AN EXAMINATION OF RELATIONSHIPS BETWEEN MINDFULNESS, PERSONALITY, ANXIETY, AND DEPRESSION IN AMERICANS AND JAPANESE COLLEGE STUDENTS

by

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This thesis was prepared under the direction of the candidate's thesis advisor, Dr. Ryne Sherman, Department of Psychology, and has been approved by the members of her supervisory committee. It was submitted to the faculty of the Charles E. Schmidt College of Science and was accepted in partial fulfillment of the requirements for the degree of Master of Arts.

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ABSTRACT

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Mindfulness – nonjudgmental awareness of the present moment - has recently garnered significant attention in psychological literature for decreasing clinical symptoms. Certain personality traits such as emotionality, however, can predict higher levels of anxiety and depression. The present study examines whether mindfulness mediates the relationship between personality traits and perceived stress and depression in nonclinical populations. A total of 321 participants from two samples—American and Japanese undergraduates —self-reported scores on measures of mindfulness, personality, perceived stress and depression. Cross-cultural comparisons following measurement invariance tests also allow for insight into the definition of mindfulness, especially given the Eastern religion origin of mindfulness. Results demonstrate that mindfulness partially mediates the relationships between personality clinical symptoms, particularly for extraversion and conscientiousness. These results can play an important role for

developing mindfulness-based treatment and prevention programs and bridge an important gap between Western conceived and Eastern religion mindfulness.

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INTRODUCTION

Mindfulness

The thought manifests as the word;

The word manifests as the deed;

The deed develops into habit;

And habit hardens into character;

So watch the thought and its ways with care,

And let it spring from love

Born out of concern for all beings. (Author Unknown - Walsh, 1984)

Mindfulness refers to the ability to think in the present moment, to be cognizant and accepting of one's own thoughts and physical state. It requires "moment-to-moment, non-judgmental awareness cultivated by paying attention in a specific way, that is in the present moment, and is as non-reactively, as non-judgmentally and as open-heartedly as possible" (Kabat-Zinn, 2005, p. 108-109). The clinical implications of mindfulness are recent, but the concepts providing the foundation for mindfulness have existed for centuries in East Asian religions and philosophies (Kabat-Zinn, 2003). Specifically within Buddhism, Right Mindfulness is a factor on the Noble Eightfold Path and is one of the seven factors of enlightenment (Kang & Whittingham, 2010). Being mindful, however, is not only for devout Buddhists.

John Kabat-Zinn's introduction of mindfulness-based stress reduction (MBSR; Kabat-Zinn, 1982, 1990, 2003) in the United States has played a large role in popularizing mindfulness principles in the Western world. Mindfulness has been the subject of increasing psychological research, evidenced by the 4,078 articles published with mindfulness as an index word according to a search on PsycINFO as of March 2015. Its prevalence in American psychology is not surprising; mindfulness and meditation encourage metacognition, increased bodily awareness, and positive thinking, which coincide with cognitive-behavioral therapeutic processes.

A focal point of the current research involves the Western-based measurement of mindfulness in a culture embedded with Buddhism and Eastern philosophies. Mindfulness is often measured using the self-report Five Facet Mindfulness Questionnaire (FFMQ), developed at the University of Kentucky (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006). The FFMQ and other mindfulness measures have been empirically studied in the following nations where Buddhism or similar Eastern religions are present: China (Deng, Liu, Rodriguez, & Xin, 2011), Thailand (Christopher, Charoensuk, Gilbert, Neary, & Pearce, 2009; Christopher, Christopher, & Charoensuk, 2009), and Japan (Sugiura, Sato, Ito, & Murakami, 2012). The five factor structure of the FFMQ has demonstrated good model fit in a Chinese sample (Deng et al., 2011); however, this study was not directly compared to an American sample. Interestingly, between American and Thai college students researchers, found no significant difference between latent means of the Mindful Attention Awareness Scale (MAAS; Christopher et al., 2009). Instead using the Kentucky Inventory of Mindfulness Skills (KIMS; Baer,

Smith, & Allen, 2004), however, the authors found that American students were significantly higher in three of the four subscales measuring aspects of mindfulness.

The Japanese version of the FFMQ was validated by Sugiura et al. (2012) and demonstrated strong model fit indices for a Japanese population. Of particular interest to the current study, the authors demonstrated in a Japanese sample that depressive symptoms showed significant negative associations (*r*)with the following three facets of mindfulness: Acting with Awareness (-.38), Non-judging (-.36), and Nonreacting (-.43). The authors also compared the Japanese results with a comparable American student sample previously collected by Baer et al. (2008). The authors found medium to large differences (Cohen's *d*) between Americans and Japanese for scores on three of the four facets; Americans scoring higher on each one (Sugiura et al., 2012). Although this work was important in the development of a reliable and valid Japanese version of the FFMQ, these cross-cultural samples were not collected at the same time or by the same researchers and interpretations should be made cautiously.

Personality

There are two cross-cultural personality research issues to tackle for the present study: (a) is it possible to find the same personality trait structure (e.g., Five Factor Model) across different cultural populations and (b) is it valid (e.g., appropriate, meaningful) to compare mean level traits of these different populations? Previous large-scale research has demonstrated that universal personality traits exist in a five factor structure. Using the Revised NEO Personality Inventory (NEO-PI-R), researchers have found evidence for a five factor model in three separate studies of 26 cultures (McCrae, 2001), 51 cultures (McCrae, Terracciano, et al., 2005), and 36 cultures (Allik & McCrae,

2004). Furthermore, Schmitt, Allik, McCrae, and Benet-Martinez (2007) found the same five dimensional structure but using the Big Five Inventory (BFI) in 56 nations.

Specific to Japan, Wakabayashi (2014) found the six domains of the HEXACO-PI, a similar measure for the Big Five personality traits with the addition of Honesty-Humility as a sixth trait. When the HEXACO was analyzed with the NEO Five-Factor Inventory (NEO-FFI) and the International Personality Item Pool (IPIP) in 492 Japanese respondents, it showed reliable and useful results indicating potential validity for the measure. Having an established Japanese personality measure is important, but being able to apply it to other psychological constructs and behavioral outcomes contributes much more meaning to psychological literature. The HEXACO has demonstrated this ability empirically, such as in the examination of music preference and personality among Japanese university students (Brown, 2012).

Personality traits can indeed be studied cross-culturally, but can we ensure that these are meaningful comparisons? Research thus far indicates yes. Recent publications propose that some major differences in personality can be explained by cultural variation (Church, 2010; Güngör et al., 2012; Hofstede & McCrae, 2004; McCrae, 2013; Triandis & Suh, 2002). This large body of literature heavily advocates cross-cultural personality trait research as a worthy and meaningful endeavor, but cautions against making sweeping generalizations that leave out distinctive aspects of individual culture.

What personality differences might one expect between Japanese and American individuals? Early work reports lower levels of extraversion and higher levels of neuroticism (used interchangeably with emotionality) in Japanese populations compared to a British population (Iwawaki, Eysenck, & Eysenck, 1977). Later validating and

expanding this claim with improved methodologies in 36 cultures, Allik and McCrae (2004) reported Europeans and Americans to demonstrate higher levels of extraversion and openness than Asians and Africans. Additionally, Europeans and Americans were found to be lower in agreeableness. McCrae and Terracciano (2005) also found higher extraversion in Europeans and Americans and noted specifically that Japanese were low on conscientiousness. In a large cross-cultural study of 56 nations, Schmitt et al. (2007) also found low levels of conscientiousness in Japanese individuals (standardized *t*-score of 37.82 compared to 50 in Americans). Japan and South Korea were, in fact, the lowest in conscientiousness of the entire study. Contradicting earlier findings, Japan also scored the lowest out of all countries on agreeableness (*t*-score of 42.21 compared to United States' 50). Japan was also at the high extreme of the charts for neuroticism (57.87 to United States' 50), scoring as one of the highest nations of the study. Lastly, Japanese individuals were relatively low in openness (41.53) compared to the other 56 nations. The United States did not present such dramatic scores and was, in fact, used as the center for standardization in the study.

Having established that cross-cultural personality differences exist between the United States and Japan; can these differences also predict variability in other psychological constructs? For one example, aggregate differences in personality have been shown to mediate cultural differences in emotion regulation (Matsumoto, 2006). Can culture and personality influence other variables, such as mindfulness or clinical symptomology, as well? Nisbett (2003) argued that Asians and Westerners perceive and understand the world very differently. He notes a 'Chinese tradition' factor that emerges only in Eastern-developed tests of personality. Strongly reminiscent of mindfulness, this

construct is “related to maintenance of interpersonal and inner harmony” (p. 122). Exploring personality alongside mindfulness in Japanese and American individuals will likely shed light on this interesting proposed construct.

Lastly, culture is often conceptualized in terms of collectivist versus individualist societies. Japan is colloquially deemed a collectivist nation, focused on community and shared values, whereas the United States an individualistic nation, focused on personal achievement and values. While this mental framework is convenient and somewhat meaningful to help understand differences, the research does not fully support this dichotomy (Oyserman, Coon, & Kemmelmeier, 2002). In comparing Japanese and American samples, higher scores for individualism were inconsistent depending on slight changes in scale content.

Clinical symptoms: Depression and anxiety/perceived stress

Although the present study does not utilize a clinical population, it is important to establish a general understanding frequency of anxiety and depression between the two populations. Demographically, there is a lower prevalence of mental disorders in Japanese individuals (Kessler et al., 2005). Several empirical studies also show that the prevalence and severity of mental disorders are considerably lower in Japan than in Western countries. Andrade, Caraveo-Anduaga, Berglund, et al. (2003) found the prevalence rate for major depressive episodes to be 16.9% in the United States and only 3% in Japan. More recently, researchers still found Japan to have one of the lowest prevalence rates (2.2%) of major depressive episodes (Bromet et al., 2011). In this same study, Americans presented with 8.3% prevalence. Japanese researchers have also found

a lower prevalence of overall mood and anxiety disorders in Japan compared to Western countries (Kawakami, Shimizu, Haratani, Iwata, & Kitamura, 2004).

The previous literature has demonstrated justification for cross-cultural research on each of the pertinent variables (mindfulness, personality, and clinical symptomology) between American and Japanese individuals. The following provides a framework for why it is important to examine the relationships between the variables within each culture as well.

Mindfulness and personality

A recent meta-analysis of primarily American studies investigating mindfulness and personality show that all of the Big Five traits display some degree of a relationship with mindfulness (Giluk, 2009). Specifically, neuroticism (emotionality) had the largest negative correlation (*r*) with mindfulness (-.45). Conscientiousness showed a strong positive relationship (.32), followed by agreeableness (.22), openness to experience (.15), and extraversion (.12).This meta-analysis improved upon previous studies with inconsistent results, such as extraversion correlating both positively (Baer, Smith, & Allen, 2004) and slightly negatively (Thompson &Waltz, 2007; Waters, 2007) with mindfulness. Neuroticism consistently has a negative relationship with mindfulness; but correlations range from -.28 (O'Loughlin & Zuckerman, 2008; Plaut & Bartlett, 2012) to -.58 (Kostanski, 2007). Specific to the HEXACO measure of personality, Van Doesum, Lange, and Lange (2013) found a positive association between *social* mindfulness and Honesty-Humility. The researchers conceptualize social mindfulness as "other-regarding choices involving both skill…and will…to act mindfully toward another person's control over outcomes" (Van Doesum, Lange, & Lange, 2013, p. 86). The literature indicates

meaningful relationships between mindfulness and personality traits that may be relevant to clinical symptoms as well.

Mindfulness and clinical symptoms

Mindfulness has become a buzz word for psychologists and the media, but is it actually effective for treatment? Does a dose of meditation from the East ease the suffering minds in the West? So far, mindfulness-based programs have shown promising benefits for clinical and non-clinical populations in several reviews and meta-analyses (Brown, Ryan, & Creswell, 2007; Chiesa & Serretti, 2009; Grossman, Niemann, Schmidt, & Walach, 2004; Piet, Wurtzen, & Zachariae, 2012; Smith et al., 2011). Many different variations of mindfulness treatment now exist, such as Mindfulness-Based Cognitive therapy (MBCT), developed specifically to help prevent depressive episodes (Teasdale, Segal, & Williams, 1995).

In nonclinical samples, perceived stress is often measured alongside, or instead of, formal anxiety symptomology, typically used for diagnosis in clinical samples. In the present study, perceived stress is examined as a comparable measure to anxiety. Perceived stress shares a similar negative relationship with mindfulness (Carmody & Baer, 2008; Deckro, Ballinger, Hoyt, Wilcher, Dusek, Myers, et al., 2010; Goodman, Kashdan, Mallard, & Schumann, 2014; Myers, Sweeney, Popick, Wesley, Bordfeld, & Fingerhut, 2012) across a variety of populations. Specific to the present study, a nonclinical sample of college students experienced significant decreases in perceived stress and increases in mindfulness at a one-week follow up of a brief mindfulness meditation session (Stiksma, Levy, &Vernon, 2013).

A meta-analysis (Hofmann, Sawyer, Witt, & Oh, 2010) demonstrated mindfulness-based therapy as a largely effective treatment for anxiety (Hedge's g = .97) and mood symptoms (.95) in clinical populations. In clinical *and* non-clinical populations, the authors also reported effect sizes for improving anxiety (.63) and mood symptoms (.59; Hofmann, et al., 2010). These results support Baer's (2003) meta-analysis estimation of an overall mean follow-up effect size (Cohen's d) of .59 in clinical and nonclinical populations for mindfulness-based interventions.

Specifically in Japan, subjects receiving anticancer treatment were assessed for the efficacy of mindfulness-based meditation therapy on anxiety, depression, and spiritual well-being (Ando, Morita, Akechi, Ito, Tanaka, Ifiuku, & Nakayama, 2009). Anxiety and depression scores significantly decreased after the intervention, implying this mechanism of effect may also be present for Japanese individuals.

Personality and clinical symptoms

Research indicates important personality profile differences for individuals with depressive and anxiety disorders versus those without (Trull & Sher, 1994). Specifically high neuroticism and openness, and low extraversion, agreeableness, and conscientiousness characterized higher symptomology. Later work demonstrated that neuroticism (emotionality) primarily distinguished clinically-diagnosed individuals from others and was particularly important for the presence of comorbidity (Krueger, Caspi, Moffitt, Silva, & McGee, 1996). This implies that personality profile is meaningful when examining someone from a clinical perspective. A recent meta-analysis further found that personality traits are strongly connected to anxiety and depressive disorders (Kotov,

Gamez, Schmidt, & Watson, 2010). Confirming earlier findings, high neuroticism and low conscientiousness are associated with higher symptomology.

In Japan, Matsudaira and Kitamura (2005) conducted a study on personality traits presenting as risk factors of higher levels of depression and anxiety among college students. Using the Temperament and Character Inventory (TCI) as a measure of personality and the Hospital Anxiety and Depression scale (HAD) for clinical symptoms, the authors found evidence that certain personality traits can serve as potential risk factors for higher levels of depression and anxiety. Specifically, depression was predicted by reward-dependence. Anxiety, however, was predicted by a number of different personality traits, such as novelty-seeking, harm avoidance, persistence, self-transcendence, and lower self-directedness. Although the authors utilized a different measure of personality, the ability to predict clinical symptoms from personality is aptly demonstrated in a Japanese sample.

METHOD

The present study aims to better understand the relationships between mindfulness, personality, and clinical symptoms of perceived stress and depression through a cross-cultural examination of individuals from Eastern and Western cultures. This research compares college students from Japan and the United States to examine the relationships among these variables within each culture.

Principal Investigative Questions

1. Do differences exist between Japanese and American populations for the following variables: mindfulness, personality, perceived stress, and depression?
2. Does mindfulness mediate the relationship between personality traits and levels of perceived stress and depression in Japanese and American populations?

Participants

Participants included two samples of undergraduate students from American and Japanese universities: Florida Atlantic University and the University of Tsukuba, respectively. The United States undergraduate sample (n = 216) consisted of students attending General Psychology. Recruited through the subject pool, students chose to participate in the study to fulfill a research requirement. The Japanese undergraduate sample (n = 123) was comprised of students attending introductory courses who chose to participate in the study in exchange for a voucher worth 500 yen (approximately $5.00) to the school book store. After accounting for validity checks (e.g. “Please choose the following option that is a color”) the samples for analysis were n = 198 Americans and

n = 121 Japanese. Samples were relatively equal in terms of gender breakdown (49.7% male in Americans, 47.9% male in Japanese) and age (median of 19 in Americans and 21 in Japanese). The racial breakdown of the samples were an accurate representation of participants' respective university (Americans: 48% Caucasian, 23% Hispanic/Latino, 19% African American, 6% Other, 5% Asian, and 2% No Response; Japanese: 99% Japanese, <1% No Response).

At the university level, Florida Atlantic University and University of Tsukuba are comparable as academic institutions, but it is important to note that the University of Tsukuba admits a higher caliber of student. For the fall 2013 semester, Florida Atlantic University's total enrollment was 30,759 students with an acceptance rate of 47.7%. It does not rank as one of the United States' top 200 schools and is considered a Tier 2 school ("Florida Atlantic University"). University of Tsukuba is ranked as the tenth most prestigious university in Japan and the 34th ranked university in Asian University Rankings 2014 with a total enrollment of 16,422 students. Furthermore, the "Hensachi," a standardized index for alumni success, places the University of Tsukuba as a higher than average-level university in Japan. This does not imply comparisons between the samples are not worthwhile; rather, it is an important factor to note in the interpretation of the results.

Measures

Mindfulness. Five Facet Mindfulness Questionnaire *(*FFMQ*;* Baer, et al., 2006*)* is a 39-item questionnaire measuring dispositional mindfulness (facets: observing, describing, acting with awareness, non-judging of inner experience and non-reactivity to inner experience). Participants report on a 5-point Likert scale from 1 (*Never or very*

rarely true) to 5 (*Very often or always true*). Sample items include, "In difficult situations, I can pause without immediately reacting," and "When I'm walking, I deliberately notice my body moving." In the present study the alphas (α) for the facets in the American sample were .69, .85, .85, .84, .and 67; and in the Japanese sample: .82, .90, .83, .86, and .74.

Self-Defined Mindfulness is a self-report qualitative measure, designed for the present research, which asks participants to define mindfulness or what being mindful means to them in their own words. Participants then rate, on a provided scale, how mindful they regard themselves based on their own definition.

Personality. HEXACO-PI-R (Ashton & Lee, 2004) measures personality in the form of honesty-humility, emotionality, extraversion, agreeableness, conscientiousness, and openness to experience. The HEXACO-PI-R is a 100- item self-report inventory. In the present study, the alphas (α) for the American sample were .81, .81, .86, .85, .82, .and 81, respective to the HEXACO order. High reliabilities were also found in the Japanese sample: .79, .72, .88, .80, .83, and .78.

Clinical. Beck Depression Inventory – II (BDI-II; Beck, Steer, & Brown, 1996) is a well-established self-report questionnaire with 21 items measuring depressive symptoms in a multiple choice format varying in severity. Sample item includes "I do not feel sad" to "I am so sad or unhappy that I cannot stand it." The alphas (α) for the BDI-II of the present study were .88 in the American sample and .91 in the Japanese.

The Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) is a 10-item questionnaire rated on a 5-point Likert scale from 1 (*never*) to 5 (*very often*). Sample items include, "In the last week, how often have you been upset because of something

that happened unexpectedly," and "In the last week, how often have you felt nervous and 'stressed'." Alphas (α) for the present study were .88 in Americans and .78 in Japanese.

Hypotheses

1. Mindfulness levels will be higher in the Japanese than the American sample.
2. Levels of emotionality, agreeableness, conscientiousness, and honesty-humility will be higher in the Japanese sample whereas levels of extraversion and openness to experience will be higher in the American sample.
3. Levels of perceived stress and depression will be higher in the American population than the Japanese sample
4. Mindfulness *will* mediate the relationship between personality traits and levels of depression and perceived stress, particularly for neuroticism.

Planned Analyses

In order to test the preceding hypotheses, a number of statistical approaches were utilized. For hypotheses comparing the Japanese and American samples (hypotheses 1-3), a factor analytic approach was used in order to test for measurement invariance. After evaluating appropriateness of comparing the involved measures, *t*-values and effect sizes (*d*) were analyzed in order to evaluate potential differences between cultures.

Bivariate correlations between the main variables were conducted within each culture to better understand the overall nature of the relationships. To test the main hypothesis (4) of the current research, mediation and moderation analyses tested the multivariate relationships between mindfulness, personality traits, and clinical symptomology. Lastly, also interested in whether culture influences this potential indirect

effect of mindfulness, a moderated mediation analysis was designed. All analyses were conducted using R (R Core Team, 2015).

RESULTS

Between Cultures

Mindfulness. In order to first establish statistically that comparisons can be made across American and Japanese cultures, measurement invariance tests were conducted. For the FFMQ, parceling was utilized due to the five facet nature of the questionnaire and high number of items (39). Parcels were constructed similar to previous cross-cultural FFMQ studies (Deng et al., 2011; Sugiura et al., 212) with approximately three to four items per parcel and three parcels per facet. Parcels were constructed within the five facet structure with random item order but reverse keyed items were put in parcels together. Model fit indices (see Table 1), particularly the Comparative Fit Index (CFI) and Root Mean Square Error of Approximation (RMSEA), indicate configural invariance for the five facet structure (Kline, 2011). The significance of the χ^2 value is likely due to the large number of observations (applicable to subsequent measurement invariance tests as well). Looking at Table 1, as the model number increases, the requirements for demonstrating equivalence becomes more difficult, making it harder to achieve good model fit. Therefore, model comparisons are conducted in order to determine what type of measurement invariance is achieved. The results for the FFMQ indicate evidence for the same factor structure measuring equally across both cultures.

Table 1. *Measurement Invariance Model Fit Indices for FFMQ*

	χ^2	*df*	*p*	CFI	RMSEA	BIC
Models						
Model 1	331.08	160	.00	.90	.08	10356.53
Model 2	353.12	170	.00	.89	.08	10321.05
Model 3	470.53	180	.00	.83	.10	10380.93
Model 4	511.38	185	.00	.81	.11	10393.02
Model Comparisons (results in Δ value)						
Model 1 versus 2	22.045	10	.02	.01	-	-
Model 2 versus 3	117.41	10	.00	.06	-	-
Model 3 versus 4	40.85	5	.00	.02	-	-

Note. 315 of 319 observations were used. Model 1: Configural invariance (same factor imposed on groups). Model 2: Weak invariance: (equal loadings). Model 3: Strong invariance (equal loadings and intercepts). Model 4: Equal loadings, intercepts, and means.

Contrary to hypothesis one, overall mindfulness, averaging across subscales, was higher in the American sample (M = 3.19, SD = .35) compared to that of the Japanese (M = 2.94, SD = .44; t = 5.2, d = .6). This was true for most of the facets of mindfulness as well (see Table 2). Although averaging across facets is typically not calculated in the FFMQ literature, all increases in facets lead to an increase in mindfulness and make for a more parsimonious comparison. Americans also rated themselves as significantly higher than their Japanese counterparts based on their own written definition of mindfulness (t = 11.45, d = 1.31). Interestingly, correlations between overall FFMQ mindfulness and self-defined mindfulness are .26 in Americans and .22 in Japanese. Implications of these results are expanded upon in the discussion.

Table 2. *Comparing Overall Mindfulness, FFMQ Facets, and Self-Defined Mindfulness*

	Americans			Japanese			Comparison	
	M	*SD*	*Median*	*M*	*SD*	*Median*	*t*	*d*
Overall Mindfulness	3.19	.35	3.16	2.94	.44	2.95	5.20	0.60
Mindfulness Facets								
Observing	3.44	.54	3.50	2.98	.76	3.00	5.85	0.67
Describing	3.24	.68	3.25	2.77	.84	2.75	5.16	0.59
Acting with Awareness	3.04	.69	3.00	3.03	.69	3.12	0.13	0.01
Non-judgmental	3.14	.69	3.12	3.10	.83	3.12	0.50	0.06
Non-reacting	3.07	.52	3.14	2.83	.64	2.71	3.49	0.40
Self-defined Mindfulness	3.72	.72	4.00	2.67	.85	3.00	11.45	1.31

Note. n = 198 for Americans, n = 121 for Japanese

Personality. Due to the six factor structure and large number of items (100) of the HEXACO, parceling was utilized. Three to four parcels (of three to six items each) were made for each of the six personality dimensions. Items were grouped according to established personality dimensions of the HEXACO and whether items are reverse keyed. Beyond this strategy, items were parceled randomly, discouraging biases based on item content. Model fit indices for Model 1 indicated a slightly decent model fit of the HEXACO, particularly for the RMSEA value (.01). However, these indices significantly decrease from Model 2 to Model 3 and so forth indicating only configural invariance is achieved (see Table 3). Therefore, while it seems that the usual structure for the HEXACO only fits the data moderately well, it is measuring the factor structure equally across both cultures and thus they can be compared.

Table 3. *Measurement Invariance Model Fit Indices for HEXACO*

	χ^2	*df*	*p*	CFI	RMSEA	BIC
Models						
Model 1	853.13	388	.00	.85	.01	13179.92
Model 2	886.51	404	.00	.84	.09	13121.21
Model 3	1061.22	420	.00	.79	.10	13203.82
Model 4	1153.20	426	.00	.76	.10	13261.27
Model Comparisons						
(results in Δ value)						
Model 1 versus 2	33.38	16	.01	.01	-	-
Model 2 versus 3	174.71	16	.00	.05	-	-
Model 3 versus 4	91.98	6	.00	.03	-	-

Note. 319 observations were used. Model 1: Configural invariance (same factor imposed on groups). Model 2: Weak invariance: (equal loadings). Model 3: Strong invariance (equal loadings and intercepts). Model 4: Equal loadings, intercepts, and means.

Results from *t*-tests indicate important differences between most personality dimensions (see Table 4). Only the dimension of agreeableness yielded a statistically non-significant *t*-value. As predicted, the Japanese sample scored higher for emotionality ($t = 3.16$) and honesty-humility ($t = 4.32$) whereas the American sample showed higher scores of extraversion ($t = 4.25$). Contrary to hypotheses, Americans demonstrated higher scores of conscientiousness ($t = 6.43$), Japanese had higher scores of openness to experience ($t = 2.39$), and no difference was found for agreeableness ($t = .19$).

Table 4. *Comparing Personality Dimensions*

	Americans			Japanese			Comparison	
	M	*SD*	*Median*	*M*	*SD*	*Median*	*t*	*d*
Personality Dimensions								
Honesty-Humility	3.10	.55	3.12	3.39	.59	3.38	4.32	.50
Emotionality	3.21	.55	3.25	3.41	.51	3.44	3.16	.36
eXtraversion	3.42	.59	3.47	3.08	.74	3.06	4.25	.49
Agreeableness	2.98	.58	2.94	2.99	.57	3.00	0.19	.02
Conscientiousness	3.44	.53	3.44	3.01	.62	2.94	6.43	.74
Openness	3.30	.58	3.31	3.46	.60	3.50	2.39	.27

Note. $n = 198$ for Americans, $n = 121$ for Japanese

Perceived Stress. The ten items of the PSS were put into 5 parcels only based on whether the item was reverse keyed. Additionally, parcels 4 and 5 (both keyed negatively) were allowed to covary in the present model. Configural invariance is definitely confirmed for the PSS (see Table 5) and there is also evidence of weak invariance achieved as well given the high CFI and low χ^2, RMSEA, and Bayes Information Criterion (BIC) values. It becomes clear, however, that strong invariance is not achieved given the significant differences between Models 2 and 3. Perceived stress is indeed measuring comparably in the present study. The *t*-test results indicate significantly higher scores of perceived stress in the Japanese sample (see Table 6). These results contradict the hypothesis that Americans would have higher scores of clinical symptomology.

Table 5. *Measurement Invariance Model Fit Indices for PSS*

	χ^2	*df*	*p*	CFI	RMSEA	BIC
Models						
Model 1	2.45	8	.96	1.00	.00	3638.65
Model 2	12.57	12	.40	1.00	.02	3625.71
Model 3	142.69	16	.00	0.79	.22	3732.77
Model 4	145.11	17	.00	0.79	.22	3729.43
Model Comparisons						
Model 1 versus 2	10.12	4	.04	0.00	-	-
Model 2 versus 3	130.13	4	.00	0.21	-	-
Model 3 versus 4	2.42	1	.12	0.00	-	-

Note. 319 of 321 observations were used. Model 1: Configural invariance (same factor imposed on groups). Model 2: Weak invariance: (equal loadings). Model 3: Strong invariance (equal loadings and intercepts). Model 4: Equal loadings, intercepts, and means.

Table 6. *Comparing Clinical Symptom Frequency*

	Americans			Japanese			Comparison	
	M	*SD*	*Median*	*M*	*SD*	*Median*	*t*	*d*
Perceived Stress	3.00	.71	3.00	3.17	0.59	3.10	2.40	.28
Depression	1.55	.43	1.50	1.54	0.45	1.43	0.15	.02

Note. n = 198 for Americans, n = 121 for Japanese

Depression. The model fit indices for depression as measured by the BDI-II are somewhat inconclusive (see Table 7). While the CFI values for Model 1 configural invariance and Model 2 are rather high (.97), the RMSEA (.11) is still above the preferable criterion of .08 for good model fit (Kline, 2011). Interpreting model fit from the CFI values indicate evidence for weak invariance due to the similarities between Models 1 and 2. Interpreting model fit from the RMSEA values, however, indicate using caution when comparing between these cultures. The means for both populations were very similar and reflect the low *t* and *d* values (see Table 6).

Table 7. *Measurement Invariance Model Fit Indices for BDI*

	χ^2	*df*	*p*	CFI	RMSEA	BIC
Models						
Model 1	30.51	10	.00	.97	.11	1724.25
Model 2	40.07	14	.00	.97	.11	1710.80
Model 3	77.53	18	.00	.92	.15	1725.27
Model 4	77.98	19	.00	.92	.14	1719.97
Model Comparisons						
Model 1 versus 2	9.55	4	.05	.01	-	-
Model 2 versus 3	37.47	4	.00	.04	-	-
Model 3 versus 4	.447	1	.50	.00	-	-

Note. 314 of 321 observations were used. Model 1: Configural invariance (same factor imposed on groups). Model 2: Weak invariance: (equal loadings). Model 3: Strong invariance (equal loadings and intercepts). Model 4: Equal loadings, intercepts, and means.

Within Culture Correlations

Americans. For an overall impression of how the primary variables relate to one another within the American sample, multiple bivariate correlations (*r*) were conducted (see Table 8). Of particular interest are the strong positive associations between mindfulness and extraversion (.43), conscientiousness (.41), and openness to experience (.27) and the negative association between mindfulness and emotionality (-.24). Furthermore, both perceived stress and depression negatively correlate with mindfulness (-.51 and -.40, respectively). These parallel relationships further validate the strong positive association (and comorbidity) between perceived stress and depression, a correlation of .58 in the present sample. Lastly, extraversion, conscientiousness, and emotionality show the strongest relationships with perceived stress and depression, of which only emotionality is positive.

Table 8. *Correlation Table for the American Sample*

	MIND	HON	EMO	EXT	AGR	CON	OPEN	PSS	DEP
Mindfulness	-								
Honesty-Humility	.04	-							
Emotionality	-.24	.19	-						
eXtraversion	.43	-.12	-.04	-					
Agreeableness	.09	.25	-.06	.18	-				
Conscientiousness	.41	.17	-.08	.28	.00	-			
Openness	.27	.16	.03	.15	.11	-.01	-		
Perceived Stress	-.51	.08	.35	-.37	-.19	-.41	-.04		
Depression	-.40	.02	.18	-.27	-.08	-.19	-.08	.58	-

Note. $n = 198$

Figure 1. *Heat map of variable intercorrelations for Japanese and American samples*

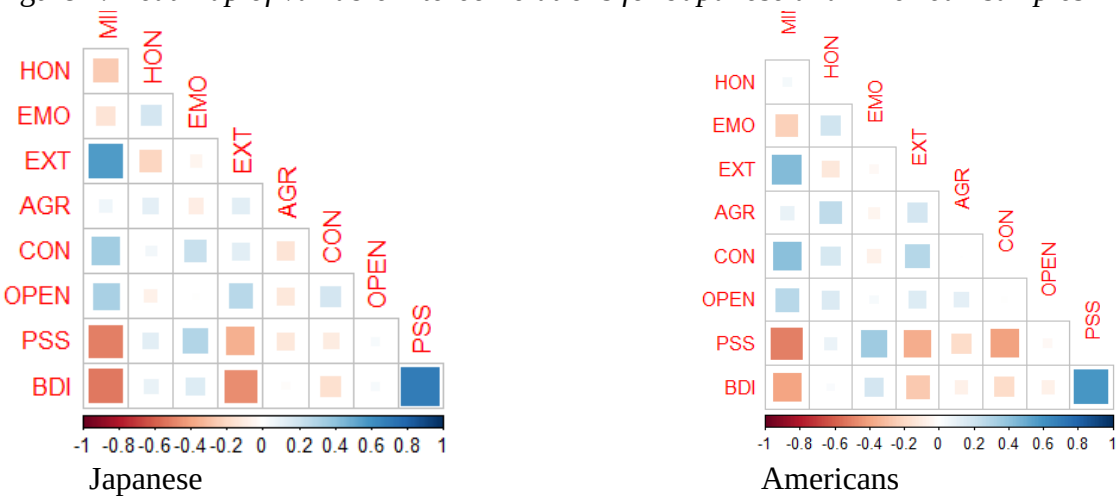


Table 9. *Correlation Table for the Japanese Sample*

	MIND	HON	EMO	EXT	AGR	CON	OPEN	PSS	DEP
Mindfulness	-								
Honesty-Humility	-.26	-							
Emotionality	-.15	.18	-						
eXtraversion	.56	-.22	-.06	-					
Agreeableness	.06	.11	-.10	.12	-				
Conscientiousness	.34	.05	.22	.13	-.15	-			
Openness	.32	-.08	-.01	.27	-.13	.18	-		
Perceived Stress	-.51	.12	.29	-.36	-.13	-.11	.03	-	
Depression	-.53	.09	.15	-.47	-.02	-.17	.03	.69	-

Note. n = 121

Japanese. Overall, the Japanese correlations behave in a similar manner to the American data (see Table 9 and Figure 1). Extraversion, conscientiousness, and openness show strong positive relationships with mindfulness whereas emotionality and honesty-humility demonstrate moderate negative associations with mindfulness. Interestingly, in the American sample, honesty-humility did not show much association with mindfulness (.04), whereas it is the strongest of the negative personality correlations for Japanese (-.26). As expected, perceived stress and depression negatively and strongly correlate with

mindfulness (-.51 and -.53, respectively). The correlation between perceived stress and depression in the Japanese sample is even stronger at .69 compared to the American correlation of .58. The strongest relationship again emerges in the personality dimension of extraversion, negatively associated with both perceived stress (-.36) and depression (-.47). Emotionality shows a moderately low (.15) and moderately high (.29) relationship to depression and perceived stress, respectively. Lastly, conscientiousness and perceived stress correlates rather weakly (-.11) in Japanese individuals compared to the large association in Americans (-.41). Interpretations of these results are elaborated upon in the discussion.

Mindfulness. Integral to the driving force behind the cross-cultural aspect of the present study was the meaning of mindfulness within and across each culture. In an attempt to quantify how mindful Americans and Japanese regard themselves qualitatively, participants numerically rated how mindful they are based on their own written definition of mindfulness. Americans (M = 3.72) still rated themselves significantly higher on self-ascribed mindfulness than their Japanese counterpart (M = 2.67, t = 11.50). Both groups, however, demonstrated low agreement between self-defined mindfulness and their scores on the FFMQ (rs = .26 and .22 in Americans and Japanese).

Mediations

Perceived Stress. Multiple regression mediation analyses were conducted based on the general model outlined in Figure 2 - predicting clinical symptoms from personality dimensions with mindfulness as a mediator.

Figure 2. *General model for mediational analyses with centered variables where total effect (c) = direct effect (c') + indirect effect (ab)*

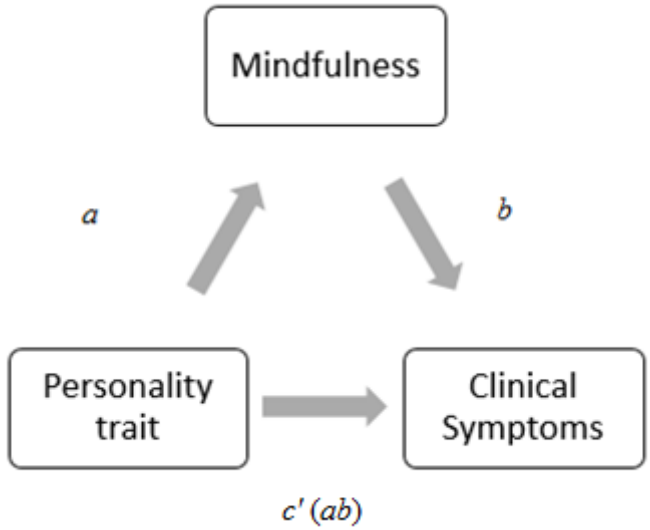


Table 10. *Indirect Effect of Mindfulness Predicting PSS from Personality Dimension*

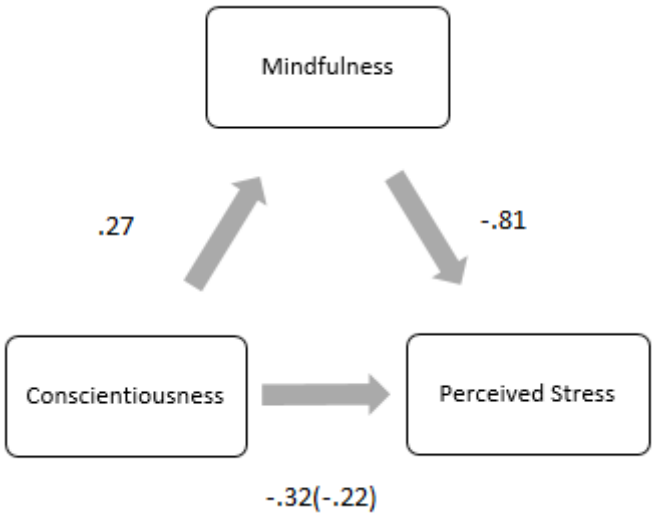
	Americans			Japanese		
	Total effect (*c*)	Direct effect (*c'*)	Indirect effect(*ab*)	Total effect (*c*)	Direct effect (*c'*)	Indirect effect (*ab*)
Honesty-Humility	.11(.09)	.14(.09)	-.03(.05)	.12(.10)	-.01(.09)	.13(.05)
eXtraversion	-.44(.08)	-.22(.09)	-.22(.06)	-.29(.07)	-.09(.08)	-.20(.06)
Emotionality	.45(.10)	.31(.09)	.14(.04)	.33(.09)	.25(.08)	.09(.06)
Conscientiousness	-.54(.09)	-.32(.10)	-.22(.05)	-.11(.10)	.07(.09)	-.17(.06)
Agreeableness	-.23(.11)	-.18(.09)	-.05(.05)	-.14(.09)	-.10(.08)	-.03(.05)
Openness	-.05(.09)	.12(.08)	-.17(06)	.03(.09)	.21(.08)	-.19(.07)

Note. Effect (standard error). *n* = 196 for Americans, *n* = 121 for Japanese

Results from analyses indicate mindfulness is indeed partially mediating the relationship between personality traits and clinical symptomology; indirect effects (*ab*)

typically account for approximately half of the total effect for some dimensions (see Table 10). To better understand table results, refer to Figure 3 as an example of partial mediation – the association between conscientiousness decreases from -.32 to -.22 when mindfulness is included in the model.

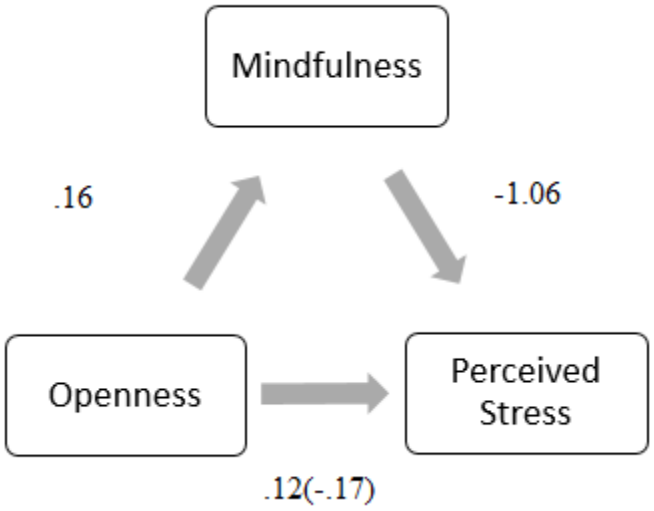
Figure 3. *Direct effect of conscientiousness on perceived stress (-.32) is mediated by mindfulness (-.22) for a total effect of -.54*



Predicting perceived stress in the American sample, indirect effects measured as high as -.22 for extraversion, -.22 for conscientiousness, -.17 for openness, and .14 for emotionality. In the Japanese sample, three of the same personality dimensions demonstrate the highest indirect effects: extraversion (-.20), openness (-.19), conscientiousness (-.17), and honesty-humility (.13). These results contradict the specific hypothesis that mindfulness would absorb most of the effect for the personality dimension in emotionality. The results do, however, provide strong evidence of mindfulness partially mediating the relationship between personality dimensions predicting levels of perceived stress. Of further interest is the presence of suppression (see *Figure 4*). Suppression can be defined as a variable which increases the predictive

validity of another variable by its inclusion in a regression equation (MacKinnon, Krull, & Lockwood, 2000; Tzelgov & Henik, 1991). In both samples, openness to experience demonstrates higher indirect effects (-.17, -.19) than the total effect (-.05, .03) in both Americans and Japanese, respectively. There are also smaller levels of suppression in conscientiousness and agreeableness but only for Japanese participants.

Figure 4. *Suppression example - direct effect of openness on perceived stress (.12) is mediated by mindfulness (-.17) for a lower total effect of -.05*



Depression. Mediation analyses were also conducted for personality dimensions predicting levels of depression in American and Japanese students (see Table 11). Although the total and indirect effects are of lower magnitude, the same four personality dimensions emerge as being the most absorbed by mindfulness (conscientiousness, extraversion, openness, and emotionality) in the American sample. This pattern helps contribute to the reliability of the results. Predicting depression from personality dimensions in Japanese, however, yielded a wildly different picture than any previous analysis. Not having any indirect effect in perceived stress mediations (-.05, -.03) or in predicting depression in Americans (-.02), agreeableness emerged as having the highest

indirect effect (-.15) predicting depression in Japanese and, in fact, indicated suppression (total effect of -.02). Honesty-humility, conscientiousness (only in the Japanese sample), and Agreeableness (only in the American sample) also indicated evidence of suppression. Consistent with all other mediation analyses, extraversion displayed partial mediation of -.13, accounting for approximately half the effect.

Table 11. *Indirect Effect of Mindfulness Predicting Depression from Personality Dimension*

	Americans			Japanese		
	Total effect (*c*)	Direct effect (*c'*)	Indirect effect(*ab*)	Total effect (*c*)	Direct effect (*c'*)	Indirect effect (*ab*)
Honesty-Humility	.02(.05)	.03(.05)	-.01(.02)	.07(.08)	-.04(.07)	.11(.04)
Extraversion	-.20(.05)	-.09(.05)	-.11(.03)	-.28(.06)	-.15(.06)	-.13(.05)
Emotionality	.14(.05)	.07(.05)	.07(.02)	.13(.08)	.06(.07)	.06(.05)
Conscientiousness	-.15(.06)	-.02(.07)	-.13(.03)	-.12(.09)	.01(.07)	-.13(.05)
Agreeableness	-.06(.05)	-.03(.05)	-.03(.03)	-.02(.07)	.01(.06)	-.15(.05)
Openness	-.06(.05)	.02(.04)	-.08(.03)	.02(.07)	.17(.07)	-.02(.04)

Note. Effect (standard error). n = 198 for Americans, n = 121 for Japanese

Moderations

Although the mediation results yielded interesting and interpretable results, moderation effects did not produce any significant interaction terms that would indicate presence of moderation for perceived stress or depression in American or Japanese individuals. Mindfulness does not change the direction of the association between perceived stress and any of the personality dimensions in American or Japanese individuals (see Tables 12 and 13).

Table 12. *Interaction Terms Predicting Perceived Stress from Personality Dimensions with Mindfulness as Potential Moderator in Americans*

	Estimate	SE	*t*	*p*
Coefficients				
Honesty-Humility*FFMQ	.18	.22	.85	.40
Emotionality*FFMQ	.22	.20	1.09	.28
eXtraversion*FFMQ	.13	.18	.75	.45
Agreeableness*FFMQ	.28	.18	1.61	.11
Conscientiousness*FFMQ	-.13	.22	-.62	.54
Openness*FFMQ	.01	.21	.06	.96

Note. n = 198

Table 13. *Interaction Terms Predicting Perceived Stress from Personality Dimensions with Mindfulness as Potential Moderator in Japanese*

	Estimate	SE	*t*	*p*
Coefficients				
Honesty-Humility*FFMQ	-.23	.18	1.27	.21
Emotionality*FFMQ	-.03	.20	0.13	.89
eXtraversion*FFMQ	.09	.10	0.85	.40
Agreeableness*FFMQ	-.04	.18	0.24	.81
Conscientiousness*FFMQ	.20	.14	1.41	.16
Openness*FFMQ	-.06	.16	.39	.70

Note. n = 121

Moderated Mediation

Although planned analyses included testing whether mediations were being moderated by culture, the results from the mediations did not deem this necessary. All mediations were in the same direction between cultures besides effects that are so minimal (e.g., -.01) that very little meaning would be derived from such a test.

DISCUSSION

Between Cultures

Mindfulness. Establishing measurement invariance between cultures in the FFMQ is an inherent step in being able to meaningfully compare mindfulness in Americans and Japanese. Although only weak to moderate measurement invariance was found, model fit indices were only slightly less than results found in previous cross-cultural literature (Deng et al., 2011; Sugiura et al., 2012). The previous literature comparing mindfulness scores between Eastern and Western cultures was inconsistent, indicating either no significant difference (Christopher, et al., 2009) or higher scores in an American sample (Baer, Smith & Allen, 2004; Christopher et al., 2009). Hypotheses assuming a higher level of mindfulness in the Japanese population were largely based upon an Eastern religion presence in Japan. Responses on a religious identification question, however, indicated that 85% of Japanese participants did not identify as having a religion or faith. Other researchers have also speculated that mindfulness is higher in Western samples because of the self-report questionnaire's Western origin and possible bias in item content (Christopher et al., 2009). Interestingly, Americans still rated themselves as higher in mindfulness than Japanese when both were given the opportunity to rate based on their own definition of mindfulness prior to rating the FFMQ. This could, however, simply be due to a North American bias to positively self-regard (Heine, Lehman, Markus, Kitayama, 1999). Text-analysis of participants' mindfulness definitions is ongoing to qualitatively analyze these data. The low agreement between FFMQ scores

and ratings of self-defined mindfulness, however, does not bode well for the generalizability of the FFMQ. If a construct "related to maintenance of interpersonal and inner harmony" (Nisbett, 2003, p. 122) does exist, particularly in Eastern cultures, it is not being captured through the FFMQ. This begs the question: can mindfulness even be measured through a self-report questionnaire? Can a construct focused on paying attention to the present moment be captured through a measure that inherently asks a participant to reflect on the past?

Personality. The well-researched structure of personality traits of the HEXACO indicated decent model fit for the six personality dimensions, but slightly less than one might expect. Consistent with previous literature and hypotheses, Japanese participants demonstrated higher scores of emotionality (Iwawaki et al., 1977; Schmitt et al., 2007) and lower scores of extraversion (Allik & McCrae, 2004; Iwawaki et al., 1977).

Contrary to hypotheses but consistent with previous literature, Japanese individuals scored significantly higher on items of conscientiousness than their American counterparts. Against common perception, past researchers have independently found Japanese to be typically low on conscientiousness (McCrae & Terracciano, 2005; Schmitt et al., 2007) and Americans to be rather high (Schmitt et al., 2007). A potential explanation for this discrepancy between empirical evidence and common perception is a tendency for Japanese individuals to self-efface or be humble (Akimoto & Sanbonmatsu, 1999). They may be less willing to self-report higher scores of a positively regarded trait.

Previous cross-cultural literature on openness to experience was inconsistent; Asians sometimes showing higher (Allik & McCrae, 2004) or lower levels of openness (Schmitt et al., 2007) compared to Americans. In the present study, Japanese were higher

in openness. In line with a collectivist culture, Japanese individuals scored significantly higher on Honesty-Humility than the American sample. However, no difference was found for Agreeableness. Similar to the measure of conscientiousness, the lack of high Agreeableness scores in the Japanese could be due to the tendency unwillingness to self-promote, even on an anonymous questionnaire.

Perceived Stress. Measurement invariance results for the PSS provided good evidence for cross-cultural comparisons. Research and demographic data consistently report that Japanese have a lower prevalence rate of mental disorders (Kessler et al., 2005), even specifically for anxiety (Kawakami et al., 2004). In the present study, however, Japanese students had effectively higher levels of perceived stress over the American sample, contradicting a priori hypotheses. There are several potential reasons for this discrepancy. Firstly, the Japanese student sample is at a higher than average rank university and thus may have increased expectations and stress levels than other Japanese young adults. Furthermore, the goal for this measure of perceived stress was to measure frequency of symptomology, not to diagnose an anxiety disorder. The strong stigma and shame of mental disorders in Japan (Ng, 1997) may be the driving force behind the lower prevalence rates of mental disorders in Japan and higher stress is actually an accurate depiction.

Depression. Measurement invariance analyses for the BDI-II justified comparisons but must be generalized with caution due to the inconsistency between model fit indices. Previous literature and large-scale demographic reports indicated low depression prevalence in Japanese, especially in comparison to the United States (Andrade, Caraveo-Anduaga, Berglund et al., 2003; Bromet et al., Kessler et al., 2005).

The current study, however, demonstrated similar scores of depression between Americans and Japanese. This is somewhat surprising (and contradicts initial hypotheses). This inconsistency could be due to the nonclinical orientation of the samples; there may not be enough symptomology truly present to create an effective difference. Alternatively, American or Japanese students might not have felt comfortable answering honestly due to the face-value nature of the measure (e.g., "I do not feel sad" to "I am so sad or unhappy that I can't stand it") and specific questions regarding suicidality and sexuality.

Within Culture Correlations

Americans.

Personality and mindfulness. Correlates between personality dimensions and mindfulness scores behave in the same direction as previous literature, emotionality being the only negative association with mindfulness (Giluk, 2009). Within this topic the main contribution of the current study is the clarification of extraversion's role with mindfulness. Previous results indicated a rather low (.12; Giluk, 2009) relationship between extraversion and mindfulness and sometimes even a negative one (Thompson & Waltz, 2007; Waters, 2007). The current study, however, shows a strong positive association in both cultures. Furthermore, current results show support for a moderate negative association between emotionality and mindfulness. Previous studies found a large range of associations, some as high as -.58 (Kostanski, 2007), but the present study found scores of -.24 and -.15 in Americans and Japanese, respectively.

For most of the correlations between personality dimensions and mindfulness scores, the data related similarly between Americans and Japanese. Honesty-humility,

however, showed a much higher (-.26) and *negative* association with mindfulness, compared to an essentially non-existent association in the American sample (.04). This also contradicts previous research finding a positive association between social mindfulness and Honesty-Humility (Van Doesum, Lange, & Lange, 2013). It is interesting that mindfulness is associated with dishonesty and a lack of humility *only* for the Japanese sample. Mindfulness, as measured by the FFMQ, is an intrapersonal and introspective process that, to a collectivist culture especially, is inherently associated with attention to oneself and thus a lack of humility. Further results evoke the discussion of a schism between interpersonal versus intrapersonal mindfulness.

Mindfulness and clinical. Relationships between mindfulness and clinical symptoms were consistent with previous literature. Higher levels of mindfulness are frequently associated with lower levels of anxiety and depression (Brown, Ryan, & Creswell, 2007; Chiesa & Serretti, 2009; Grossman, Niemann, Schmidt, & Walach, 2004). Similar negative associations have also been found in a Japanese sample (Ando et al., 2009; Sugiura et al., 2012). This was reinforced in the strong and negative correlations between mindfulness and perceived stress (-.51, -.51) and depression (-.40, -.53) in Americans and Japanese, respectively. These results give further evidence that mindfulness-based treatments and preventions can be effective for lowering clinical symptomology. The comorbidity of depressive and anxious symptoms is alarmingly high, .58 in Americans and .69 in Japanese. These results indicate that mindfulness treatment and preventions should incorporate methods for reducing both symptoms of stress and depression simultaneously, at least for a college student population.

Personality and Clinical. Relationships amongst personality dimensions and clinical symptoms yield interesting results, especially when framed against previous literature. Low extraversion and high emotionality emerge as having the strongest association with perceived stress and depression across both Americans and Japanese, consistent with previous literature (Krueger et al., 1996; Trull & Sher, 1994). To further expand this personality profile, research demonstrates that high levels of emotionality and openness paired with low levels of extraversion, agreeableness, and, in particular, conscientiousness characterize depression and anxiety disorders (Kotov et al., 2010; Trull & Sher, 1994). This 'kiss of death' profile of personality traits could be effectively utilized in designing preventative mental health programs, paying specific attention to which personality traits are most influenced by mindfulness, as indicated in the discussion of mediation results.

It is also interesting to note that when comparing personality traits across the two cultures, the Japanese sample reflects this susceptible personality profile (except for indifferent scores of Agreeableness). Japanese individuals also demonstrate significantly higher scores of perceived stress, adding evidence to this personality profile associated with clinical symptomology. The low prevalence rates of depression and anxiety in Japan remain inconsistent with these findings and call into question the effectiveness of clinical diagnosis in Japan with Western-based measures. It is also important to question whether the increased perceived stress in the Japanese sample is due to their Japanese identity or rather a personality profile that is more common in Japanese individuals. Although outside the scope of the present study, is it even fair to make this distinction?

Lastly of interest between personality traits and clinical symptomology, only a weak negative association (-.11) exists between conscientiousness and perceived stress in the Japanese sample, but it is rather strong (-.41) in the American sample. This might be explained through Americans experiencing relief in accomplishment, getting work done, being organized, etc. This relief in productivity may not exist as predominantly in the Japanese culture due to the high pressure to exponentially succeed; when one goal is achieved, another task is started. Being organized and efficient in Japan may not be rewarding enough to relieve anxiety as it seems to do for the American sample.

Mediations

Perceived Stress. As discussed in the results, the two personality dimensions that consistently show the strongest indirect effect of mindfulness across cultures are conscientiousness and extraversion. Higher levels of extraversion and conscientiousness predict lower levels of perceived stress with mindfulness being an important mediator of this relationship. This information should be incorporated into targeting individuals with lower levels of conscientiousness and extraversion for mindfulness-based treatment and prevention programs. Interestingly, emotionality and perceived stress correlated strongly and positively in both cultures but only showed moderate and weak indirect effects of mindfulness. These results could imply that, while conscientiousness and extraversion predicting perceived stress can partially be explained by variability in mindfulness, emotionality is, in fact, *uniquely* predicting perceived stress.

On the other hand, openness to experience demonstrated minimal relationships to perceived stress in correlational analyses (-.04 in Americans and .03 in Japanese) but showed strong indirect effects in mediation analyses predicting perceived stress (-.17 in

Americans and -.19 in Japanese). This evidence of suppression in the mediation analyses in the American sample indicates that the magnitude of the relationship between openness to experience and perceived stress becomes larger when mindfulness is included in the equation (MacKinnon, Krull, & Lockwood, 2010). There is also evidence of suppression in conscientiousness predicting perceived stress and can be interpreted in the same way.

Depression. In general, the indirect effects of mindfulness are smaller for predicting depression from personality dimensions. Similar to the perceived stress analyses, conscientiousness, openness to experience, extraversion, and emotionality emerge as stronger mediators in the American sample. There is minimal evidence for suppression for openness to religion but the magnitude is so small that generalizations should be made cautiously.

The indirect effects of mindfulness found for depression in the Japanese sample are unlike any previous analyses. The personality dimensions of agreeableness and honesty-humility show strong indirect effects (-.15 and .11, respectively) and lower values of total effect indicate suppression. Broached in previous sections, a potential explanation behind the sudden appearance of agreeableness being mediated by mindfulness is the theory that mindfulness is more of an interpersonal and social concept for the Japanese. This reinforces the colloquial understanding of Japan as a collectivist society and the United States an individualistic society. It may be that mindfulness means 'being mindful *of others*' for Japanese but 'being mindful *of oneself*' for Americans. Furthermore, when looking at the items of the FFMQ, they are only relating to the self (e.g., "I find myself doing things without paying attention," "My natural tendency is to

put my experiences into words," and "I watch my feelings without getting lost in them"). This supposition is further supported by the stronger positive association between mindfulness and extraversion for Japanese (.56) than Americans (.43). While mindfulness is an intrapersonal experience for Americans (and conceptualized as such in most literature), mindfulness is more of an interpersonal experience for Japanese; being aware of others rather than the self. Perhaps incorporating both these perspectives of mindfulness gives validity to the personality construct Nisbett (2003) succinctly describes as "interpersonal and inner harmony" (p. 122). Future research should explore this dichotomous way of thinking about mindfulness. Can one simultaneously be aware of others and the self? How does this attention shift and is one more adaptive than the other?

LIMITATIONS

The limitations of the present study largely lie in the lack of generalizability from participants. Using college student samples provides preliminary evidence of relationships that may or may not occur in the more diverse adult populations. Furthermore, there are qualitative differences between the universities (University of Tsukuba enrolling more academically competitive students) that may be affecting the results rather than cultural differences. A last potential problem based on participants is the issue of social desirability, answering favorably rather than truthfully (Crowne & Marlowe, 1960). Indeed, Japanese individuals tend to display higher levels of social desirability bias than Americans (Bernardi, 2006). All participants, however, were made aware of the anonymity of the data and were not told any hypotheses of the research. Furthermore, Japanese participants completed the questionnaire in a computer lab without the presence of the researchers. Additionally, the higher levels of perceived stress in Japanese individuals assuage this issue of attempting to appear in a favorable manner.

There are also several issues regarding experiment design. The measurement invariance model fit indices could be improved upon providing better justification for comparing cross-culturally. In further studies, multiple measures of mindfulness, personality, and clinical symptoms should be utilized in larger and diverse samples in order to further substantiate results. Lastly, although beyond the scope of the present study, it is also possible that depression mediates the relationship between personality traits and

mindfulness. To better understand the stability and causal effects of the constructs, similar variables should be explored in an experimental design.

CONCLUSION

The results and implications from this research are important for two main reasons. The present study hopes to inspire further research attempting to define mindfulness in relation to interpersonal versus intrapersonal mindfulness, particularly incorporating participants of Eastern cultures and religions. This is a worthy endeavor for psychologists wanting to fully understand mindfulness as a construct and also how it may be a powerful factor for reducing maladaptive symptoms. Secondly, as mindfulness-based interventions and prevention methods are increasing in popularity, it is important to target personality profiles that would most value from a mindfulness-based approach. Individuals low in conscientiousness and extraversion may experience exponential benefits, such as less perceived stress, from an increase in mindfulness. Literature examining the relationship between personality and psychological well-being mediated by mindfulness is growing (Wenzel, von Versen, Hirschmüller, & Kubiak, 2015). This multi-discipline research is in an effort to learn how to both help those that are suffering from clinical symptomology and also improve methods of prevention, such as personality profiling, before (medical) treatment is necessary. The implications from this study make an effort to bridge the research gaps and application between positive, clinical, and personality psychology in order to help make the world a better place.

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