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Abstract

This study investigated the effects of personality type and ethnicity on reactivity to stressful stimuli by examining acculturation and adherence to Asian American cultural values as moderators. Twenty-two Asian American and twenty-two European American students performed a mental arithmetic task and a speech task while cardiovascular (CV) reactivity was monitored. Level of extraversion, acculturation, and adherence to Asian American values were assessed. As predicted, Asian Americans exhibited less CV reactivity to stressful stimuli and lower levels of extraversion than European Americans. Support was found for adherence to Asian American values as a moderator of the relationship between level of extraversion and CV reactivity to stressful stimuli. The results illustrate that being connected to Asian American culture has protective value for less extraverted individuals, as adherence to Asian American values predicted less CV reactivity to stress. These findings shed light on how culture influences the form and function of personality and can influence physiological reactivity to stress. To the best of my knowledge, no research has investigated whether personality type has an effect on stress responses in Asian Americans and examined the differences in responses based on cultural adherence.

The Effects of Adherence to Asian Values and Extraversion on Cardiovascular Reactivity: A Comparison Between Asian and European Americans

Personality is shaped in many ways and has countless influences including social, cultural, and biological. Past research has illuminated differences amongst extraverts and introverts in the area of stress response (Fowles, Roberts, & Nagel, 1977; Hinton & Craske, 1977; Kaiser, Hinton, Krohne, Stewart, & Burton, 1995; Sipprelle, Ascough, Detrio, & Horst, 1977). However, no research, to the best of my knowledge, has investigated whether personality type has an effect on stress responses in Asian Americans and examined the differences in responses based on cultural adherence. Thus, the current study aims to examine the effects of acculturation, adherence to Asian American values, and level of extraversion on CV reactivity in response to stressful stimuli.

A common model to describe personality is the Five Factor Model, which proposes that openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism comprise the fundamental architecture of personality traits (Costa & McCrae, 1985; John, Donahue, & Kentle, 1991). This study focuses on the extraversion/introversion dimension, which consists of several facets, including gregariousness, assertiveness, activity, excitement-seeking, positive emotions, and warmth. Jung (1971) proposed that extraverts and introverts differ fundamentally in their relations to the world. According to Jung (1971), the introvert reflects on and internalizes potential conflicts between the self and the world, whereas the extravert acts upon the world and seeks to reduce potential conflicts between the self's goals and current reality (Brebner & Cooper, 1978). From this perspective, introverts are more reflective and harmonious, whereas extraverts are more active and individualistic.

There are both universal and culture-specific aspects of variation in personality (Triandis & Suh, 2002). A cross-cultural perspective on personality accepts the universality of personality traits, such as extraversion, but also argues that culture influences patterns of behavior including the form and function of personality (Markus & Kitayama, 1991; Triandis & Suh, 2002). Research suggests that Asian Americans are less likely than their European American counterparts to be extraverted and that this difference may be due to differing cultural values (Oyserman, Coon, & Kemmelmeier, 2002; Song & Kwon, 2012). Abe and Zane (1990) found that foreign-born Asians had lower levels of extraversion than American-born Asians and that both groups of Asians (foreign and American-born) had lower levels of extraversion than European Americans. Similarly, Mooradian and Swan (2006) found that extraversion scores differed nationally and that Chinese and Japanese individuals scored lower in extraversion than American individuals. These cultural differences in levels of extraversion reflect larger cultural values regarding individualism and collectivism. Broadly put, American values favor extraversion more and Asian values favor extraversion less (Abe & Zane, 1990). Asian cultures tend to emphasize collectivism, whereas individualism is highly regarded in America (Safdar et al., 2009). In Western cultures, children are taught to attend to the self, to appreciate one's difference from others, and to understand the importance of asserting the self (Markus & Kitayama, 1991). In many Eastern cultures or Asian cultures, children are taught to attend to fitting in with others and to understand the importance of harmonious interdependence (Markus & Kitayama, 1991). For those with interdependent construals of the self, both the expression and the experience of emotions and motives may be significantly shaped and governed by a consideration of the reactions of others (Markus & Kitayama, 1991). Introverts display reflective and non-assertive qualities that are similar to values emphasized and respected in

Asian cultures, which may explain why Asians and Asian Americans score lower in extraversion and higher in interdependence and collectivism than European Americans (Abe & Zane, 1990; Markus & Kitayama, 1991; Safdar et al., 2009; Triandis & Suh, 2002).

Research suggests that physiological reactivity to laboratory stressors is influenced by level of extraversion (Hinton & Craske, 1977; Fowles et al., 1977; Kaiser et al., 1995). Hinton and Craske (1977) observed that introverts showed a greater increase in heart rate relative to extraverts when performing a mental task, illustrating that introverts had greater CV reactivity in response to stress than did extraverts. Stelmack and Mandelzys (1975) showed that introverts had a larger mean increase in pupil diameter from prestimulus conditions than did extraverts. According to Lowenstein and Lowenfeld (1969), pupil diameter indicates a threat response. Thus, the results of Stelmack and Mandelzys (1975) can be interpreted as an indication that introverts show greater reactivity to perceived threats, as indicated by a greater papillary threat response. Little research has been conducted recently to confirm these findings. As such, the current study aims to further this research and investigate whether these findings are still relevant.

Understanding that Asians generally display lower levels of extraversion relative to European Americans and that lower levels of extraversion have been associated with greater CV reactivity, it seems possible that Asians would be more likely to display greater CV reactivity than European Americans. However, Shen, Stroud, and Niaura (2004) found that Asian Americans showed reduced CV reactivity to laboratory stressors when compared to European Americans. The study done by Shen et al. (2004) is the only study to my knowledge that directly compared CV stress responses between Asian and European Americans and it focused only on ethnicity and not on acculturation. Acculturation occurs when two or more cultures interact; it is

the process of cultural and psychological change that results from the meeting of cultures (Suinn, Rickard-Figueroa, Lew, & Vigil, 1987). Cultural factors may explain ethnic differences in personality type (level of extraversion) and physiological reactivity to stress. The current study assessed level of acculturation and adherence to Asian American values to investigate whether maintaining Asian cultural values has an influence on level of extraversion and stress reactivity in Asian Americans.

Kim, Li, and Ng (2005) identified five values that are emphasized in Asian cultures: collectivism, conformity to norms, emotional self-control, family recognition through achievement, and humility. Cultures differ in how they encourage and reinforce emotional responding, resulting in differences in which emotional responses are appropriate under what circumstances (Kitayama, Markus, & Kurokawa, 2000; Markus & Kitayama, 1991; Matsumoto, 1990). Asian cultures often hold beliefs about the proper display of emotions (Kitayama et al., 2000; Markus & Kitayama, 1991; Matsumoto, 1990), which may impact level of extraversion and reactivity to stress. The cultural norms surrounding expressions such as happiness, sadness, anger, and fear differ from American norms. Safdar et al. (2009) found that Japanese cultural norms permit the expression of powerful emotions such as anger, contempt, and disgust significantly less than American and Canadian cultural norms. In addition, individuals in the Japanese sample generally felt they should express positive emotions, like happiness and surprise, significantly less than individuals in the Canadian sample. The Asian value of emotional self-control may play a role in personal expression as well as stress reactivity.

Collectivistic cultures, such as, Japanese culture value groups over individuals and promote harmony and cooperation within the group rather than individual assertion (Markus & Kitayama, 1991). Emotions are seen more as interactive experiences reflecting the social context

rather than the inner self. The culture demands control over the expression of emotion because it is the basis for forming an assessment of the relationship between the self and others (Mesquita, 2001). Collectivistic cultures mainly emphasize the maintenance of cohesion within the group and therefore, control of emotion holds a high precedence (Markus & Kitayama, 1991; Mesquita, 2001). In individualistic cultures, the individual is viewed as the most important social element. Such cultures value and promote independence, competitiveness, and uniqueness (Chen & West, 2008). Emotions are viewed as important personal experiences. In these cultures, emotions are seen as inner states that are expressed impulsively. For example, in American culture, expressions of emotion are viewed as expressions of individuality and encouraged as outward displays (Matsumoto, Takeuchi, Andayani, Kouznetsova, & Krupp, 1998). They are often exaggerated to strengthen the sentiment behind them. Kitayama et al. (2000) found that subjective well-being and positive feelings were associated with interdependence and interpersonal engagement for Japanese, but with independence and interpersonal disengagement for Americans.

Butler, Lee, and Gross (2007) found that for Americans holding Western European values, habitual emotional suppression was associated with self-protective goals and negative emotion. Experimentally elicited emotional suppression resulted in reduced interpersonal responsiveness during face-to-face interaction, negative perceptions of partners, and hostile behavior. These deleterious effects were lesser when individuals holding Asian values suppressed emotions, and these disparities were mediated by cultural differences in the responsiveness of the suppressors, suggesting that the negative social impacts of emotional suppression may be moderated by cultural values. The current study assessed level of

individualism and collectivism as well as emotional self-control to investigate whether they had an influence on stress reactivity and level of extraversion.

This study aimed to extend the literature on effects of personality type and ethnicity on reactivity to stress by examining acculturation and adherence to cultural values as moderators of relationships between these variables. Based on the findings of Shen et al. (2004), I hypothesize that Asian Americans will illustrate less CV reactivity in response to stressful stimuli than European Americans. Based on the findings of Abe and Zane (1990), I hypothesize that Asian Americans will have lower levels of extraversion than European Americans. Further, I hypothesize that level of acculturation will moderate the effect of extraversion on CV reactivity in Asian Americans.

Method

Participant Characteristics

Participants were 44 undergraduate students attending one of the Claremont Colleges between the ages of 18 and 23 (*M=20.55, SD=1.37*). Participants were 68.2% female and 31.8% male. Participants were 50% Asian American and 50% European American. The majority of Asian American participants self-identified as being Japanese (27.27%) or Chinese (27.27%), followed by Korean (18.18%), Taiwanese (9.09%), Vietnamese (9.09%), Taiwanese-Singaporean (4.55%), and Chinese-Vietnamese (4.55%). The majority of European American participants were Western European, but many did not know specifics about their ethnic backgrounds. Students were recruited via email, a psychology experiments group online, and psychology courses at Pitzer College. All participants signed informed consent forms before participating in the study. Each participant was entered into a raffle to win one of ten $25 gift cards as an incentive and Introductory Psychology students received extra credit for

participating. This study was approved by the Pitzer College Institutional Review Board (IRB) on February 6, 2014.

Laboratory Stressors

Each participant completed a mental arithmetic stress task. Using the procedure outlined by Hinton and Craske (1977), the researcher explained that a quick assessment of performance on a rapid mental test was needed to allow comparison with other participants. It was casually mentioned that the other participants found the task easy. The participant was then informed that the task was to count backward from 2,193 in sevens as quickly and accurately as possible. Unless the participant had questions, he or she was told to begin as soon as the instructions were given. If the participant made a mistake, the researcher responded by saying, "That was incorrect, please start again." If the participant gave up in confusion or paused, the researcher responded by saying, "Please continue." After five minutes of this task, the researcher instructed the participant to relax.

Once the arithmetic stress task was completed, the participant completed a four-minute speech on the topic "What you like and dislike about your body and physical appearance". Following the procedure outlined by Shen et al. (2004), the participant was given two minutes to prepare. During the instruction period, the participant was informed that at the end of a countdown, they were to look into a video camera positioned in front of them and begin the speech. If the participant did not have any questions, he or she was instructed to begin and the researcher left the room. After three minutes, the participant was cued to end the speech. At the end of four minutes, the researcher returned and instructed the participant to relax. Although the participant was told the video camera was recording the speech, the camera was never turned on. The participant was debriefed about this deception once the entire session was complete.

Self-report Measures

Level of extraversion was assessed using the 44-item Big Five Inventory (BFI). The purpose of the BFI is to assess the five personality dimensions of extraversion, agreeableness, conscientiousness, neuroticism, and openness. The 44-item BFI was developed by John et al. (1991) and was constructed to allow efficient and flexible assessment of the five personality dimensions. Only the extraversion dimension was examined in the current study. Participants rated each BFI item on a 5-point Likert scale ranging from 1 (disagree strongly) to 5 (agree strongly). Sample items include: "I see myself as someone who is full of energy" and "I see myself as someone who is sometimes shy, inhibited".

The dimensions of individualism and collectivism were assessed using the Individualism and Collectivism Measure. The Individualism and Collectivism Measure assesses the three facets of individualism (independence, competitiveness, and uniqueness) and the three facets of collectivism (consideration of the implication of one's decisions on others, sharing the success of others, and sharing the failures of others). The Individualism and Collectivism Measure was developed by Chen and West (2008). Participants rated each item on a 9-point Likert scale ranging from 1 (strongly disagree) to 9 (strongly agree). Sample items include: "I don't like to rely on other people" and "When making decisions, it is important for me to take my parents' needs into account".

Adherence to Asian American cultural values was assessed using the 42-item Asian American Values Scale—Multidimensional (AAVS-M). The AAVS-M is made up of five subscales: collectivism, conformity to norms, emotional self-control, family recognition through achievement, and humility. The AAVS-M was developed by Kim et al. (2005) to measure the value dimensions that represent values that differentiate Asian Americans and European

Americans and therefore reflect values enculturation. Participants rated each AAVS-M item on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Sample items include: "The welfare of the group should be put before that of the individual" and "One's emotional needs are less important than fulfilling one's responsibilities".

Asian American acculturation was assessed using the Asian American Multidimensional Acculturation Scale (AAMAS). The AAMAS assesses cultural identity, language, cultural knowledge, and food consumption. The AAMAS was developed by Gim Chung, Kim, and Abreu (2004) to measure the bidimensionality of Asian American acculturation. Participants rated each AAMAS item on a 6-point Likert scale ranging from 1 (not very much) to 6 (very much). Sample items include: "How much do you interact and associate with people from your culture of origin" and "How knowledgeable are you about the culture and traditions of your culture of origin".

The Stigma-Consciousness Questionnaire for Race/Ethnicity (SCQ-R) was used to assess how sensitive participants were to being stereotyped. The questionnaire was developed by Pinel (1999) to assess the extent to which participants expected to be stereotyped as a result of their race/ethnicity. Participants rated each SCQ-R item on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Sample items include: "I almost never think about my race/ethnicity when I interact with Whites" and "Stereotypes about people of my race/ethnicity have not affected me personally".

The Brief COPE, an abbreviated version of the COPE Inventory, was used to assess how participants cope with stress. This assessment of coping strategies was developed by Carver (1997). Minor wording changes were made to make the assessment sound less clinical. Participants rated each Brief COPE item on a 4-point Likert scale ranging from 1 (I don't do this

at all) to 4 (I do this a lot). Sample items include: "I turn to work or other activities to take my mind off things" and "I get help and advice from other people".

State anxiety was assessed using the State-Trait Anxiety Inventory (STAI) developed by Spielberger, Gorsuch, and Lushene (1970). The STAI assessed present feelings of anxiety and was given before and after the stress tasks. Participants rated each STAI item on a 4-point Likert scale ranging from 1 (not at all) to 4 (very much so). Sample items include: "I feel secure" and "I feel upset".

Positive and negative affect were assessed using the Positive and Negative Affect Scale (PANAS) developed by Watson, Clark, and Tellegen (1988). The PANAS assessed present positive and negative feelings and emotions and was given before and after the stress tasks. Participants rated each PANAS item on a 5-point Likert scale ranging from 1 (very slightly or not at all) to 5 (extremely). Sample items include: "I feel interested" and "I feel nervous".

Biological Measures

Systolic blood pressure (SBP), diastolic blood pressure (DBP), and heart rate (HR) were measured using BIOPAC equipment. The researcher placed an arm and a finger cuff on the participant. Participants were monitored upon arrival, for the duration of both stress tasks, and up until five minutes after the stress tasks.

Procedure

Undergraduate students were recruited via email, a psychology experiments group online, and psychology courses at Pitzer College. Students were asked to fill out an informed consent form and then to complete the 44-item BFI to assess personality. After completing the inventory, participants were asked to report demographics and contact information. Those who self-identified as Asian American or European American were invited to participate in the study.

During recruitment, 168 students filled out the BFI and reported demographics. Of those students, 127 self-identified as either Asian American or European American and were invited to participate. Of those invited, 44 students (22 Asian Americans and 22 European Americans) responded to the invitation and participated in the full study.

Participants individually visited the Claremont Behavioral Health Laboratory and signed a second informed consent form. After obtaining consent, the researcher placed an arm and a finger cuff on the participant to measure CV activity, which was measured continuously throughout the study. The participant filled out the STAI and PANAS while baseline CV measures were collected. After five minutes of gathering baseline activity, the arithmetic stress task was introduced. After completing the arithmetic stress task, the speech stress task was introduced. Once the speech task was completed, the participant was asked to relax while CV activity was monitored for another five minutes. After the stress tasks, participants completed the STAI and PANAS again. Participants then filled out the Individualism and Collectivism Measure, AAVS-M, AAMAS, SCQ-R, and Brief COPE. After the participant completed the session, he or she was given extra credit if in an Introductory Psychology course and given the opportunity to enter a raffle to win one of ten $25 gift cards and then debriefed.

Results

A multivariate analysis of variance (MANOVA) was conducted to examine how Asian Americans and European Americans differ in CV reactivity in response to stressful stimuli. CV reactivity was measured by SBP, DBP, HR change. As predicted, there was a non-significant trend showing that Asian Americans had less SBP reactivity than European Americans to the arithmetic stress task, $F(10, 30) = 1.65$, $p = .140$. Means and standard error are reported in Table 1.

A MANOVA was conducted to examine how Asian Americans and European Americans differ in level of extraversion, collectivism, and individualism. European Americans and Asian Americans scored the same in individualism and there was a non-significant trend for Asian Americans to score lower in extraversion and higher in collectivism than European Americans, $F(3, 40) = 2.17$, $p = .107$. European Americans reported higher levels of extraversion than Asian Americans, $t(42) = -2.18$, $p = .035$. Means and standard error are reported in Table 2. Mean SBP reactivity to the arithmetic stress task for individuals low and high in extraversion by ethnicity is reported in *Figure 1*.

Linear regression analyses were run to examine how extraversion relates to collectivism. There was a significant interaction between level of extraversion and collectivism on SBP reactivity to the arithmetic stress task, $R^2 \Delta = .094$, $F(1, 40) = 4.26$, $p = .046$. Low level of extraversion and high collectivism predicted low SBP reactivity ($\beta = 2.158$, $p = .046$). There was a non-significant trend toward increased SBP reactivity with participants high in extraversion and high in collectivism. The pattern of means suggests that the participants high in extraversion and high in collectivism had the highest rates of SBP reactivity. B and standard error are reported in Table 3.

Linear regression analyses were run to examine how extraversion relates to adherence to Asian American values. There was a significant interaction between level of extraversion and AAVS-M on SBP reactivity to the arithmetic stress task, $R^2 \Delta = .143$, $F(1, 39) = 6.84$, $p = .013$. Low level of extraversion and high AAVS-M predicted low SBP reactivity. High level of extraversion and high AAVS-M predicted increased SBP reactivity ($\beta = 2.329$, $p = .013$). B and standard error are reported in Table 4. The relationship between SBP reactivity to the arithmetic

stress task and AAVS-M score for individuals low and high in extraversion is reported in *Figure 2*.

Using the STAI, participants low in extraversion (M = .43, SE = .10) self-reported a greater increase in experienced stress after the stress tasks in comparison to those high in extraversion (M = .13, SE = .10). These results suggest that, in addition to physiological reactivity differences, there are differences in the expressed experience of anxiety between individuals low in extraversion and individuals high in extraversion.

A 2 x 2 within-subjects analysis of variance (ANOVA) was conducted to examine the interaction between ethnicity and type of stress task (arithmetic and speech) on CV reactivity. There was no significant interaction, $F(1, 42) = 1.34$, $p = .253$. These results suggest that stereotype threat was not a confounding factor for Asian Americans.

Discussion

This research aimed to extend upon the work of Hinton and Craske (1977). Hinton and Craske (1977) illustrated a relationship between level of extraversion and CV reactivity to stressful stimuli. The current study assessed whether level of acculturation moderated that relationship. The results of this study only partially supported the findings of Hinton and Craske (1977), suggesting that their findings may be out of date and need to be researched further to investigate other factors that may moderate the relationship between level of extraversion and CV reactivity. Overall, in agreement with the findings of Hinton and Craske (1977), low levels of extraversion were associated with greater CV reactivity, however this trend was not seen for less extraverted individuals who adhered to Asian American values. It was hypothesized that level of acculturation would moderate the effect of extraversion on CV reactivity in Asian Americans. In support of this hypothesis, the results of the current study illustrate that being

connected to Asian American culture has protective value for less extraverted individuals, as adherence to Asian American values predicted less CV reactivity to stress. This finding was not seen for European Americans connected to European culture. Asian American values were assessed by the AAVS-M and the collectivism measure. Collectivism is the tendency to place group needs and goals above the objectives and desires of the individual (Hofstede, 1980) and is one of the five subscales of the AAVS-M (Kim et al., 2005). These results suggest that low levels of extraversion benefit individuals who are highly collectivistic and adhere to Asian American values by being associated with less CV reactivity, whereas high levels of extraversion do not benefit individuals who are highly collectivistic or adhere to Asian American values. Extraversion may not be compatible with collectivistic values of interdependence and group integrity and harmony since extraverts like to act autonomously, emphasizing pleasure and the pursuit of happiness to maintain the self (Brebner & Cooper, 1978; Costa & McCrae, 1985). The societal implications of these findings may be that individuals low in extraversion who adhere to Asian American values have developed a compatibility of personality type and sense of self with regard to culture that reduces physiological reactivity to stress. Future research should expand on the external validity of these findings and investigate this research question in a community sample.

Collectivism is a cultural theme common to many East Asian, Southeast Asian, South Asian, and Pacific Island cultures (Hofstede, 1980; Markus & Kitayama, 1991), but there is much cultural diversity within the broad Asian American ethnic category. This study's Asian American sample included mostly East Asian participants, but also a few Southeast Asian participants. Some participants' values may differ depending on country and culture of origin so future research should examine specific ethnic differences between Asian ethnicities to

investigate the diversity and intragroup variance. Although collectivism is a common value in most Asians cultures, other Asian values may be emphasized to differing degrees depending on the individual culture.

The results illustrated that Asian Americans scored higher in collectivism, but equal in individualism in comparison to European Americans. This finding suggests that from this sample, Asian Americans and European Americans adhered to individualistic values equally. This may be the result of acculturation to American values and the adoption of a bicultural identity. Americans celebrate individualism as an integral part of their culture, valuing personal privacy and individual rights and freedoms (Oyserman et al., 2002). The Asian Americans in this sample may be acculturating to American culture while continuing to hold on to some of their Asian cultural values. Additionally, Asian cultures do tend to value independence, but it may be more reflective of the value of self-reliance and the goal of not burdening others as opposed to the American independence ideal. These findings illustrate the concept of allocentrism, having an interdependent self-construal but living in an individualistic society (Markus & Kitayama, 1991). These results provide support for the argument against linear models of acculturation and collectivism/individualism. Acculturation may not exist on a continuum. Asian Americans from this sample typify the orthogonal model; individuals are not either collectivistic or individualistic, but can maintain a dual identity encompassing both characteristics (Dao, Teten, & Nguyen, 2011; Oyserman et al., 2002).

This study adds to the limited research on Asian Americans. More research on CV reactivity in Asians and Asian Americans may shed light on why Asian Americans show lower cardiovascular disease (CVD) mortality rates than African Americans, European Americans, and

Latin@s (Centers for Disease Control and Prevention, 2001). CV reactivity research could add to the incomplete literature on the health and disease profile of Asian Americans.

Individuals low in extraversion self-reported a greater increase in state anxiety after the stress tasks in comparison to those high in extraversion. These findings suggest that, unless they adhered to Asian American values, those low in extraversion displayed greater physiological reactivity in response to stressful stimuli and concordantly felt as if they experienced greater state anxiety than those high in extraversion. Previous research has found that social anxiety is associated with low levels of extraversion and deficits of positive emotionality (Bienvenu et al., 2004; Naragon-Gainey, Watson, & Markon, 2009). Further research should investigate if low levels of extraversion are related to greater feelings of state anxiety in response to stress and if that relationship is associated with the link between extraversion and social anxiety and depression (Bienvenu et al., 2004).

I acknowledge the limitations of the current study. Firstly, the small sample size limited the validity of the results. Some of the non-significant trends illustrated by the data may be significant with a larger sample size. The students in the sample were primarily of higher socioeconomic status than what is representative of the general population. The sample was restricted to college students at a liberal arts institution. Further research should address these limitations to increase the external validity of these findings. Additionally, task interpretations and individual differences may jointly affect CV reactivity in response to stressful stimuli. To address this issue, this study utilized two distinct stress tasks in order to investigate whether or not one stress task was more personally or culturally relevant and elicited greater responses for a particular demographic. Regardless of ethnicity, individuals had greater CV reactivity to the arithmetic stress task than to the speech stress task. This finding illustrated that stereotype threat

regarding Asians as the model minority or skilled at arithmetic was not a factor. There was no significant interaction between the stress tasks; Asian Americans did not react differently to the arithmetic stress task compared to European Americans. Other task interpretations and individual differences that affect CV reactivity may exist and should be addressed in further research. Some differences that may affect CV reactivity could be the participants' perception of stress task difficulty (LaGory, Dearen, Tebo, & Wright, 2011), perception of self-efficacy (Gerin, Litt, Deich, & Pickering, 1995), differences in social support networks (Uchino, Holt-Lunstad, Uno, & Flinders, 2001), and experience of social anxiety (Gramer & Saria, 2007).

To the best of my knowledge, this was the first study to assess how level of acculturation effects level of extraversion and CV reactivity in Asian Americans. I believe that these findings expand upon the existing literature on extraversion, stress reactivity, and cultural and ethnic differences. Future research should investigate similar research questions in underrepresented and community populations, examine different mechanisms of stress, and research other factors that may influence CV reactivity to stress.

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Table 1

Means, Standard Error, and 95% Confidence Intervals for CV Reactivity by Ethnicity

	Asian American			European American		
CV Reactivity	*M*	*SE*	95% CI	*M*	*SE*	95% CI
SBP arithmetic reactB*	3.60	1.97	[-.38, 7.58]	8.52	1.97	[4.54, 12.50]
SBP speech reactB*	1.81	2.41	[-3.07, 6.69]	3.61	2.41	[-1.27, 8.49]
DBP arithmetic reactB*	2.16	1.23	[-.32, 4.65]	2.03	1.23	[-.46, 4.51]
DBP speech reactB*	.30	1.34	[-2.41, 2.99]	.82	1.34	[-1.89, 3.52]
HR arithmetic reactB*	3.74	1.13	[1.46, 6.01]	5.22	1.13	[2.94, 7.49]
HR speech reactB*	2.99	1.41	[.14, 5.83]	3.98	1.41	[1.13, 6.83]
SBP arithmetic reactR**	6.81	1.80	[3.17, 10.45]	12.31	1.80	[8.67, 15.96]
SBP speech reactR**	5.03	1.94	[1.10, 8.95]	7.41	1.94	[3.48, 11.34]
DBP arithmetic reactR**	7.91	1.21	[5.47, 10.35]	5.20	1.21	[2.76, 7.63]
DBP speech reactR**	6.04	1.01	[4.01, 8.08]	3.98	1.01	[1.95, 6.02]
HR arithmetic reactR**	4.95	1.22	[2.48, 7.43]	8.61	1.22	[6.14, 11.09]
HR speech reactR**	4.20	1.39	[1.39, 7.02]	7.37	1.39	[4.56, 10.19]

Note. SBP = Systolic blood pressure; DBP = Diastolic blood pressure; HR = Heart rate.

* Indicates CV reactivity from pre-stress task baseline measures
** Indicates CV reactivity from post-stress task recovery measures

Table 2

Means, Standard Error, and 95% Confidence Intervals for Measures by Ethnicity

	Asian American			European American		
Measure	*M*	*SE*	95% CI	*M*	*SE*	95% CI
Extraversion	2.51	.19	[2.12, 2.89]	3.10	.19	[2.71, 3.48]
Collectivism	6.45	.23	[5.98, 6.92]	6.17	.23	[5.70, 6.64]
Individualism	6.06	.20	[5.66, 6.46]	5.88	.20	[5.48, 6.28]

Table 3

B and Standard Error for SBP Reactivity and Collectivism by Level of Extraversion

			Unstandardized Coefficients	
Level of extraversion	Model		B	Std. Error
Low extraversion	1	(Constant)	4.948	18.638
		Systolic baseline	.031	.181
	2	(Constant)	46.223	22.678
		Systolic baseline	.016	.159
		Collectivism	-5.887	2.238
High extraversion	1	(Constant)	13.301	10.516
		Systolic baseline	-.079	.091
	2	(Constant)	4.392	12.648
		Systolic baseline	-.094	.090
		Collectivism	1.800	1.460

Table 4

B and Standard Error for SBP Reactivity and AAVS-M by Level of Extraversion

			Unstandardized Coefficients	
Level of extraversion	Model		B	Std. Error
Low extraversion	1	(Constant)	57.968	22.069
		Systolic baseline	-.048	.150
		AAVS-M	-10.884	3.281
High extraversion	1	(Constant)	-9.254	12.649
		Systolic baseline	-.087	.080
		AAVS-M	6.334	2.422

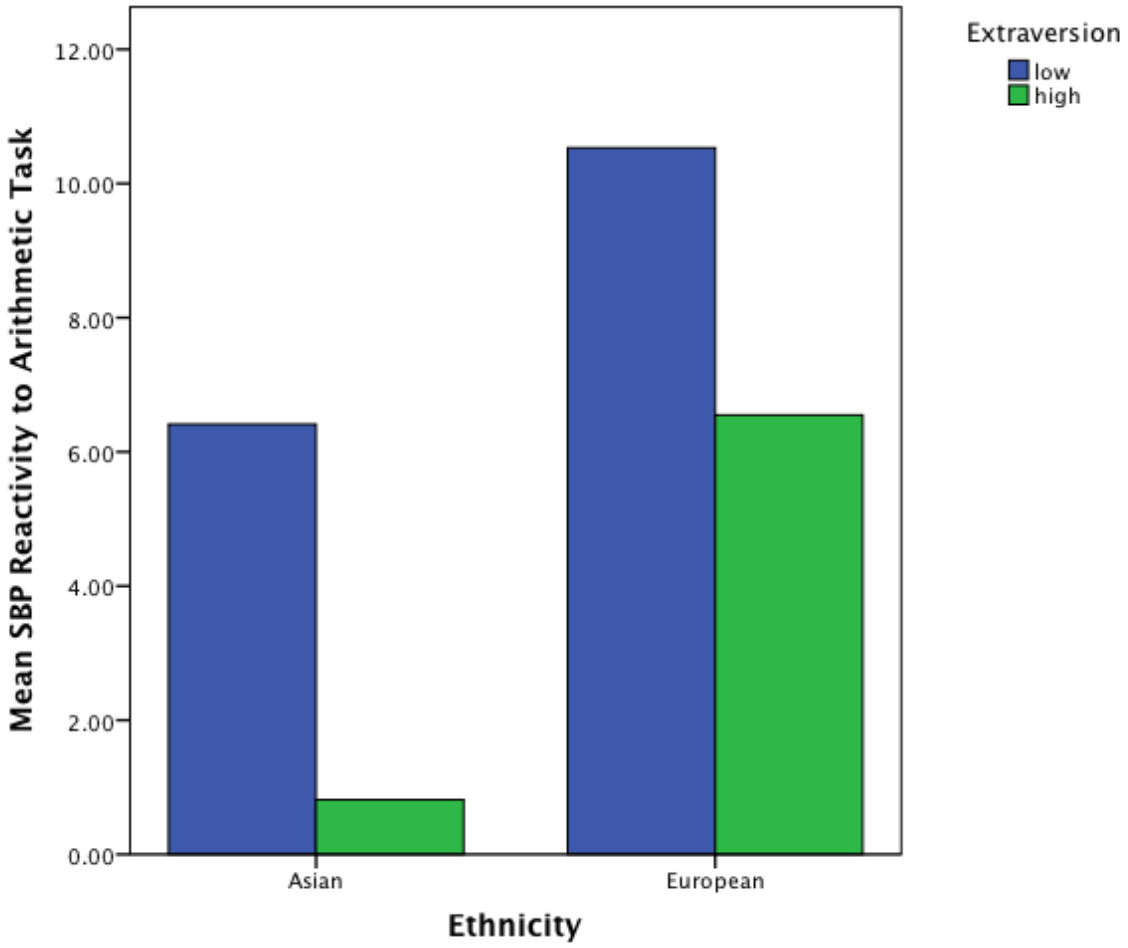

Figure 1. Mean SBP reactivity to the arithmetic stress task for individuals low and high in extraversion by ethnicity.

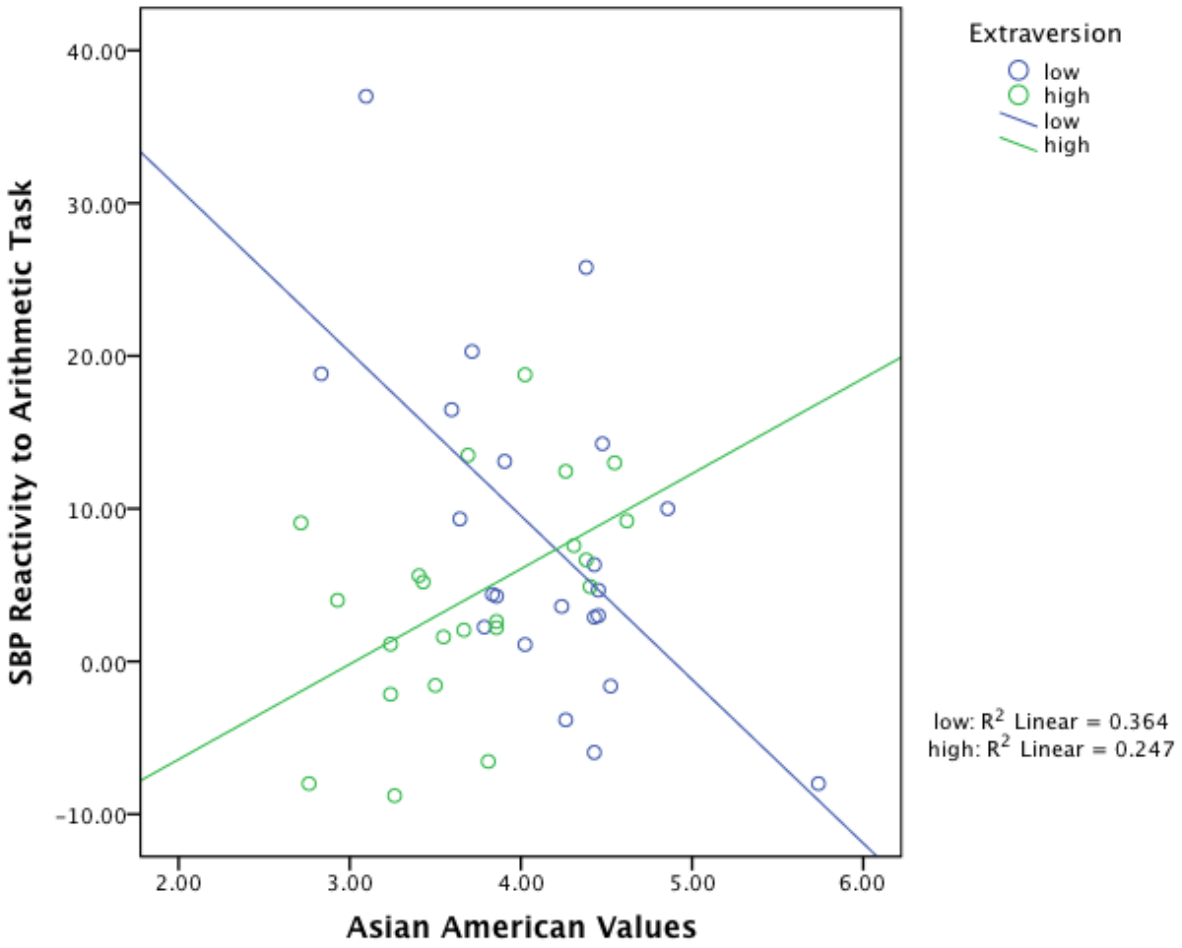

Figure 2. Relationship between SBP reactivity to the arithmetic stress task and AAVS-M score for individuals low and high in extraversion.