general stress (i.e., financial problems, neighborhood risk, and family problems) and acculturative stress (i.e.,

separation from family and perceived discrimination) variables predicted substance use among Black Caribbean Americans. It was hypothesized that the general and acculturative stress variables would significantly predict substance use. Second, this study evaluated mastery as a moderator of the relationship between the stress variables and substance use. Based on theory from the SSMSA, it was hypothesized that mastery would function as a moderator, such that the relationship between stress and substance use would be weaker for those with greater perceived control (i.e., higher mastery scores).

Method

Participants

This study was a secondary analysis of data from the National Survey of American Life (NSAL), a national household survey of the physical and mental health of Black Americans (Jackson et al., 2004). Participants in the NSAL included 3,570 African Americans, 1,438 Black Caribbean Americans [i.e., immigrant and U.S. born Blacks of Caribbean descent who reside in the U.S.], 891 non-Hispanic Whites, and 183 participants who identified as "other" Hispanic. Participants had to be 18 years of age or older, speak English, and self identify as Black (requirement for African Americans and Caribbean Americans only) in order to meet the eligibility criteria for the NSAL. Given the nature of the current study, only data from the Black Caribbean Americans were used to test the current study hypotheses. Thirty-five Black Caribbean American participants were removed from the dataset, given incomplete data collection, which left a remaining sample size of 1,403.

Procedure

One participant per household was chosen to participate in the NSAL by a four-stage random selection procedure developed by the Survey Research Center (SRC) of the Institute for

Social Research at the University of Michigan (Jackson et al., 2004). The stages of the random selection procedure were as follows: (1) a probability sample of U.S. metropolitan statistical areas and counties was obtained, (2) specific area segments were selected, (3) housing units within the selected area segments were randomly selected, (4) one participant per household was selected from eligible housing units (for additional information see Heeringa et al., 2006). NSAL investigators targeted pre-identified metropolitan areas, where Black Caribbean Americans accounted for over 10% of the population, to ensure adequate sampling of this group (Williams et al., 2007b). Data were collected via face-to-face interviews that took place within the home of each participant. A questionnaire over 400 items in length was administered to each participant in an interview that lasted approximately two hours and forty minutes. Interviews were conducted in multiple sessions, as necessary, to reduce participant fatigue and increase the likelihood of collecting accurate and reliable data. The participants received a monetary incentive of $50.00 for their involvement in the study. These data were archived within the Inter-University Consortium for Political and Social Research (ICPSR), and were obtained, with permission, from ICPSR for the purposes of this research study. Institutional Review Board approval was obtained for the procedures of this study.

Variables and Measures

Demographics. Several items from the NSAL were used to obtain age, gender, education, income, nativity, and length of residence in the U.S. for each participant. Regarding ethnicity, individuals were classified as Black Caribbeans if they answered yes to the question, "Are you of West Indian or Caribbean descent" and denied other ethnic descent/origin (e.g., Hispanic descent).

Acculturative stress. The following variables were used as indicators of acculturative stress:

Separation from family. The following item from the NSAL was used to assess separation from family, "How often do you see, write or talk on the telephone with family or relatives who do not live with you?" The response for this item was based on a 7-point Likert scale ranging from 1- "nearly every day" to 7- "never," with higher scores indicating more separation.

Perceived discrimination. Discrimination was measured using a 10-item measure of "every day" discrimination in the NSAL that assessed daily encounters with discrimination. This measure assessed issues such as "being treated with less respect," "people acting as if they are afraid of you," and "people acting as if you are not smart." Responses to the items were based on a 6-point Likert scale, ranging from 1- "almost every day" to 6- "never." Participant responses were recorded, so that higher scores indicated more perceived discrimination, and summed to derive a total perceived discrimination score. This scale produced a Cronbach's alpha value of .89 in this sample, which indicated good internal consistency.

General stress. The following variables were used as indicators of general stress:

Neighborhood risk. The following items were used to construct a neighborhood risk scale: (1) "How often are there problems with muggings, burglaries, assaults or anything else like that in your neighborhood?" (responses ranged from 1- "very often" to 5- "never") and (2) "How much of a problem is the selling and use of drugs in your neighborhood?"(responses ranged from 1- "very serious" to 4- "not serious at all"). Participant responses were reverse coded, such that higher scores indicated greater neighborhood risk. Responses were summed

across items to derive a total neighborhood risk score. This two-item scale yielded a Cronbach's alpha of.69, which indicated acceptable internal consistency.

Family problems. Three items from the NSAL were used to assess negative interactions with family members (i.e., make too many demands on you, criticize you, and take advantage of you) and the responses are based on a 4 point Likert scale (1- "very often" to 4- "never"). These items were reverse scored (i.e., higher scores indicated more problems) and summed to create a total scale score. Cronbach's alpha for this scale was .73, which indicated acceptable internal consistency for this sample.

Financial problems. Two items from the NSAL were used to create a financial stress scale. The first item is "How difficult is it for (you/your family) to meet the monthly payments on your (family's) bills?" Responses are based on a 5-point Likert scale (1-"extremely difficult" to 5- "not difficult at all"). The second item is "How much do you worry that your total (family) income will not be enough to meet your (family's) expenses and bills?" Responses are based on a 4-point Likert scale (1- "a great deal" to 4-"not at all). Responses were reverse coded so that higher scores indicated more financial problems. Participant responses were summed across items to get a total financial problems score. A Cronbach's alpha of .77 was obtained in this sample, which indicated acceptable internal consistency.

Mastery. The Pearlin's Mastery scale (Pearlin & Schooler, 1978), a seven item self-report measure, was used to assess mastery. Participants responded to items such as, "Some of my problems I can't seem to solve at all" and "I often feel helpless dealing with the problems of life," based on a 4-point Likert scale that ranged from strongly agree (1) to strongly disagree (4). Two positively worded items were reverse coded in compliance with scoring guidelines. This scale has well-established psychometric properties (Pearlin & Schooler, 1978) and has been used

in diverse samples. This 7-item measure yielded a Cronbach's alpha of .57 in this sample, which indicated poor reliability. Internal consistency improved to .74 when the two positively worded items were removed from the scale. As such, these items were removed from the scale. The final scale consisted of the five items, with total scores ranging from 5 to 20. Higher scores indicated a higher sense of mastery.

Substance use. Alcohol use, drug use, and, separately, marijuana use were the substance use variables of interest. Alcohol use was assessed with the following item, "In the past 12 months, how often did you usually have at least one drink." Responses were based on a 6-point Likert scale and ranged from "nearly every day" to "did not drink in past 12 months." Responses were recoded so that higher scores indicated more frequent use. Drug use consisted of separate items for four types of substances (i.e., marijuana, cocaine, abuse of prescription medications, and "other" [such as heroin, LSD, peyote, opium, and glue]) that assessed the frequency of use for each substance 12 months prior to assessment. Answers for each item was based on a 5-point Likert scale and ranged from "nearly every day" to "less than once a month." The four drug use items (i.e., marijuana, cocaine, prescription medications, and "other") were reverse coded and summed across items to derive a total drug use value. Marijuana use was assessed both jointly (within the drug use variable) and separately. Higher values indicated a higher frequency of use for all substance use outcomes.

Data Analysis

Alcohol use, drug use, and, separately, marijuana use were the outcomes of interest. The predictors of interest were family problems, neighborhood risk, perceived discrimination, separation from family, and financial problems. Descriptive statistics, Spearman's rho correlations, multicollinearity diagnostics, and normality diagnostics were conducted. There was

no evidence of multicollinearity between the predictor variables. Results from the Kolmogorov-Smirnov normality test revealed significant skew ($p<.01$) for each substance use variable, which could not be corrected with common transformations (e.g., log, log10, and square root). The substance use variables were re-coded from continuous to ordinal, thereby minimizing the skewness in the data and circumventing the loss of information and power that would have resulted from dichotomization. The levels of substance use are as follows: (1) no use, (2) light use (i.e., less than once per month to three days per month), (3) moderate use (i.e., one to four days per week), and (4) heavy use (i.e., nearly every day). For the drug use variable, which consisted of a sum score across four substance (i.e., marijuana, cocaine, prescription medication, other), level of use was determined based on the highest frequency of use endorsed by participants across the four substances.

Ordinal regression analyses were performed to assess significant predictors of drug use. Additionally, a separate ordinal regression analysis was used to examine predictors of marijuana use within 12 months pre-assessment among participants who endorsed lifetime marijuana use. Ordinal regression was initially used for the alcohol use outcome. However, the resulting model violated the ordinal Test of Parallel Lines assumption ($p <.05$), which is the basic assumption that the slope coefficients are the same across response categories (Chan, 2005). Multinomial logistic regression is the recommended analysis in situations where a violation of the Test of Parallel Lines occurs (Chan, 2005) and was used to assess predictors of alcohol use in this study.

The regression models controlled for age and gender. Predictor variables with significant bivariate correlations with the dependent variables at the $p \leq .25$ level were included in the regression models as predictors. Mastery and relevant interaction terms (i.e., mastery by significant predictor variables) were subsequently entered into the regression models to test

moderation hypotheses. All continuous variables were centered prior to moderation analyses. Missing data were confirmed to be missing completely at random (MCAR) via the Little MCAR test (p >.05; Little 1988). As such, missing data were removed from analyses via listwise deletion, a commonly used statistical practice for handling data that are MCAR (Howell, 2012). Analyses were conducted in the Statistical Package for Social Sciences (SPSS), version 21.

Results

Sample Characteristics

This sample was predominantly female (n = 853[61%]) and the mean age was 41 (SD = 15.42; age range 18-94). Seventy-four percent of the sample was foreign-born. A large percentage of the foreign-born participants were from Jamaica (502 [36%]) and Haiti (290 [21%]); the remaining participants were from Trinidad and Tobago and "other" Caribbean countries. Of those who were foreign-born, 68% migrated to the U.S. at the age of 18 or older. The main reasons for immigration were to be with family (n = 282 [20%]), for work (n = 175 [13%]), for education (n = 95 [9%]), and for better opportunities in life (n = 89 [6%]). Eighty-one percent (n = 1,141) had 12 or more years of education, 74% (n = 1042) were employed, and 43% (n = 602) were married or cohabitating. Over 65% (n = 968) of this sample resided in the Northeast region of the U.S. and the remaining 29% resided in the South. Data on neighborhood type, such as rural versus urban neighborhood, were not available. Table 1 contains additional demographic information.

Table 2 summarizes the mean, standard deviation, and range of scores for the predictor and moderator variables. Overall, participants endorsed minimal levels of perceived discrimination and separation from family. Moderate levels of neighborhood risk (i.e., selling of

drugs or burglary), financial problems, and family problems were found. Participants had a high level of mastery overall, as indicated by a mean score of 15.33 (*SD* = 3.70) out of a possible 20.

Drug and Alcohol Use

The mean age of onset for substance use ranged from 17 to 22 (see Table 3). Alcohol use and prescription medication abuse had the earliest age of onset (*M* =17 [*SD* = 5.80-9.19]), followed by marijuana use (*M* = 18 [*SD* =5.67]), cocaine use (*M* = 21 [*SD* =4.88]), and "other" illicit substance use (*M* = 22 [*SD* = 10.39]). See Table 3 for additional drug and alcohol information, such as frequency and levels of substance use.

Results from Crosstabulation and Chi-square analyses indicated that females were less likely to be drug users than males (χ^2 = 53.86 [*df* = 3], *p*<.00). Foreign-born Black Caribbean Americans were less likely to use drugs than those born within the U.S. (χ^2 = 47.61 [*df* = 3], *p*<.00). Regarding alcohol use, males were more likely to be moderate and heavy alcohol users, while females were more likely to be non-drinkers or light drinkers (χ^2 = 71.14 [*df* = 3], *p*<.00). Of those who consumed alcohol, foreign-born participants were more likely to be light, moderate, and heavy alcohol users than those born in the U.S. (χ^2 = 30.67 [*df* = 3], *p*<.00). Of the foreign-born participants who consumed alcohol, Jamaicans and those from "other" Caribbean nations were more likely to be light, moderate, and heavy alcohol users (χ^2 = 53.84[*df* = 9], *p* <.00) than those from Haiti and Trinidad and Tobago. Employed participants were more likely to be light, moderate, and heavy drug and alcohol users (χ^2 = 40.63[*df* = 6], *p* =.00 and χ^2 = 20.11 [*df* = 6], *p* =.00, respectively) than those who were unemployed or out of the job force. There were no significant differences in level of alcohol or drug use among foreign-born participants based on their number of years in the U.S. (*p*>.05).

Predictors of Substance Use

The first aim of this study was to assess general stress (i.e., financial problems, neighborhood risk, and family problems) and acculturative stress (i.e., separation from family and perceived discrimination) variables as predictors of substance use among Black Caribbean Americans. It was hypothesized that all stress variables would significantly predict substance use. Partial support for this hypothesis was obtained, as seen in the results below.

Drug Use. Results from this ordinal regression analysis are presented in Table 5. Each of the following variables had significant bivariate correlations ($p < .25$) with drug use and were entered into the regression model: family problems, financial problems, neighborhood risk, perceived discrimination, and separation from family. The overall model was significant ($\chi^2 = 128.80$ [$df = 7$], $p < .00$; Nagelkerke Pseudo $R^2 = .17$) and fit the data well. Controlling for gender and age, neighborhood risk (odds ratio [OR] = 1.21, 95% confidence interval [95%CI] = 1.09 - 1.35; $p = .00$) and perceived discrimination (OR = 1.02, 95%CI = 1.00 – 1.05; $p = .04$) associated with increased odds of being in a higher level of drug use, holding all other variables in the model constant (see Table 5). Regarding the demographic predictors, older participants had decreased odds of being in a high level of drug use (OR = .95, 95%CI = .94 - .97; $p = .00$), while male participants had increased odds (OR = 3.51, 95%CI = 2.32 - 5.33; $p = .00$).

Alcohol Use. Results for the multinomial logistic regression analysis are presented in Table 6. Each of the following variables had significant bivariate correlations ($p < .25$) with alcohol use and were entered into the regression model: family problems, financial problems, perceived discrimination, and separation from family. The overall model was significant ($\chi^2 = 122.02$ [$df = 18$], $p < .00$; Nagelkerke Pseudo $R^2 = .13$) and fit the data well. Specific individual factors differentiated non-alcohol user from users in the light, moderate, and heavy categories.

Compared to those with no use, light alcohol users were less likely to be older (relative risk ratio [RRR] = .98, 95%CI = .97 - .99; p <.00) and endorse financial problems (RRR =.92, 95%CI = .86 - .99; p = .03). However, they were more likely to report perceived discrimination (RRR = 1.03, 95%CI = 1.01 – 1.05; p = .03), compared to non-users. Those with moderate use were more likely to be male (RRR = 3.33, 95%CI = 2.24 – 4.95; p = .00) and report more perceived discrimination (RRR = 1.02, 95%CI = 1.00 – 1.05; p = .00), but were less likely to be older in age (RRR = .98, 95%CI = .97 - .99; p = .00), compared to non-users. Lastly, those with heavy alcohol use were more likely to be male (RRR = 7.12, 95%CI = 3.23 – 15.69; p = .00) and report more family problems (RRR = 1.26, 95%CI = 1.09 – 1.45; p = .00) than non-users.

Marijuana Use. The following variables had significant bivariate correlations (p <.25) with marijuana use and were entered into the ordinal regression model along with gender and age: family problems, financial problems, neighborhood risk, and perceived discrimination. Although the overall model was significant (χ^2= 65.58 [df = 6], p <.00; Nagelkerke Pesudo R^2 = .18), the stress variables did not significantly predictor marijuana use (see Table 7). Of note, neighborhood risk was marginally significant (p = .07). As expected, older age related to decreased odds of being in a higher level of marijuana use (OR = .94, 95%CI = .92 - .96; p = .00), while male gender associated with increased odds of being in a higher level of marijuana use (OR = 2.60, 95%CI = 1.59 - 4.27; p = .00), holding all other variables constant.

Moderation Results

The second aim of this study was to evaluate mastery as a moderator of the relationship between the stress variables and substance use. It was hypothesized that mastery would function as a moderator, such that the relationship between stress and substance use would be weaker for those with greater perceived control (i.e., higher mastery scores). This hypothesis was not

supported. Mastery did not significantly moderate the relationship between stress predictors and substance use outcomes. However, mastery significantly moderated the relationship between age and marijuana use (p = .01; see Table 8). Participants in the high mastery group had a greater reduction in marijuana use as aged increased, compared to participants in the low mastery group. Additionally, high mastery associated with greater, rather than lower, marijuana use among young participants (i.e., 18 to 35 years old). Finally, participants older than 60 did not endorse marijuana use, regardless of their level of mastery (see Figure 1).

Subsequent, exploratory, moderation analyses included gender and nativity as moderators. Gender significantly moderated the relationship between perceived discrimination and alcohol use (p <.05; see Table 9), such that, at moderate levels of perceived discrimination, women had greater alcohol use than men did. However, at high levels of perceived discrimination, men had greater alcohol use than women (see Figure 2). The relationship between neighborhood risk and drug use was significantly moderated by gender (p = .03; see Table 10), such that the association of increased neighborhood risk to increased drug use was stronger for men than for women (see Figure 3). Lastly, the relationship between financial problems and alcohol use was significantly moderated by nativity (p <.05; see Table 11), such that those born in the US had increased alcohol use as financial problems increased, but foreign born participants had a slight decrease in alcohol use as financial problems increased (see Figure 4).

Post-Hoc Analyses

Given the immigrant paradox and the potential for nativity (i.e., foreign-born vs. born in the U.S.) to serve as a confounding variable, nativity was entered into each model as an additional control in post-hoc analyses. Doing so did not result in changes to the marijuana use

model. However, entering nativity as an additional control variable resulted in slight changes to the drug and alcohol use models. When controlling for nativity, discrimination was no longer significant predictor of drug use ($p = .13$). However, financial problems became a significant predictor of drug use ($p = .05$), such that an increase in financial problems associated with an increase in levels of drug use. Interestingly, financial problems initially predicted alcohol use, but failed to remain a significant predictor after controlling for nativity.

Spurious significant results may have been obtained at the significance level of 0.05 due to the influence of a large sample size (Royall, 1986) and multiple hypothesis tests, which can increase the likelihood of false positive results (Roback & Askins, 2005). As such, a more stringent alpha value of 0.01 (Berg & Latin, 2008, p. 111) was used to further assess the significance of findings obtained the in the regression models. The finding that perceived discrimination significantly predicted greater odds of drug use was no longer supported at the $p = .01$ level. Additionally, gender and nativity were not supported as moderators of the relationship between stress indicators and substance use outcomes at the $p = .01$ level. All other findings remained significant at the $p = .01$ level.

Discussion

This study examined acculturative and general life stressors as predictors of substance use among Black Caribbean Americans, thereby expounding on the limited research on substance use in this population. It was hypothesized that, controlling for gender and age, the general stress variables (i.e., family problems, financial problems, neighborhood risk) and the acculturative stress variables (i.e., separation from family and perceived discrimination) would significantly predict drug and alcohol use. This study also examined mastery as a moderator of

the stress-substance use relationship and hypothesized that the relationship between stress variables and substance use would vary based on level of mastery.

Results from the current study revealed partial support for the first hypothesis. Neighborhood risk (measured as the frequency of crime and the selling of drugs within the neighborhood) and perceived discrimination were the only stress variables to significantly predict drug use, and both predicted higher levels of drug use. Perceived discrimination (predictive of both light and moderate alcohol use), financial problems (predictive of light alcohol use), and family problems (predictive of heavy alcohol use) were the only stress variables to significantly predict alcohol use. Aside from demographic variables, there were no significant predictors of marijuana use within12 months pre-assessment, specifically among those who endorsed lifetime use of marijuana.

The finding that neighborhood risk associated with higher levels of drug use among Black Caribbean Americans is consistent with previous literature on ethnic minority drug use. Strong support exists for the positive association between neighborhood context (e.g., poverty, selling/using of drugs, and crime) and drug, alcohol, and tobacco use among urban adolescent (Corneille & Belgrave, 2007; Crum, Lillie-Blanton, & Anthony, 1996; Lambert, Brown, Phillips, & Lalongo, 2004) and adult ethnic minorities (Boardman et al., 2001). This effect exists largely due to greater exposure to drugs and greater potential for interaction with drug users and sellers in urban or inner-city neighborhoods (Crum, Lillie-Blanton, & Anthony, 1996).

The Social Strain Theory may also explain the relationship between neighborhood risk and drug use. Social strain is defined as the tension a person experiences when others (either of the same race/culture or not) prevent, or threaten to prevent, him/her from obtaining a valued resource or goal. Social strain may also be experienced in the face of continuous interaction with

hurtful stimuli, such as crime, insult or discrimination (Agnew, 1992). Individuals may use drugs to reduce, or exert control over, the emotional turmoil (e.g., fear, anger, hopelessness) that may accompany their stressed state. Since drugs and alcohol may be used to cope with social stressors such as neighborhood crime and drug availability, interventions targeting healthy coping with these stressors may prove helpful in reducing drug use among Black Caribbean Americans, particularly those in urban or inner-city environments.

Perceived discrimination also had a positive association with drug and alcohol use among Black Caribbean Americans. This finding is largely consistent with existing literature that indicates a strong positive association between discrimination and substance use among ethnic minorities. For example, a study of drug use among Filipino American adults revealed that chronic and acute racial discrimination related to increased prescription, alcohol, and illicit drug use (Gee, Delva, & Takeuchi, 2007). Studies also indicate a strong positive association between discrimination and marijuana, tobacco, and alcohol use among Black adolescents and adults (Borrell, Jacobs, Williams, Pletcher, & Houston, 2006; Landrine & Klonoff, 1996; Terrell, Miller, Foster, & Watkins, 2006). These findings, in conjunction with the findings of this study, suggest it may be beneficial to address issues of discrimination by educating Black Caribbean Americans on healthier coping strategies for discrimination. This may be best achieved within a community based intervention, which would allow for wider dissemination of coping strategies than individual or small group interventions.

Financial problems (i.e., difficulty paying bills and worry about paying bills) and family problems (i.e., negative family interactions such as making too many demands, taking advantage, and being critical) predicted light and heavy levels of alcohol use, respectively. This is consistent with literature that indentified financial and family problems as significant predictors of

substance use among American adults (Pierce, Frone, Russell, & Cooper, 1994; Shaw, Agahi, & Krause, 2011; Whisman, Uebelacker, & Bruce, 2006). These findings suggest that reducing financial stress and family problems through intervention (e.g., financial counseling or family therapy) could reduce alcohol use among Black Caribbean Americans.

Interestingly, the stress variables differentially predicted substance use. While neighborhood risk significantly predicted drug use, it did not predict marijuana use (within 12 months pre-assessment among those who endorsed lifetime use) or alcohol use. This finding is unexpected and contrary to research (Boardman et al., 2001; Corneille & Belgrave, 2007; Crum, Lillie-Blanton, & Anthony, 1996; Lambert, Brown, Phillips, & Lalongo, 2004) that indentified neighborhood crime, poverty, and drug availability as risk factors for alcohol and drug use (including marijuana) among urban ethnic minorities. Future research should seek to better understand the relationship between neighborhood risk and substance use among Black Caribbean Americans.

Family separation did not significantly predict any of the substance use outcomes. The low level of family separation endorsed in this sample ($M = 2.00$ [$SD = 1.18$]) suggests that participants had frequent contact with relatives, which may have influenced this finding. The family separation item assessed the frequency of seeing, writing, and talking on the phone with family members. Advances in technology provide countless ways of contacting loved ones abroad, which may contribute to the low level of family separation in this sample. Future studies should examine this relationship in a sample of newly (i.e., in the U.S. five years or less) immigrated Black Caribbean Americans, who may be less likely to have family in the country, support systems in place, and (consistent) access to the technological advances that exist.

Unfortunately, this sample only consisted of 11%, of newly immigrated Black Caribbean Americans.

The second hypothesis posited mastery as a significant moderator of the relationship between significant stress predictors and substance use. However, mastery did not moderate the relationship between any stress indicator and substance use as was projected. This finding is contrary to the desired outcome, but seems consistent with some existing research on the moderating effects of psychological resources (such as mastery) on stress and drug use. For example, in a prior study of neighborhood disadvantage and drug use, the psychological resources of self-esteem and mastery had little to no effect on the relationship between neighborhood disadvantage and drug use among Black adults (Boardman et al., 2009). While mastery did not moderate the relationship between stress and substance use, it moderated the relationship between age and marijuana use. The finding that high mastery related to greater, rather than lower, marijuana use among younger participants was intriguing. This suggests that high mastery may relate to adverse outcomes for this group. It is possible that young adults, who may have a sense of invincibility or inflated self-confidence, may not fully appreciate the risks associated with drug use. Reasons such as this for the adverse effect of high mastery for this age group should be explored in future research.

Nativity and gender were assessed as moderators in subsequent analyses. Nativity significantly moderated the relationship between financial problems and alcohol use, such that participants born in the U.S. had higher levels of alcohol use as financial stress increased, but foreign-born participants had slightly lower alcohol use as financial stress increased. This finding speaks to the immigrant paradox that posits foreign birth as a protective factor against substance use among immigrants. Additionally, Black Caribbean Americans may come from

countries with extensive poverty and poor economic conditions. While they may continue to experience financial difficulty in the U.S., they may perceive that they are better off than they would have been in their country of origin. This may translate into better coping with financial distress compared to those born in the U.S. with similar levels of financial problems, but no experience from which they can draw a positive comparison.

The relationship between increased neighborhood risk and increased drug use was stronger for men than women. This finding suggests that Black Caribbean American men, who may be more exposed to neighborhood crime and drugs than their female counterparts, are more susceptible to the influence of neighborhood crime and drug availability on personal drug use than Black Caribbean American women. It is also possible that Black Caribbean American men use drugs to de-stress, relax, or otherwise cope with neighborhood stressors, more so than their female counterparts. These gender differences should be explored in future research.

The current study has several strengths. First, this study addressed a significant gap in the literature and was the first to examine non-demographic predictors (i.e., general and acculturative stressors) of drug and alcohol use in a sample of Black Caribbean Americans. Second, the sample was derived from the reputable National Survey of American Life (NSAL), a large national household survey of the physical and mental health of Black Americans (Jackson et al., 2004). Third, this study was the first to examine moderators (i.e., mastery, gender, and nativity) of the relationship between stress and substance use.

While there are several strengths to this study, the findings of this study must be interpreted in the context of several limitations. First, this study did not account for within group diversity among Black Caribbean Americans, as data from both foreign born and U.S. born participants were used in this study. Considerable differences in the acculturative experiences

between foreign born and U.S. born Caribbeans likely exist. Future studies should seek to tease apart within group differences related to acculturative stress predictors of substance use in this group. Second, while 45% of this sample endorsed lifetime drug use, only 12% endorsed drug use (mostly light to moderate use) within 12 months pre-assessment, which was the outcome of interest. This low percentage of use may be associated with the older age of this sample (M_{age} = 41 [SD = 15]) amongst other factors. Future studies should seek to identify predictors of substance use in a younger sample in which there is likely to be a higher prevalence of drug use, and perhaps more substantial drug use, than what was endorsed in this sample. Doing so may lead to more clinically relevant findings. Third, data on substance use was obtained via participant self-report; biological markers of substance use (e.g., blood, urine, or oral fluid tests) were not obtained for the NSAL sample due to survey methodology. Additionally, recall of substance use was not aided by measures such as the Timeline Follow Back (Sobell & Sobell, 1992) assessment, which has good psychometric properties and often provides a detailed and more accurate recall of substance consumption. While self-report data is often reliable and more feasible than obtaining biological markers of use, particularly in large studies (Babor, Steinberg, Anton, & Del Boca, 2000), corroborating self-report with results from biological tests would have been helpful.

Fourth, this study did not use established acculturative and general stress measures. While such constructs were measured with scales created from relevant survey items (which had acceptable reliability), it would have been best to utilize existing measures with established psychometric properties such as the Social, Attitudinal, Familism, and Environmental (SAFE; Mena et al., 1987) acculturative stress scale and the Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983). Future studies should seek to include these types of measures,

which will afford cleaner assessment of the constructs of interest and will allow for a comparison of findings between studies.

Despite these limitations, the current study makes important contributions to the literature. First, this study addressed a significant gap in the literature by examining non-demographic predictors of substance use in a Black Caribbean American sample (i.e., general and acculturative stressors), thereby shedding additional light on this important societal issue within this understudied ethnic group. Second, this study highlighted the importance of acknowledging the tremendous heterogeneity that exists within the Black community and examining substance use within particular Black ethnic groups, such as Black Caribbean Americans. Undoubtedly there are some commonalities between African American substance users and Black Caribbean American users. For example, neighborhood risk significantly predicted drug use for African Americans and, as we now know, for Black Caribbean Americans as well. However, substantial differences may exist. It behooves researchers to better understand substance use and predictors of use that are specific to the Black Caribbean American community, rather than assuming the African Americans findings are fully generalizable across Black ethnic groups.

Future research should seek to clarify and expound on the current findings by examining: (1) general and acculturative predictors of substance use using establish measures with excellent psychometric properties (such as the Perceived Stress Scale and the S.A.F.E acculturative stress measure), (2) mastery as a moderator of neighborhood risk in the context of drug abstinence and drug refusal skills and examining additional psychological resources as moderators of the stress-substance use relationship, such as self-esteem, (3) additional general and acculturative predictors of substance use (e.g., language proficiency [which may indicate access to social

resources such as employment]), (4) predictors of the onset of substance use in this population, and (5) whether findings would differ in a young adult sample or sample with fewer mean years in the U.S. Additionally, this study did not examine whether acute discrimination or chronic lifetime experiences of discrimination differentially predict drug use. Future research should seek to address these questions.

Summary and Conclusions

The current study assessed acculturative and general stressors as predictors of drug and alcohol use among Black Caribbean Americans and examined mastery as a moderator on the stress-substance use relationship. It was hypothesized that the acculturative and general stress variables would significantly predict substance use and that mastery would function as a moderator on the stress-substance use relationship(s).The findings of the current study revealed partial support for the first hypothesis, but no support for the second hypothesis.

Neighborhood risk and perceived discrimination were the only stress variables to significantly predict drug use in this sample of Black Caribbean Americans. Perceived discrimination, financial stress, and family problems significantly predicted different levels of alcohol use. Non-demographic variables did not significantly predict marijuana use in this study. Mastery did not moderate the relationship between stress and substance use in this study, but did moderate the relationship between age and marijuana use. Subsequent analyses indicated nativity and gender as significant moderators of the relationship between financial problems and alcohol use and neighborhood risk and drug use, respectively. These findings suggest that drug use interventions should target coping skills related to neighborhood crime, drug availability, discrimination, and family problems (such as negative interactions). Future research should seek

to clarify the findings of this study and explore additional general and acculturative stress variables as predictors of substance use among Black Caribbean Americans.

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Table 1

Sample Characteristics

Variables	N (%)	M (SD)
Age, M(SD)		41 (15.42)
Gender		
Female	853 (61)	
Male	550 (39)	
Education		
≤5 years	33 (3)	
6-8 years	59 (4)	
9-11 years	170 (12)	
12 years	412 (29)	
≥13 years	729 (52)	
Employment		
Employed	1042 (74)	
Unemployed	131 (10)	
Not in Labor Force	230 (16)	
Marital Status		
Married/Cohabitating	602 (43)	
Divorced/Separated	325 (23)	
Never Married	476 (34)	
Nativity*		
U.S. Born	367 (26)	
Foreign Born	1023 (74)	
Years in the U.S.*		
≤ 5 years	116 (11)	
5- 10 years	160 (16)	
11- 20 years	330 (32)	
>20 years	417 (41)	
Country of Origin		
Jamaica	502 (36)	

Haiti	290 (21)
Trinidad & Tobago	164 (12)
Other	431 (31)
U.S. Citizen*	
Yes	575 (41)
No	432 (31)
Region of Residence	
Northeast	968 (69)
Midwest	10 (1)
South	412 (29)
West	13 (1)

*N= 1390

Table 2

Descriptive Statistics for the Predictor and Moderator Variables

	N	M (SD)	Potential/Actual Range
Family Problems	1374	5.63 (2.24)	3 - 12
Financial Problems	1389	4.22 (1.97)	2 - 9
Neighborhood Risk	1292	4.72 (1.86)	2 – 9
Separation from Family	1393	2.00 (1.18)	1 – 7
Perceived Discrimination	1351	21.64 (8.66)	10 - 60
Mastery	1388	15.33 (3.70)	5 - 20

Table 3

Summary of Drug and Alcohol Use

	Alcohol	Marijuana	Cocaine	Abuse of Prescriptions	Other
Lifetime Use, N (%)					
Yes	1109(81)	452 (32)	83 (6)	57 (4)	45 (3)
No	258 (19)	950 (68)	1319 (94)	1346 (96)	1358 (97)
Use in Past Year, N (%)*					
Yes	660 (86)	124 (9)	10 (1)	7 (1)	10 (1)
No	110 (14)	1279 (91)	1393 (99)	1396 (99)	1393 (99)
Frequency of Use in Past Year, N (%)					
Every Day	47 (7)	27 (22)	0 (0)	0 (0)	0 (0)
3 – 4 Days/Week	43 (6)	22 (18)	1 (10)	1 (14)	1 (10)
1 – 2 Days/Week	136 (21)	21 (17)	3 (30)	0 (0)	4 (40)
1-3 Days/Month	178 (27)	25 (20)	3 (30)	3 (43)	0 (0)
< Once/Month	256 (39)	29 (23)	3 (30)	3 (43)	5 (50)
Age of First Use, M (SD)	17 (5.80)	18 (5.67)	21 (4.88)	17 (9.19)	22 (10.39)
Drinks per day, M (SD)	2 (2.00)				
Level of Use, N (%)	Alcohol	Marijuana	Drug Use		
No Use	368 (36)	328 (72)	1267 (90)		
Light	434 (42)	54 (12)	60 (4)		
Moderate	179 (17)	43 (10)	49 (4)		
Heavy	47 (5)	27 (6)	27 (2)		

* N = 770 for frequency of alcohol use due to missing data on this variable.

Table 4

Correlations between the Predictors and Substance Use Outcomes

	Drug Use	Alcohol Use[†]	Marijuana Use[‡]
Gender	-	-	-
Age	-.20**	-.12**	-.30**
Family Problems	.09**	.10**	.12**
Financial Problems	.07**	-.04	.08
Neighborhood Risk	.14**	.03	.15**
Separation from Family	.03	.07	.00
Perceived Discrimination	.16**	.16**	.15**
Mastery	-.01	-.05	-.02

*$p \leq .05$; **$p \leq .01$; [†]N=770; [‡]N= 452

Table 5

Ordinal Regression Model for Drug Use

	B	SE	OR	95% CI Lower- Upper
Male	1.26**	.74	3.51	2.31 – 5.33
Age	-.05**	.01	.95	.94 - .97
Family Problems	.04	.05	1.04	.95 – 1.13
Neighborhood Risk	.19**	.07	1.21	1.09 – 1.35
Financial Problems	.08	.06	1.08	.98 – 1.20
Perceived Discrimination	.02*	.01	1.02	1.00 – 1.05
Separation from family	.02	.08	1.02	.97 – 1.19

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

Table 6

Multinomial Logistic Regression Model for Alcohol Use

	Light Use		Moderate Use		Heavy Use	
	RRR	CI, Lower-Upper	RRR	CI, Lower-Upper	RRR	CI, Lower-Upper
Male	1.32	.97 – 1.80	3.33**	2.24 – 4.95	7.12**	3.23 – 15.69
Age	.98**	.97 - .99	.98**	.97 - .99	1.00	.98 – 1.02
Perceived Discrimination	1.03**	1.01 – 1.05	1.02*	1.00 – 1.05	1.02	.98 – 1.06
Financial Problems	.92*	.86 - .99	.95	.86 – 1.05	.97	.82 – 1.14
Family Problems	1.00	.93 – 1.07	1.02	.933 – 1.12	1.26**	1.09 – 1.45
Separation from Family	.97	.85 – 1.10	.99	.84 – 1.16	1.13	.89 – 1.44
Constant	1.82	.83 – 4.01	.41	.15 – 1.14	.00	.00 - .03

*$p \leq .05$; **$p < .01$ † The levels of alcohol use are "no use," light use, moderate use, and heavy use, with "no-use" as the reference category.

Table 7

Ordinal Regression Model for Marijuana Use

	B	SE	OR	95% CI
Male	.96**	.66	2.61	1.59 – 4.27
Age	-.07**	.01	.94	.92 - .96
Family Problems	.03	.05	1.03	.93 – 1.14
Neighborhood Risk	.12	.07	1.13	.99 – 1.28
Perceived Discrimination	.01	.01	1.01	.98 – 1.04
Financial Problems	.04	.06	1.04	.92 – 1.04

*p<.05; **p<.01

Table 8

Marijuana Use Model Containing the Mastery by Age Interaction[†]

	B	SE	OR	95% CI
Male	1.02**	.66	2.76	1.67 – 4.55
Age	-.07**	.01	.94	.92 - .96
Family Problems	.04	.05	1.03	.94 – 1.14
Neighborhood Risk	.12	.07	1.13	.99 – 1.28
Perceived Discrimination	.01	.01	1.01	.98 – 1.04
Financial Problems	.06	.07	1.06	.93 – 1.21
Mastery	.01	.04	1.01	.94 – 1.08
Mastery X Age	-.01**	.00	.99	.00 - 1.00

*p<.05; **p<.01 [†]All continuous variables were centered for analysis

Table 9

Alcohol Use Model Containing the Gender by Perceived Discrimination Interaction[†]

	Light Use		Moderate Use		Heavy Use	
	RRR	CI, Lower-Upper	RRR	CI, Lower-Upper	RRR	CI, Lower-Upper
Male	1.32	.96 – 1.80	3.31**	2.22 – 4.92	7.02**	3.18 – 15.56
Age	.98**	.97 - .99	.98**	.97 - .99	1.00	.98 – 1.02
Perceived Discrimination	1.05**	1.01 – 1.08	1.05**	1.01 – 1.08	1.04	.96 – 1.13
Financial Problems	.92*	.85 - .99	.95	.86 – 1.05	.97	.82 – 1.14
Family Problems	1.01*	.93 – 1.08	1.02	.94 – 1.13	1.26**	1.09 – 1.45
Separation from Family	.99	.85 – 1.10	.99	.84 – 1.16	1.13	.89 – 1.44
Perceived Discrimination X Male	.96*	.93 – 1.00	.96*	.91 – 1.00	.97	.88 – 1.06
Constant	1.82	.83 – 4.01	.41	.15 – 1.14	.00	.00 - .03

*p<.05; **p<.01 † All continuous variables were centered for analysis. The levels of alcohol use are "no use," light use, moderate use, and heavy use, with "no-use" as the reference category.

Table 10

Drug Use Model Containing the Gender by Neighborhood Risk Interaction[†]

	B	SE	OR	95% CI Lower- Upper
Male	1.11**	.67	3.04	1.98 – 4.68
Age	-.05**	.01	.95	.94 - .97
Family Problems	.03	.05	1.03	.95 – 1.13
Neighborhood Risk	.05**	.09	1.05	.89 – 1.24
Financial Problems	.09	.06	1.09	.98 – 1.21
Perceived Discrimination	.02*	.01	1.02	1.00 – 1.05
Separation from family	.02	.08	1.02	.87 – 1.19
Male X Neighborhood Risk	.24*	.14	1.27	1.02 – 1.57

*p<.05; **p<.01 [†]All continuous variables were centered for analysis

Table 11

Alcohol Use Model Containing the Nativity by Financial Problems Interaction[†]

	Light Use		Moderate Use		Heavy Use	
	RRR	CI, Lower-Upper	RRR	CI, Lower-Upper	RRR	CI, Lower-Upper
Male	1.39*	1.01 – 1.89	3.58**	2.39 – 5.36	7.44**	3.36 – 16.44
Age	.98**	.97 - .99	.98**	.97 - .99	1.00	.98 – 1.03
Perceived Discrimination	1.02**	1.01 – 1.04	1.01**	.99 – 1.04	1.01	.97 – 1.06
Financial Problems	.91*	.84 - .99	.92	.81 – 1.03	.95	.78 – 1.15
Family Problems	.99	.92 – 1.06	1.01	.92 – 1.10	1.24**	1.08 – 1.44
Separation from Family	.97	.85 – 1.10	.99	.84 – 1.16	1.13	.89 – 1.44
Nativity [U.S.]	2.01**	1.39 – 2.91	2.45**	1.56 – 3.85	1.93	.92 – 1.07
Nativity [U.S.] X Fin. Problems	1.22*	1.01 – 1.49	1.33*	1.05 – 1.69	1.23	.85 – 1.80
Constant	.90	.72 – 1.11	.22	.15 – .30	.03	.01 - .06

*p<.05; **p<.01 [†]All continuous variables were centered for analysis. The levels of alcohol use are "no use," light use, moderate use, and heavy use, with "no-use" as the reference category.

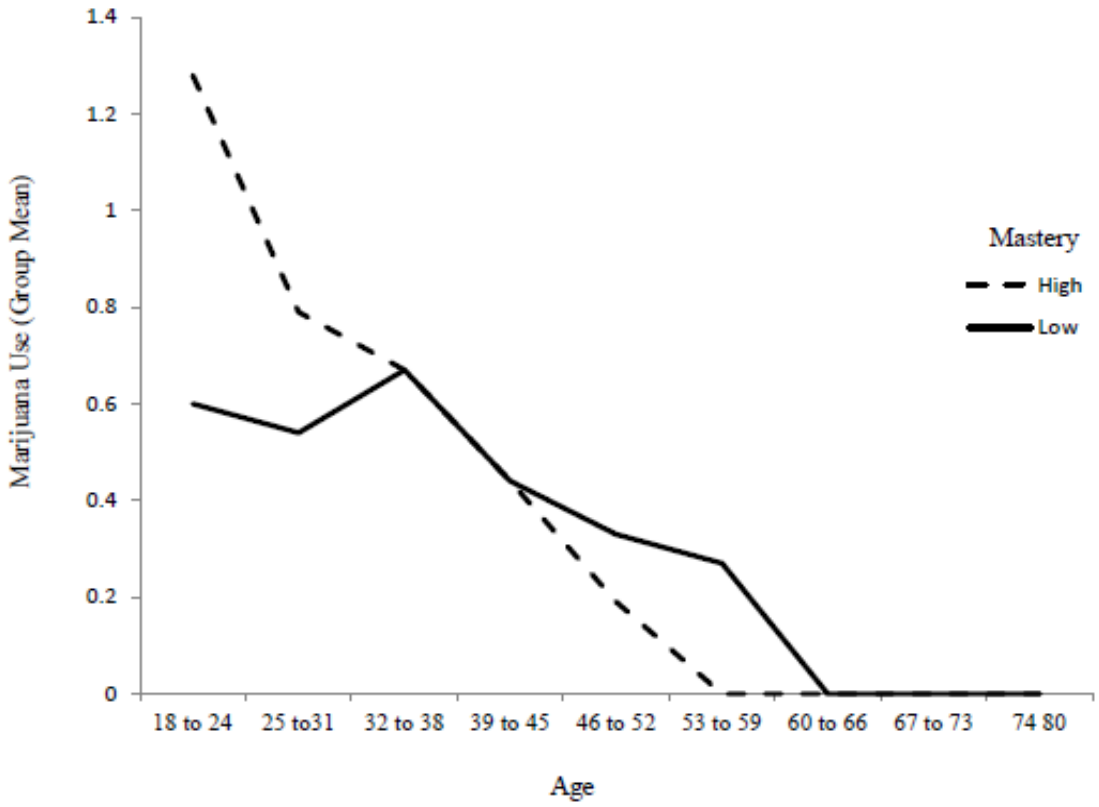

Figure 1. Moderation of the relationship between age and marijuana use by mastery. Mastery was dichotomized into high/low category using median split technique.

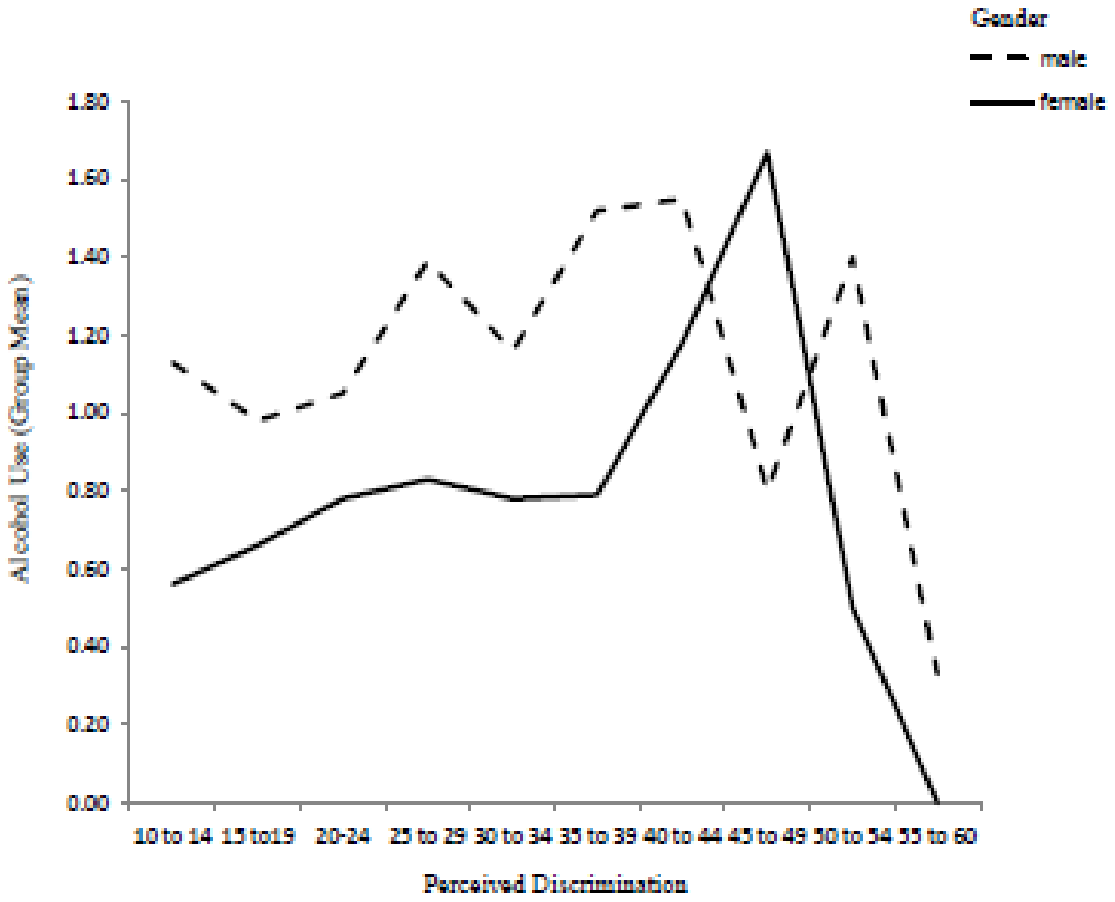

Figure 2. Moderation of the relationship between discrimination and alcohol use by gender.

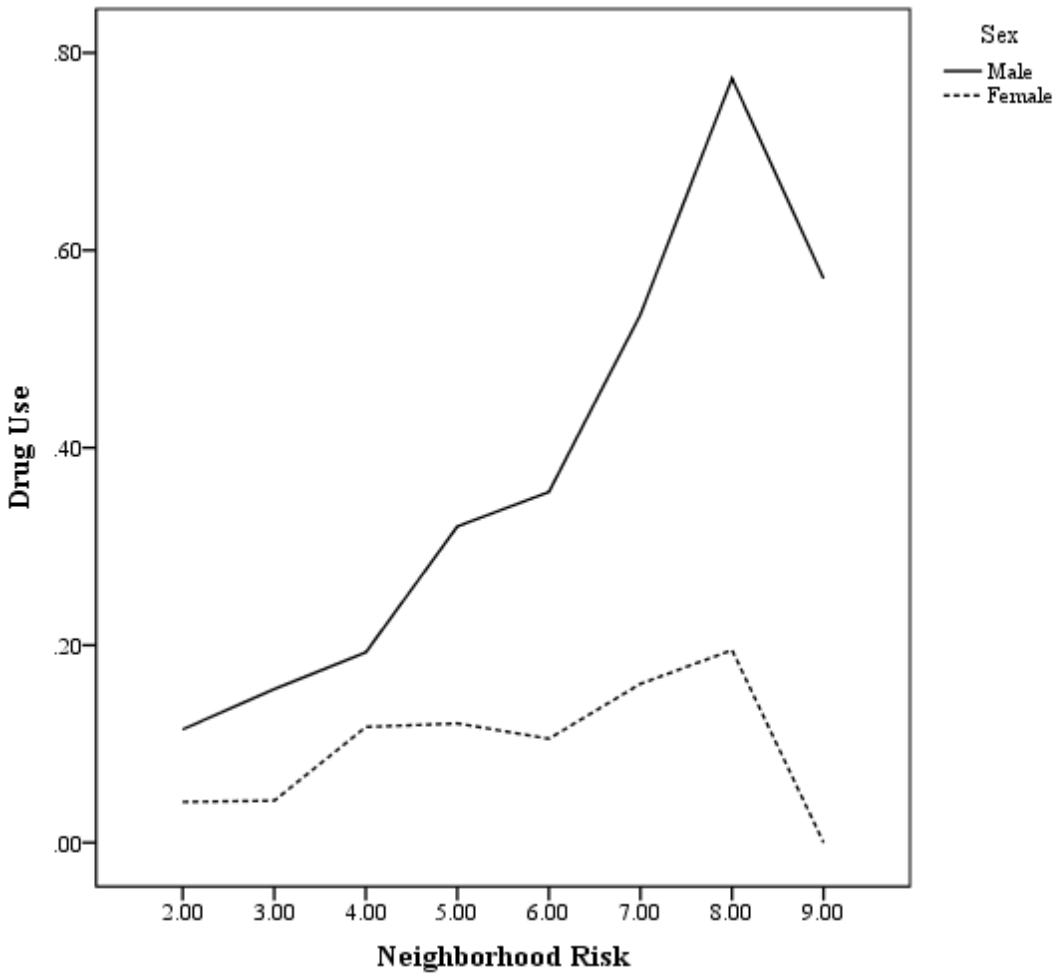

Figure 3. Moderation of the relationship between neighborhood risk and drug use by gender.

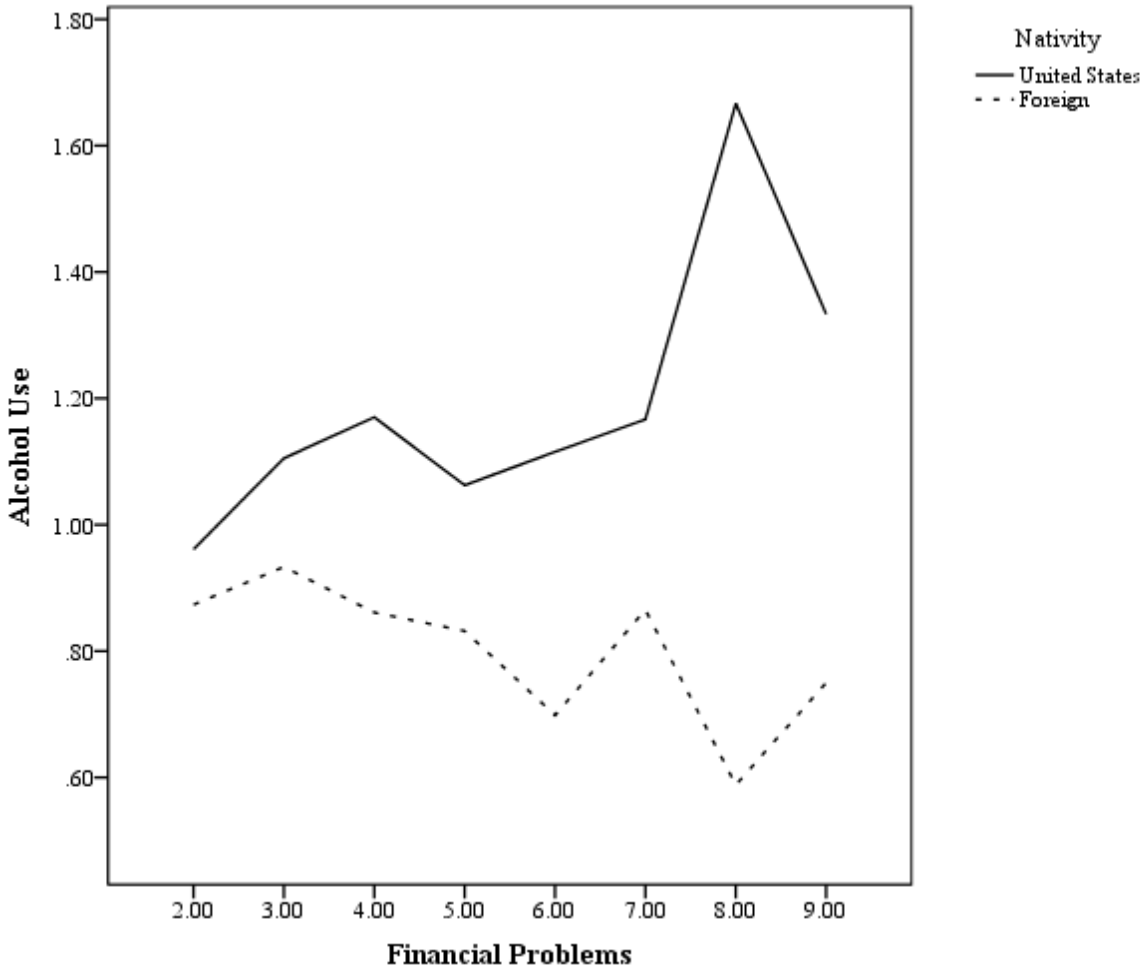

Figure 4. Moderation of the relationship between financial problems and alcohol use by nativity.