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Depression in Asian Americans: Does Generational Status and Acculturation Predict Severity and Type of Symptoms?

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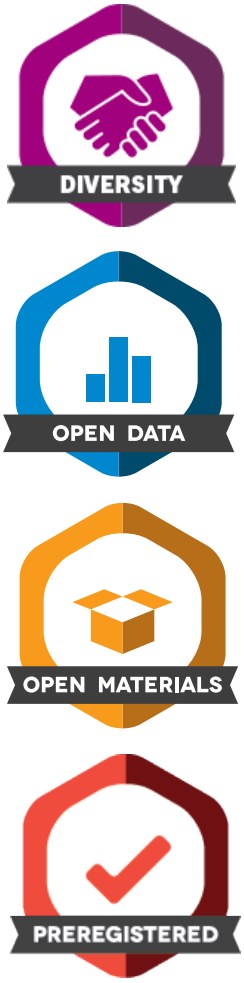
ABSTRACT. Despite being one of the most prevalent mental disorders, accurate identification and treatment of depression may be hindered by the diversity of symptom presentation across, and even within, cultures. This study sought to identify how severity and type of depressive symptoms (psychological vs. somatic) vary by acculturation and generational status among Asian Americans. A sample of 82 U.S.-born and 81 first-generation participants completed an online anonymous survey (Patient Health Questionnaire, Somatic Symptoms Scale, Vancouver Index of Acculturation). U.S.-born participants reported higher depression symptom severity than first-generation participants (U = 2,386, p = .002, η2 = .06), which aligned with the hypotheses. Inconsistent with our hypotheses, somatic symptoms of depression did not differ between U.S.-born and first-generation Asian Americans (U = 2,835, p = .11, η^2 = .02). Symptom severity had a weak negative correlation with acculturation to mainstream culture, $r(145) = -.23$, p = .006, and no correlation with heritage culture orientation, $r(145) = -.16$, p = .06, which also did not support our predictions. Consistent with previous research, depression severity was higher in U.S.-born Asian Americans, but this difference did not appear related to acculturation. Future research should seek to understand what aspects of generational status are tied to depression severity. Although previous theorizing suggested that Asians express depression more somatically, these findings add confidence to the small body of literature that suggests this is not the case. These findings may help improve the accuracy of diagnosis, leading to improved treatment of depression for patients of Asian heritage.

Keywords: Asian American, depression, somatic symptoms, acculturation, generational status

BẢN TÓM TẮT. Mặc dù trầm cảm là một trong những chứng rối loạn tâm lý phổ biến nhất, việc xác định và điều trị chứng bệnh này vẫn gặp phải khó khăn do sự đa dạng của biểu hiện của triệu chứng tuỳ theo từng nền văn hoá khác nhau, và thậm chí biểu hiển khác nhau mặc dù trong cùng một nền văn hoá. Bài nghiên cứu này muốn xác định mức độ nghiêm trọng và loại triệu chứng



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của trầm cảm (tâm lý hoặc thể chất) khác nhau như thế nào khi so sánh dựa theo mức độ hoà nhập văn hoá và thế hệ di dân của cộng đồng người Mỹ gốc Á. Một nhóm mẫu gồm 82 người gốc Á sinh ra tại Hoa Kỳ và 81 người gốc Á di dân đến Hoa Kỳ đã hoàn thành một khảo sát ẩn danh trực tuyến (Patient Health Questionnaire, Somatic Symptoms Scale, Vancouver Index of Acculturation). Nhóm người sinh ra tại Hoa Kỳ báo cáo mức độ nghiêm trọng của triệu chứng trầm cảm cao hơn so với nhóm người thế hệ di dân đầu tiên ($U = 2386$, $p = .002$, $\eta^2 = .059$), đúng như dự đoán của giả thuyết. Trái với dự đoán của chúng tôi, mức độ nghiêm trọng của triệu chứng về thể chất giữa nhóm sinh ra tại Hoa Kỳ và nhóm di dân thế hệ đầu không có sự khác biệt ($U = 2835$, $p = .11$, $\eta^2 = .016$). Mức độ nghiêm trọng của triệu chứng trầm cảm có mối tương quan tiêu cực yếu với mức độ hoà nhập văn hoá Hoa Kỳ, $r(145) = -.23$, $p = .006$, và không có mối tương quan với mức độ hoà nhập văn hoá gốc, $r(145) = -.16$, $p = .06$, không như dự đoán của giả thuyết. Đúng theo như kết quả của những nghiên cứu trước đây, mức độ nghiêm trọng của trầm cảm cao hơn ở người gốc Á sinh ra tại Hoa Kỳ, nhưng sự khác biệt này không có sự liên qua đến mức độ hoà nhập văn hoá. Các nghiên cứu tiếp theo trong tương lai nên tìm hiểu xem khía cạnh nào của thế hệ di dân có liên quan đến mức độ nghiêm trọng của triệu chứng trầm cảm. Mặc dù các giả thuyết trước đây cho rằng người châu Á thường biểu hiện trầm cảm qua các triệu chứng thiên về thể chất, kết quả trong bài nghiên cứu này củng cố cho một phần nhỏ các nghiên cứu cho rằng điều này không đúng. Những kết quả từ bài nghiên cứu này có thể giúp nâng cao sự chính xác của việc chẩn đoán, dẫn đến nâng cao phương pháp điều trị trầm cảm cho bệnh nhân gốc Á.

Từ khoá: Người Mỹ gốc Á, trầm cảm, triệu chứng về thể chất, mức độ hoà nhập văn hoá, thế hệ di dân

Depression has often been referred to as the "common cold" of mental disorders for its high global prevalence (Goodwin, 2006). Nearly 280 million people worldwide suffer from this disorder, leading to an estimated 700,000 cases of suicide annually (World Health Organization, n.d.). Depression was reported to be the mental disorder with the second-highest annual prevalence in the United States, only surpassed by anxiety disorders (National Alliance on Mental Illness, n.d.). Despite being one of the most prevalent mental disorders, depression still puzzles many researchers due to its complexity. The symptoms and severity of depression are not universal, despite being a global problem. The differences among and even within various ethnicities/cultures regarding the prevalence and severity of depression remain an ongoing question for researchers.

First-generation immigrants who are born in one country and later migrate to another country make up 13.6% of the U.S. population (United States Census Bureau, 2021). Previous studies have compared the prevalence of depression between immigrant populations and Western-born populations using culturally diverse samples; however, these studies have produced conflicting results. Although some researchers found that immigrants displayed lower severity and prevalence of mood disorders than Western-born individuals (e.g., Breslau et al., 2007; Salas-Wright et al., 2014), others found that immigrants were more likely to have mood disorders than Western-born individuals (e.g., Missinne & Bracke, 2012). Greater clarity could likely be obtained by focusing on specific immigrant populations rather than immigrants as a monolith.

However, mixed findings have also been reported in studies of depression in the Asian population in the United States, specifically. Approximately 24 million people in the United States identify themselves as Asian or partial-Asian (United States Census Bureau, 2020). This study sought to further our understanding of depression in Asian Americans by teasing apart how severity and type of depressive symptoms relate to generational status and acculturation.

Depression Severity by Generational Status

U.S.-born Asian Americans have been thought to have higher rates of depression than first-generation Asian Americans, and several reasons have been proposed for this difference. One hypothesized reason is that

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U.S.-born children of first-generation immigrants may be more likely to experience conflicts with their cultural identities. These individuals might lack a sense of belonging as they might feel "not Asian enough" and at the same time "not American enough" (Kim et al., 2006). These long-term stressors may eventually create a chronic state of emotional distress that may relate to increased symptoms of depression in U.S.-born Asians.

In addition, growing up in a Western country, children of first-generation Asian immigrants are more likely to adopt Western values and norms while still living under the rules of their parents who believe in traditional Asian norms (Kim et al., 2006). Being expected to behave according to their parents' traditional values, which include obeying elders, might lead to a state of frustration among U.S.-born children of Asian immigrants. Differences in the expression of love between the two cultures perhaps can also create emotional barriers between Asian immigrant parents and their U.S.-born children. Asian parents are less likely to verbally express their love or display intimate physical gestures (i.e., hugging, kissing) towards their children, which contrasts with the mainstream U.S. culture's way of showing love (Clayton, 2014). Asian parents are more likely to show their love through acts of service, such as providing food, financial support, or access to better education, etc. (Clayton, 2014). The emotional intimacy behind these actions may not be understood by the U.S.-born children, who may be less able to recognize the demonstrations of love from their immigrant parents or feel a lack of emotional connection.

Additionally, compared to Western-born individuals, first-generation Asian immigrants tend to hold more stigma against mental illnesses (Livingston et al., 2018). This stigma might prevent first-generation immigrant parents from showing support to their children who struggle with emotional and mental problems. Consistent with this idea, Asian American college students reported that they do not receive enough emotional support from their parents and constantly worry about not being able to live up to their parents' expectations (Greenberger & Chen, 1996). This perceived lack of empathy and family support may thus contribute to the higher severity of depressive symptoms in U.S.-born Asians compared to first-generation Asian immigrants.

However, although some research has found that the lifetime prevalence of major depression in Asians born in the host country is higher than in first-generation Asian immigrants (Breslau & Chang, 2006), other studies have failed to replicate these findings. For instance, one study of South Asian Canadians did not find a difference in the prevalence rates of mood disorders between their first-generation and their Canadian-born subsamples (Islam et al., 2014). Additionally, Takeuchi et al. (2007) only found a higher risk of depressive disorder for U.S.-born Asians than first-generation Asians among female participants. These mixed results indicated that it is still unclear whether being born in the host country constitutes a risk factor for depressive disorder for Asian individuals.

Acculturation and Depression

Acculturation refers to how an immigrant adapts to a new host culture that is different from their origin (Heine, 2020). If generational status relates to depression, acculturation might also be expected to relate to depression. In fact, acculturation might be assumed to be the mechanism by which generational status relates to depression: Given that White U.S. Americans have three times higher rates of depression compared to Asian Americans (Lee et al., 2023), those most influenced by U.S. mainstream culture might accordingly have higher rates of depression. Many researchers have investigated the relationship between acculturation and mental illness. However, again, the findings have been mixed. Although some researchers found that among Asian international students, greater acculturation was associated with better mental health (Meghani & Harvey, 2016; Wang & Mallinckrodt, 2006), others found that higher acculturation level had a negative association with mental well-being among Vietnamese American college students (Nguyen & Peterson, 1993). Meanwhile, Shen and Takeuchi (2001) showed that acculturation did not have any relationship with mental health among employed Chinese Americans.

Shen and Takeuchi (2001) pointed out that perhaps these mixed results were due to differences in the way that each researcher operationalized "acculturation." For example, Rahman and Rollock (2004) measured acculturation based on factors of perceived prejudice, social customs, and language usage. Nguyen and Peterson (1993) considered the factor of cultural identity and sense of belonging. A common factor that many researchers have often used to measure acculturation is language (e.g., language preference, host language proficiency; Jang et al., 2005).

Perhaps the mixed results from previous studies stemmed from the use of the unidimensional models of acculturation. Individuals do not necessarily identify themselves strictly with one culture and diminish the other; they may have multiple cultural identities that exist independently of each other (Ryder et al., 2000). Given this, several researchers have suggested that a unidimensional measurement of acculturation is inappropriate, recommending instead the use of a bidimensional model that measures individuals' multiple cultural identities independently (Meghani & Harvey,

2016; Wang & Mallinckrodt, 2006). For instance, Berry (1990) theorized four categories of acculturation strategies based on how much individuals value maintaining their heritage culture's identity and characteristics and how much they value developing and maintaining relationships with the larger society. Measuring acculturation using a bidirectional model may help clarify the previous mixed findings regarding acculturation and depression. The current study measured acculturation using a bidimensional model developed by Ryder et al. (2000), in which the orientation toward host culture and the orientation toward heritage culture are evaluated independently.

Psychological and Somatic Symptoms of Depression

Most studies on depression have assessed participants using scales that focus on psychological symptoms of depression. Although many patients with depression display psychological symptoms, others may have symptoms that are more physically related, called somatic symptoms (Heine, 2020). As Asians are more likely to hold stigmas and negative attitudes toward mental illness than individuals of other races (Eisenberg et al., 2009), there is a possibility that these stigmas may drive Asian individuals to suppress or hide their emotional distress when being evaluated, resulting in fewer reports of psychological symptoms and more reports of somatic symptoms (Anderson & Mayes, 2010). Researchers may inaccurately conclude that their Asian samples have low rates of depression if they exclusively focus on psychological symptoms of depression, to the exclusion of somatic symptoms (Anderson & Mayes, 2010).

Several studies have found greater somatic symptomatology among Asian individuals who are diagnosed with depression. One study observed inpatients diagnosed with depression from 40 psychiatric facilities in six East Asian countries and found that these patients all suffered from pain-related physical symptoms (Novick et al., 2013). Parker et al. (2001) found that patients in Malaysia displayed fewer cognitive symptoms of depression (e.g., feeling worthless or guilty), but significantly more somatic symptoms compared to White patients in Australia. Similar results were also reported in a comparison of patients in China and White patients in Canada (Ryder et al., 2008). This phenomenon was not only prevalent among individuals in Asia but has also been observed in Asian individuals from Western countries. Consistent with the results from Asia, Westerners of Asian heritage have also been found to display more somatic symptoms of depression compared to individuals of other races and ethnicities (Chang et al., 2017; Huynh, 2012).

However, several studies have produced contradictory findings. Kalibatseva et al. (2014) found that Chinese Americans did not show significantly more somatic symptoms than White Americans. In fact, a similarly designed study found that Chinese Americans have fewer somatic symptoms compared to their White counterparts (Kalibatseva & Leong, 2018). Differences in the prevalence of somatic symptoms by generational status have also previously been examined, again with mixed findings. Although U.S.-born Chinese Americans reported more somatic symptoms compared to their foreign-born counterparts (Zhu, 2018), the same effect did not hold for U.S.-born Filipinos compared to first-generation Filipino immigrants (Mossakowski, 2007). These mixed results imply that it is still unclear whether somatic symptoms are more prevalent in Asian individuals compared to individuals of other ethnicities, and whether somatic symptoms differ by generational status among Asian Americans.

Current Study

In sum, previous findings regarding the severity and nature of depressive symptoms in U.S.-born and first-generation Asian Americans have been mixed. Whether acculturation is related to the severity of depression symptoms is also still unclear. Improving our understanding of how depression may present differently in U.S.-born and first-generation Asian Americans is important for mental health professionals to more accurately diagnose and treat these populations. To this end, this study sought to examine four hypotheses: U.S.-born Asian Americans report greater severity of general depressive symptoms than first-generation Asian Americans (H1); first-generation participants report more somatic symptoms than U.S.-born participants (H2); those more highly acculturated to mainstream American culture report more general depressive symptoms (H3); those more orientated toward their heritage culture report less general depressive symptoms (H4).

The fourth hypothesis was not part of the study's original preregistration (https://aspredicted.org/SR6_Q1T). It was added to be more consistent with the Vancouver Index of Acculturation (VIA) scale, which emphasizes a bidimensional model of acculturation, measuring orientation toward heritage culture and orientation toward host culture independently. The data were collected but had yet to be analyzed at the time of this change.

Method

Participants

Participants in the study were Asian individuals living in the United States. Most participants were recruited

through online recruitment and snowball sampling (n = 190). Other participants (n = 27) were college students in Northern California who completed the survey through the university research website for course credit. In total, 217 participants started the survey. Ten participants did not meet the inclusion criteria: three participants did not report living in the United States, and seven participants did not self-identify as Asian. A total of 44 participants were excluded for the following reasons: 16 participants opened the survey but did not provide any data, 22 participants began the survey but did not provide sufficient data to be included in any analyses, and 6 responses were excluded due to multiple participations and/or nonsensical responses. The removal of these participants from the data set resulted in a final sample size of 163 participants, which based on the a priori power analysis described below, was more than sufficient to test the study hypotheses. Among these individuals, several only provided partial data but could still be included to test certain hypotheses.

Participants' ages ranged from 14 to 59. Eighteen participants did not report their age. Almost two-thirds of the sample were women, just under one-third were men, and 4% identified as nonbinary or other. Table 1 displays the characteristics of the total sample and generational status subsamples.

Measures

Predictor Variables

Generational Status. The participants were asked to answer "yes" or "no" to the question "Were you born in the US?" Participants answering "yes" were categorized as "U.S.-born." Participants answering "no" were categorized as "First Generation."

Acculturation. The Vancouver Index of Acculturation (VIA; Ryder et al., 2000) is a 20-item instrument in which participants are asked to rate their degree of agreement to scale items from 1 (*disagree*) to 9 (*agree*). The scale includes two subscales: 10 items assess participants' connection to their heritage culture (e.g., "I believe in the values of my heritage culture," "I am interested in having friends from my heritage culture") and 10 items assess their connection to mainstream American culture (e.g., "I believe in mainstream American values," "I am interested in having white American friends"). Items were averaged within each subscale with higher scores reflecting a higher orientation to that culture. Cronbach's alphas for the Heritage subscale and Mainstream subscale in the current sample were .87 and .85, respectively.

Outcome Variables

General Symptoms of Depression. The Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) is one of the most commonly used screening tools for depression (Beard et al., 2016). It asks participants to rate how often they have been bothered by symptoms of depression during the past two weeks. The scale includes five psychological/cognitive symptoms (assessing lack of interest, depressed mood, negative feelings about self, concentration problems and suicidal ideation) and four somatic symptoms (assessing problems with sleep, feeling tired/low energy, excessive or diminished appetite, and psychomotor agitation/retardation; Smolderen et al., 2009). Participants were asked to rate the nine symptoms on a scale from 0 to 3 (0 = *not at all*, 1 = *several days*, 2 = *more than half the days*, 3 = *nearly every day*). Cronbach's alpha in the current sample was .90.

Somatic Symptoms. The Somatic Symptoms Scale (SSS-8; Gierk et al., 2014) asks participants to describe how much they have been bothered by eight physical symptoms (e.g., "feeling tired or having low energy," "pain in your arms, legs, or joints") on a Likert-type scale ranging from 0 to 4 (0 = *not at all*, 1 = *a little bit*, 2 = *somewhat*, 3 = *quite a bit*, 4 = *very much*) during the past 7 days. Cronbach's alpha in the current sample was .83.

Procedure

The study was approved by the institutional review board at California State University at Sacramento

TABLE 1

Sample Characteristics of the Total Sample and by Generational Status

Variable	Total n = 163		First-gen n = 81		U.S.-born n = 82	
Age, *M* (*SD*)	28.14	(10.14)	31.96*	(11.26)	24.59*	(7.45)
Gender						
Woman	108	(66.3%)	55	(67.9%)	53	(64.6%)
Man	49	(30.1%)	24	(29.6%)	25	(30.5%)
Nonbinary/Other	6	(3.7%)	2	2 (2.5%)	4	(4.9%)
Asian Subgroups						
Southeast Asian	122	(74.8%)	74*	(91.4%)	48*	(58.5%)
East Asian	9	(5.5%)	1*	(1.2%)	8*	(9.8%)
South Asian	9	(5.5%)	2	(2.5%)	7	(8.5%)
Pacific Islander	3	(1.8%)	0	(0%)	3	(3.7%)
Multi-ethnic	20	(12.3%)	4*	(4.9%)	16*	(19.5%
Acculturation, *M* (*SD*)						
U.S. Culture	6.18	(1.42)	6.06	(1.37)	6.28	(1.47)
Heritage Culture	6.60	(1.52)	7.08*	(1.53)	6.14*	(1.36)

Note. *$p < .001$. Differences in sample characteristics between U.S.-born and first-generation subsamples were tested via t tests (age & acculturation) and chi-square (Asian subgroups & gender).

and was preregistered prior to data collection (https://aspredicted.org/SR6_Q1T). A research invitation with the link to a Qualtrics survey was sent to multiple internet platforms such as Facebook, Reddit, Discord, etc. The keyword "Asian" and other related keywords such as "Vietnamese," "Chinese," "Filipino," "Hmong," etc., were used to seek online forums whose members might meet the criteria for the target sample of the study. A copy of the questions from the survey can be found at https://osf.io/9j542. A Vietnamese translation of the invitation was also included when the invitation was posted on Vietnamese-dominated online forums (however, the survey was only available in English). The study was also available on the psychology department research participant pool website. To recruit students who met the inclusion criteria of self-identifying as Asian, the university research website utilized screening questions, and only students who identified as Asian were able to see and access this study. All participants accessed and completed the anonymous online survey through Qualtrics. To confirm that participants self-identified as Asian, the first question on the survey asked participants to identify their racial/ethnic heritage, and those who did not select the option "Asian" were exited from the survey. Students who completed the survey through the university research website received research participation credit for their courses. Participants recruited online did not receive incentives.

Data Analysis

An a priori power analysis was performed using the statistical power calculator G*Power 3.1. A sample size of at least 51 for each of the two groups was deemed necessary for the proposed *t* tests to detect a medium effect with a power level of 80% and a significance level of .05. Additionally, a sample size of at least 67 was deemed necessary for detecting a correlation coefficient of ± .30, with a power level of 80% and a significance level of .05. Thus, a minimum sample size of 102 was planned, with at least 51 U.S.-born and 51 foreign-born Asians.

SPSS 27 was used to organize the data and analyze the results. The data can be found here. To test the first and second hypotheses, Mann-Whitney *U*-tests were used to compare the differences in general depressive symptoms (PHQ-9) and in somatic symptoms (SSS-8) between the first-generation subsample and the U.S.-born subsample. Spearman correlations between acculturation (VIA) and severity of general depressive symptoms (PHQ-9) were examined to test the third and fourth hypotheses. The *p* values were adjusted for multiple testing using the Benjamini-Hochberg false discovery rate method (Benjamini & Hochberg, 1995). The new threshold value after adjustment was .006.

Results

Kolmogorov-Smirnov tests of normality were conducted to determine whether data for general depressive symptoms, somatic symptoms, and acculturation were normally distributed. The results indicated that data for general depressive symptoms ($p < .001$), somatic symptoms ($p < .001$), and heritage culture orientation ($p = .03$) were not normally distributed. In contrast, the data for American culture acculturation were normally distributed ($p = .20$). However, the skewness of the nonnormally distributed data was at a moderate level (.61, .65, and –.51, respectively). As assessed by Levene's test for equality of variances, there was homogeneity of variances for all the variables: general depressive symptom severity ($p = .14$), somatic symptoms ($p = .06$), heritage culture orientation ($p = .39$), and American culture acculturation ($p = .21$). One outlier was detected. It was not extreme and did not significantly impact the results; thus, it was not removed. These results led to the decision to use nonparametric tests (i.e., Mann-Whitney U-test and Spearman's rank correlation) to analyze the data.

First-generation participants ($M = 31.96$, $SD = 11.26$) were significantly older in age than U.S.-born participants ($M = 24.59$, $SD = 7.45$) $t(143) = 4.68$, $p < .001$. There was no significant difference regarding gender between the two subsamples, $\chi^2(3, N = 163) = 3.39$, $p = .34$. The whole sample was predominately Southeast Asian. However, although first-generation participants in this sample were more likely to be Southeast Asian (91.4%), U.S.-born individuals in this sample were more likely to identify as multiethnic (19.5%) or East Asian (9.8%), $\chi^2(4, N = 163) = 23.96$, $p < .001$. As expected, first-generation participants ($M = 7.08$, $SD = 1.53$) reported higher heritage orientation compared to U.S.-born participants ($M = 6.14$, $SD = 1.37$), $t(145) = 3.91$, $p < .001$. However, there was no significant difference in American orientation between the two subsamples, $t(145) = -0.93$, $p = .36$.

Hypotheses Testing

Table 2 includes descriptive statistics as well as correlations between study variables. A Mann-Whitney *U*-test was performed to test the first hypothesis, which predicted that the severity of general depressive symptoms in the U.S.-born subsample would be higher than in the first-generation subsample. The severity of general depressive symptoms in the U.S.-born subsample ($Mdn = 9$) was found to be higher than in the first-generation subsample ($Mdn = 7$; $U = 2{,}386$, $p = .002$, $\eta^2 = .06$). Thus, the first hypothesis was supported.

A Mann-Whitney *U*-test was also performed to test the second hypothesis, which predicted that first-generation participants would report more somatic

symptoms than U.S.-born participants. Although the results showed that the U.S.-born participants (*Mdn* = 9) reported more somatic symptoms compared to the first-generation participants (*Mdn* = 8), the difference was not statistically significant ($U = 2{,}835$, $p = .11$, $\eta^2 = .02$). Thus, the second hypothesis was not supported.

A Spearman's rank correlation coefficient was computed to test the third hypothesis, which predicted that acculturation to mainstream American culture would positively correlate with the severity of general depressive symptoms. There was a weak, but significant negative correlation between the acculturation to mainstream American culture and the severity of general depressive symptoms, $r(145) = -.23$, $p = .006$, 95% CI [−.38, −.07], which was in the opposite direction of our prediction. Thus, the third hypothesis was not supported.

Finally, a Spearman's rank correlation coefficient was computed to test the fourth hypothesis, which predicted that orientation toward heritage culture would have a negative correlation with the severity of general depressive symptoms. No correlation was found between the orientation toward heritage culture and the severity of general depressive symptoms, $r(145) = -.16$, $p = .06$, 95% CI [−.31, .01]. Thus, the fourth hypothesis was not supported.

Follow-Up Analyses

Because the PHQ-9 includes both psychological/cognitive symptoms and somatic symptoms of depression, it remains unclear whether psychological/cognitive symptoms differ by generational status or acculturation when we use the total score of the PHQ-9. We thought it would be worthwhile to test whether the same pattern of results held when examining only the psychological/cognitive symptoms from the PHQ-9. We therefore created two PHQ-9 subscales: one composed of only psychological/cognitive symptoms and one composed of only somatic symptoms, and repeated the analyses.

The results were identical when using the psychological/cognitive symptoms subscale of the PHQ-9 as when using the total score. For H1, U.S.-born participants (*Mdn* = 5) reported significantly higher scores on the psychological/cognitive symptom subscale of the PHQ-9 compared to the first-generation participants (*Mdn* = 3; $U = 2{,}477$, $p = .005$, $\eta^2 = .05$). For H2, U.S.-born participants (*Mdn* = 5) reported significantly higher scores on the somatic symptom subscale of the PHQ-9 compared to the first-generation participants (*Mdn* = 3; $U = 2{,}426$, $p = .003$, $\eta^2 = .05$). This result was similar to the analyses using the Somatic Symptoms Scale (SSS-8). However, it did not reach the level of significance. For H3 and H4, the PHQ-9 psychological/cognitive symptom subscale negatively correlated with acculturation to mainstream American culture, $r(145) = -.27$, $p = .001$, 95% CI [−.41, −.11], and was unrelated to orientation to heritage culture ($p = .10$, 95% CI [−.29, .03]). As an aside, neither mainstream culture acculturation ($p = .07$, 95% CI [−.30, .01]) nor heritage culture orientation ($p = .06$, 95% CI [−.31, .01]) was significantly correlated with the PHQ-9 somatic subscale. Because we did not hypothesize a relation between acculturation and somatic symptoms, we had not tested this relation using the SSS-8, and thus we do not compare these findings.

Discussion

The purpose of this study was to compare the severity and type of depression symptoms between first-generation and U.S.-born Asian Americans and to determine whether an association exists between symptom severity and acculturation level of these individuals. As predicted, first-generation Asian Americans reported lower severity of general depressive symptoms than U.S.-born Asians; however, reports of somatic symptoms did not differ between the two subsamples. Additionally, higher acculturation to the mainstream American culture was unexpectedly linked to fewer general depressive symptoms, whereas no association between heritage culture orientation and general depressive symptom severity was found. These findings are discussed below.

Depression Severity by Generational Status

Previous findings have been split on whether depression is more prevalent in first-generation or U.S.-born individuals. In this study, U.S.-born Asian Americans reported more severe general symptoms of depression than first-generation individuals. This result is consistent with previous research that has found the lifetime prevalence of major depression in U.S.-born Asians to be higher than in foreign-born Asian Americans (Breslau & Chang, 2006). However, this finding contradicts

TABLE 2

Correlations Between Variables and Descriptive Statistics

Variable	*M*	*SD*	1	2	3	4	5
1. American culture acculturation	6.17	1.42					
2. Heritage culture orientation	6.59	1.51	.33**				
3. General Depressive Symptoms	9.33	6.84	−.23*	−.16			
4. Somatic Symptoms	9.87	6.50	−.17	−.05	.68**		
5. PHQ-9 Cognitive Subscale	4.83	4.02	−.27**	−.14	.95**	.56**	
6. PHQ-9 Somatic Subscale	4.50	3.19	−.15	−.16	.93**	.72**	.78**

Note. * $p = .006$. ** $p < .001$.

Islam et al. (2014) who found no significant difference between first-generation and Canadian-born South Asians. Perhaps differences between living in the U.S. versus living in Canada contributed to the differences in results between these studies. Alternatively, perhaps the reason why the current result is consistent with one previous study and not the other relates to the specific ethnic backgrounds of the participants. Breslau and Chang (2006), whose results were consistent with the current study, had a large number of East and Southeast Asian participants living in the United States, similar to the current sample. In contrast, the participants in Islam et al. (2014), whose results are inconsistent with the current study's findings, were South Asians living in Canada. The participants of the current study, who were dominantly Southeast Asians, might share several cultural similarities to East Asians, and thus be more likely to produce similar results to Breslau and Chang (2006). South Asians' cultural values and customs differ from those of East and Southeast Asians and may be thus more likely to produce different results (Shankar, 1998). This highlights the importance of attending to cultural differences within Asian samples.

Since first-generation Asian Americans were thought to have stronger Asian culture orientation than U.S.-born Asians, we predicted that they would report more somatic symptoms than U.S.-born Asians. This prediction was based on previous findings that having stronger identification with Asian culture was associated with reports of greater somatic symptoms (e.g., Chang et al., 2017). However, contradicting the hypothesis, there was no significant difference between first-generation Asian Americans and U.S.-born Asians in the current study. This finding is consistent with more recent research that found that depressed Chinese Americans presented with predominantly psychological, rather than somatic, symptoms, which the authors suggested might mark a recent change in symptom reporting among Asian Americans (Yeung et al., 2021). More research is needed to see the extent of this phenomenon: Are there specific populations or specific circumstances under which Asian Americans report more psychological vs. more somatic symptoms of depression? In the meantime, clinicians working with Asian Americans would be wise to assess both types of symptoms of depression.

Acculturation and Depression

Given that, in both the current study and past studies, depressive symptoms were found to be more prevalent among U.S.-born Asians compared to first-generation Asians (e.g., Breslau & Chang, 2006), one would expect that higher orientation to American culture would also be associated with higher severity of depressive symptoms. Surprisingly, in the current study, higher acculturation to American culture was associated with lower severity of general depressive symptoms in the current study. It is unclear why the result was in the opposite direction as predicted. However, it is worth noting that we expected the mean American orientation score in U.S.-born participants to be higher than first-generation participants but, surprisingly, the American orientation scores were quite similar across the two groups.

Given that adherence to Asian values has been associated with stigma toward mental illness that could potentially translate into lower reporting of depressive symptoms (Anderson & Mayes, 2010), heritage culture orientation was predicted in this study to have a negative correlation to general symptom severity. However, the data revealed that heritage culture orientation did not have any correlation to the severity of general depressive symptoms.

Thus, although U.S.-born Asian Americans reported more depressive symptoms than first-generation Asian Americans, acculturation to mainstream culture did not seem to underpin this finding. Future research should identify what other aspects of the U.S.-born Asian American experience might drive reports of greater depressive symptoms. Some factors to be considered include identity concerns such as not feeling "Asian enough" or "American enough," lacking a sense of belonging in mainstream America or Asian subcultural communities, and within-family conflict about values and expectations that may be provoked by acculturation differences across generations (Kim et al., 2006).

Limitations and Future Directions

As discussed earlier, first-generation Asian immigrants may hold more stigma against mental illnesses compared to Western-born individuals (Han & Pong, 2015; Livingston et al., 2018). This stigma may result in social-desirability bias among these participants, leading to the unwillingness to acknowledge depressive symptoms. Thus, it is unclear whether the lower prevalence of general depressive symptoms in first-generation participants truly reflects better mental health or was due to response bias stemming from stigmas. For similar reasons, it is unclear whether the symptom reports from participants who scored higher on the heritage orientation subscale were completely reliable. To address this possible source of bias, future research should assess participants' attitudes toward mental illness to see if negative attitudes/stigma can predict a pattern of responses among the participants.

Because the survey was written in English, individuals needed to understand English in order to participate. The results might have been different if Asian Americans who do not speak English were included in the sample. Furthermore, this inclusion would enhance the generalizability of the

results to a broader Asian American population. Future research should include translations of the survey into multiple languages to collect data from non-English-speaking individuals. On a related note, roughly 75% of participants were Southeast Asians with 45.4% of the sample being full Vietnamese. This reduces the confidence with which we can generalize the results to individuals of other Asian ethnicities. Furthermore, due to this disproportionate representation of this subsample, we were unable to compare symptom severity across Asian subgroups, precluding the identification of any within-group differences.

Additionally, the research invitation stated that the study focuses on Asian Americans; thus, participants were aware that they were being evaluated based on their heritage background. Due to the stigma around mental illnesses, there is a possibility that the participants' answers might have been more likely to reflect social desirability bias under these conditions. Certain participants might have wanted to reflect positively on the mental health of the Asian population and therefore might have not endorsed their symptoms of depression.

The first-generation participants were significantly older than the U.S.-born participants in this sample. Given that past studies have found that depressive symptoms are more prevalent among younger people (Villarroel & Terlizzi, 2020), the age difference between the two subsamples confounds age and generational status and offers a plausible alternative explanation for the finding that U.S.-born participants reported greater depressive symptomatology. Additionally, first-generation participants in this sample were more likely to be Southeast Asian, whereas U.S.-born individuals in this sample were more likely to identify as multiethnic or East Asian. This cultural difference between the subsamples is another potential confound. The potential impact of this confound is unclear, as Southeast Asians have been found to have double the depression risk compared to East Asians in a New York City sample (Misra et al., 2020). The strength of these findings might have been more pronounced without this confounding variable.

Among first-generation individuals, their life experiences may vary depending on the age when they migrated to the United States, which may also link to their overall mental well-being. Because first-generation individuals who migrated to the United States at an early age (e.g., infant or toddler) practically grew up in the United States, they may feel more similar to U.S.-born individuals than first-generation individuals who arrived at a much older age. First-generation individuals who migrated to the United States under the age of 17 have been found to have an increased risk of higher depression severity (Lee et al., 2020). In addition to age at the time of migration, one's motivation for migration may be related to both their acculturative strategy (Berry, 1997) and their psychological well-being. For example, a refugee who came to the United States to escape war may have a different experience from someone who came to the country to live with their spouse after marrying an American or to further their education. It should also be noted that the sample mostly represented young and middle adulthood; future research should seek to include the perspectives of older adults. The historical time period during which first-generation Asian Americans migrated may also relate to well-being, particularly those who experienced periods of increased anti-Asian sentiment in the United States. For these reasons, future research should consider how age, time period, and motivations for migration are associated with well-being in first-generation individuals.

Conclusion

This study adds to the current literature on depressive symptoms in Asian Americans. U.S.-born Asian Americans reported greater depressive symptom severity than those born abroad, but the two groups were similar in the types of depressive symptoms exhibited (cognitive vs. somatic). Surprisingly, acculturation to heritage culture was not related to depressive symptoms, whereas those more acculturated to U.S. culture reported less depressive symptomatology. Future research on this topic should seek to identify what aspects of the U.S.-born Asian American experience might drive reports of greater depressive symptoms. Future studies would benefit from including non-English speaking Asian Americans in samples as well as assessing participants' attitudes toward mental illness and age at migration. The findings from this study may help improve the understanding of how depression relates to generational status and acculturation levels in Asian Americans, thus allowing mental health professionals to more accurately diagnose and thus more effectively treat these individuals.

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This study was preregistered at https://aspredicted.org/SR6_Q1T. Materials and data can be accessed at https://osf.io/9j542
Positionality Statement: Anh identifies as a Southeast Asian woman born and raised in Vietnam. She moved to the United States at the age of 18 and has continued to live and work within the Asian American community in Northern California for almost 7 years. Sharon identifies as a cisgender White woman, born and raised in the United States, who has lived and worked in East Asia and South Asia for approximately 5 years. They acknowledge that their perspectives are influenced by their positions within all of these dimensions of identity.

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