**Comparing Social Anxiety in Japanese and European Americans:
Integrating Measurement Invariance and Prototype Analyses**

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Abstract

Objectives: The current studies examined measurement invariance and prototypical symptoms when comparing social anxiety between Japanese and European Americans.

Methods: Study 1 investigated configural, metric, and scalar invariance for the Social Phobia Scale (SPS) and the Social Interaction Anxiety Scale (SIAS), and their respective short forms (SPS-6 and SISA-6), among 163 Japanese and 193 European Americans. Study 2 examined 20 Japanese and 20 European Americans' responses to a social anxiety prototype vignette and investigated the emotional valence and content themes surrounding the generated descriptions.

Results: Study 1 results supported partial scalar invariance of SPS-6 and SIAS-6, partial metric invariance for SIAS, and configural invariance for SPS. Study 2 found that although most descriptors generated by both groups were negative attributes, Japanese mentioned more neutral attributes than European Americans. Both groups mentioned similar percentages of descriptors consistent with the SPS and SIAS, but the non-invariant item content related to physiological anxiety such as fainting and becoming ill were mentioned more often by European Americans whereas the scalar invariant item content related to communication skills, such as mixing comfortably with others and difficulty talking with other people, were mentioned more often by Japanese.

Conclusions: These findings highlight the need to integrate evidence of both measurement invariance and cultural validity in understanding and measurement of psychopathology across cultures.

Keywords: social anxiety, measurement invariance, cross-culture comparison, prototype analysis, Japanese

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Abundant research has shown that individuals of East Asian cultural heritage, such as Japanese, tend to report higher social anxiety than European Americans (for meta-analyses, see Krieg & Xu, 2015 and Woody, Miao, & Kellman-McFarlane, 2015). However, few studies have investigated whether such cultural comparisons were based on measures with equivalent psychometric properties, and even less is known about whether prototypical symptoms of social anxiety based on Diagnostic and Statistical Manual for Psychiatric Disorders (DSM-5 ; American Psychiatric Association, 2013) and related theoretical models (e.g., Clark & Wells, 1995), were similarly understood and evaluated in East Asian and European American cultures. Therefore, the purposes of the current studies were to (1.) examine invariance of commonly used social anxiety measures between Japanese and European Americans; and (2.) compare Japanese and European Americans' reactions to a vignette of a social anxiety prototype, i.e., description of experiences and symptoms of a socially anxious person based on DSM-5 and related theoretical models.

Comparing Social Anxiety between Japanese and European Americans

Social anxiety is characterized by apprehension in social performance and social interaction situations (American Psychiatric Association, 2013; Clark & Wells, 1995). Both subclinical and clinically significant social anxiety are relatively common (Kessler et al., 1994; Ruscio et al., 2008), and are associated with occupational and social impairment (Aderka, Nickerson, Bøe, & Hofmann, 2012; Wittchen & Beloch, 1996). At least six published studies have directly compared social anxiety between Japanese and European Americans (Dinnel, Kleinknecht, & Tanaka-Matsumi, 2002; Kleinknecht, Dinnel, Kleinknecht, Hiruma, & Harada,

1997; Miwa, 2005; Norasakkunkit & Kalick, 2002; Norasakkunkit, Kitayama, & Uchida, 2012; Zhou et al., 2014). In all six studies, Japanese consistently reported higher social anxiety than European Americans with effect sizes varying from $d = .05$ to $.53$. This finding has also been supported by meta-analyses suggesting a small to moderate effect ($d = .36$) for the difference between individuals of European and East Asian cultural heritage (Krieg & Xu, 2015).

The experience of social anxiety across cultures seems to correspond to cultural variations in the way how self is evaluated in relation to others (Heinrichs et al., 2006; Kitayama, Duffy, & Uchida, 2007; Krieg & Xu, 2015). Studies have shown that in comparison to individuals of European cultural heritage, individuals of East Asian cultural heritage, tend to place stronger emphasis on interdependent and/or less emphasis on independent construal of self, and often selectively attend to how others think of themselves in social interactions (Buttermore, 2009; Okazaki, 1997; Zhou et al., 2014). The heightened sensitivity to social evaluations and concerns about inadvertently embarrassing or offending others may partly explain why Japanese on average may report more experiences of social anxiety than European Americans (Krieg & Xu, 2015; Markus & Kitayama, 1991; Okazaki, 1997). However, nearly all cross-cultural studies of social anxiety relied on standardized social anxiety scales developed in the Western contexts without first examining their measurement invariance, an important step that is necessary for any meaningful cultural comparisons (Little, 1997).

Measurement Invariance

Measurement invariance refers to equivalence in construct and measurement properties when examined among respondents from conceptually different groups (Little, 1997; Vandenberg & Lance, 2000). Tests of measurement invariance provides evidence on whether participants from different groups, such as those of different cultural backgrounds, respond to a

given measure in a conceptually similar manner (Vandenberg & Lance, 2000). Although previous work has demonstrated that the expression of social anxiety in Japan may reflect unique cultural values (Essau, Sasagawa, Chen, & Sakano, 2012; Kleinknecht et al., 1997; Schreier et al., 2010), it remains unclear whether the Western conceptualization of social anxiety and subsequently derived measurement tools are equivalent in Japanese cultural context (Norasakkunkit & Kalick, 2009). The absence of evidence on measurement invariance between Japanese and European American cultures jeopardizes the validity of prior comparisons of social anxiety between these two cultural groups. It was unclear whether the prior cross-cultural comparisons revealed “true” (i.e., latent) mean differences on the underlying construct of social anxiety (Hambrick et al., 2010), or reflected unequal psychometric properties of the scales across cultural groups (Knight & Hill, 1998).

In order to garner statistical evidence for measurement equivalence, a series of tests for measurement invariance have been developed (for a review, see Vandenberg & Lance, 2000). Tests of measurement invariance place increasing constraints on a multi-group measurement model in order to see if the model still fits the data even after certain parameters are constrained to be equal. Thus, tests within this series are hierarchical in nature, which means that invariance at one level must be found for invariance at the next level to be interpreted in a meaningful way. The first level is *configural invariance*, which if achieved, indicates that the number of factors is the same across groups. Upon confirming configural invariance, *metric invariance* can be tested by constraining not only the number of factors, but also items’ factor loadings (Little, 1997). Confirmed metric invariance provides support for an equivalent underlying factor structure across groups, and thus speaks to conceptual equivalence for the construct (i.e., the construct is comprised of the same components across groups). It also forms the basis for testing *scalar*

invariance. With scalar invariance, item intercepts can be further constrained to be equal across groups in addition to previously constrained factor loadings (Meredith, 1993). By constraining item intercepts, we are able to see if responses to items are on the same scale. Confirmed scalar invariance also allows us to determine mean-level group differences in the latent construct of interest (Little, 1997; Meredith, 1993; Vandenberg, 2002).

A Prototype Approach

Examination of measurement invariance represents an important first step in helping cross-cultural and clinical researchers choose appropriate measures in comparing social anxiety between Japanese and European Americans. However, results of measurement invariance alone cannot reveal why certain measures or items fail to achieve equivalence across cultural groups. To further understand social anxiety in Japanese and European Americans, one must take into account how members of different cultural groups understand, evaluate, and react to prototypical symptoms and experience of social anxiety delineated in standardized measures.

To move beyond measurement invariance analyses, the current study sought to compare how Japanese and European Americans would react to and evaluate symptoms and experiences of social anxiety derived from DSM-5 and related theoretical models using a prototype approach. Prototype research has a long history and considerable importance in investigations of psychopathology. The construction of DSM to a large extent was driven by identifying prototypical symptoms that are diagnostic of different psychopathologies (Lilienfeld & Marino, 1999; Maj, 2011). According to Rosch (1978), a prototype is a category or concept identified not by a concrete definition but by a fuzzy representation based on the degree of semantic or utilitarian similarity. The prototype approach assumes that lay people's concepts are often organized around their clearest or prototypical examples that are of "diagnostic" value (Cantor,

Mischel, & Schwartz, 1982; Fehr & Russell, 1984). Thus, presentation of a concept-related prototype such as social anxiety to members of different cultures is supposed to activate other descriptors that are perceived to be most characteristic of this prototype in their cultures. Prior research has shown that the salience or prototypicality of concept-related descriptors may vary across cultures in accordance with predominant cultural values and beliefs (Li, Wang, & Fischer, 2004; Xu, Farver, Yang, & Zeng, 2008). Therefore, examination of the content and emotion valence of prototypical descriptors generated by Japanese and European Americans would provide a unique opportunity to further understand social anxiety among members of these two cultural groups.

The Current Studies

The current studies aimed to understand social anxiety in Japanese and European Americans by integrating measurement invariance and prototype analyses. Specifically, Study 1 examined the measurement properties of the two most commonly used full-length social anxiety scales and their respective short-forms. Study 2 investigated Japanese and European Americans' reactions to prototypical experiences and symptoms of social anxiety, described in a vignette that is based on DSM-5 and related theoretical models. The results of Study 1 and 2 would provide complementary evidence with regard to both similarities and differences in understanding and measuring social anxiety among Japanese and European Americans.

STUDY 1

Study 1 investigated measurement invariance of the Social Phobia Scale (SPS) and Social Interaction Anxiety Scale (SIAS) as well as their short forms, the SPS-6 and SIAS-6. These two popular social anxiety measures were chosen because they had been used to compare social anxiety between Japanese and European Americans more than once (Krieg & Xu, 2015). Study 1

involved three steps. First, we examined the goodness of fit for each measure's proposed factor structures among Japanese and European Americans, respectively. Second, upon finding satisfactory fit for proposed factor models, we then examined configural, metric, scalar invariance for each measure. Finally, measures with evidence of scalar invariance were used to compute and compare latent mean differences, and the items that contributed to non-invariance were identified. The identification of non-invariant items would highlight the importance of further exploring lay people's understanding of social anxiety among Japanese and European Americans in Study 2.

Study 1 Methods

Participants

One hundred and ninety-eight European American undergraduate students (68.9% female) were recruited from a large, public university in Hawaii and completed two commonly used social anxiety measures, the SPS and SIAS and their short forms, SPS-6 and SIAS-6, online in exchange for partial course credit. One hundred and sixty-seven Japanese undergraduate students (71.2% female) were recruited from a medium-sized, private university in the Kanto region of Japan to complete paper-pencil versions of the questionnaires in exchange for extra credit in a psychology course. Completing paper and pencil questionnaires after class represents the most typical data collection procedure used in Japanese universities. All the Japanese participants indicated that they were ethnically Japanese; all European American participants self-identified as "White", "Caucasian", or "European American." Table 1 summarizes demographic characteristics of participants.

Measures

Social Phobia Scale (SPS; Mattick & Clarke, 1998) and Social Phobia Scale – 6 Item Version (SPS-6; SIAS-6; Peters et al., 2011). The 20-item SPS was designed to assess social

anxiety manifested as fear of being scrutinized during routine activities (e.g., “I get nervous that people are staring at me as I walk down the street,” “When in an elevator, I am tense if people look at me”) on a 5-point Likert scale (0 = not at all, 4 = extremely). The SPS demonstrated unidimensionality and ranges from 0 to 80 when summed. When the SPS was examined with diverse U.S. samples¹, test-retest reliability estimates ranged from .54 to .90 and internal consistency measured by Cronbach’s alphas ranged from .89 to .94 (Mattick & Clarke, 1998). Correlations with other social anxiety scales ranged from .31 to .60, providing evidence for convergent validity (Brown, Turovsky, Heimberg, & Juster, 1997; Mattick & Clarke, 1998; Osman, Gutierrez, Barrios, Kopper, & Chiros, 1998). The SPS also demonstrated good discriminate validity among clinical samples of individuals in the U.S. with DSM-III-R (American Psychiatric Association, 1987) diagnoses of social phobia as compared to other clinical samples with agoraphobia, specific phobia, generalized anxiety disorder, panic disorder, or obsessive compulsive disorder (Brown et al., 1997; Mattick & Clarke, 1998).

The SPS has been translated into Japanese (SPS-J; Kanai et al., 2004) and used among clinical and non-clinical samples in Japan (Dinnel et al., 2002; Kanai et al., 2004; Kleinknecht et al., 1997). The SPS was found to have a one-factor structure in Japanese as in American samples, and showed high internal consistency ($\alpha = .91$), high correlations with other social anxiety measures ($r = .38 - .79$), the ability to discriminate between clinical and non-clinical samples, and predictive validity for anxious responses to a speech task (Kanai et al., 2004).

The brief form of the SPS, the SPS-6 (Peters et al., 2011)², was constructed based on item characteristic curves to select the items that demonstrated the best ability to discriminate between levels of a latent social anxiety trait. When being used with a large, diverse U.S. sample¹, the SPS-6 demonstrated unidimensionality when tested via a confirmatory factor

analysis (CFA; Peters et al., 2011), and good internal consistency ($\alpha = .85$; Le Blanc et al., 2014). The SPS-6 was strongly correlated with the original scale ($r = .92$), and demonstrated diagnostic sensitivity, differentiating between U.S. individuals with and without a diagnosis of social phobia, as well as sensitivity to changes in social anxiety during the course of psychotherapeutic treatment (Fergus, Valentiner, Kim, & McGrath, 2014; Le Blanc et al., 2014; Peters et al., 2011). Moreover, the SPS-6 was shown to be metric invariant between groups of American college students and Korean college students (Fergus et al., 2014).

Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) and Social Interaction Anxiety Scale – 6 Item Version (SIAS-6; Peters et al., 2011). The 20-item SIAS was developed to complement the SPS with a different focus on general social interaction anxiety e.g., “I am nervous mixing with people I do not know well,” “I find myself worrying that I won’t know what to say in social situations”) on a 5-point Likert scale (0 = Not at all, 4 = extremely). When being examined with diverse U.S. samples¹, the SIAS’s test-retest reliability estimates ranged from .41 to .86 and internal consistency estimated via Cohen alphas ranged from .88 to .94 (Mattick & Clarke, 1998). Correlations with other social anxiety scales ranged from .31 to .66 (Brown et al., 1997; Mattick & Clarke, 1998; Osman et al., 1998). The SIAS also demonstrated good discriminant validity among U.S. clinical samples with diagnoses of social phobia as compared to other clinical samples (Brown et al., 1997; Mattick & Clarke, 1998). The SIAS was translated to Japanese by Kanai et al., (2004), and had been used among clinical and non-clinical samples (Dinnel et al., 2002; Kanai et al., 2004; Kleinknecht et al., 1997). The psychometric properties were examined in the same manner as the SPS and mirrored those derived from U.S. samples (Kanai et al., 2004).

The brief form of the SIAS, the SIAS-6 (Peters et al., 2011)², was constructed in the same manner as the SPS-6 based on item characteristics curves. Among an ethnically diverse U.S. sample¹, the SIAS-6 demonstrated evidence of unidimensionality, good internal consistency ($\alpha = .79$; Le Blanc et al., 2014), and a strong correlation with the original scale ($r = .88$). Like the SPS-6, the SIAS-6 also demonstrated diagnostic sensitivity, differentiating between individuals with and without a diagnosis of social phobia, as well as sensitivity to changes in social anxiety during the course of psychotherapeutic treatment among individuals in the U.S. (Fergus et al., 2014; Le Blanc et al., 2014; Peters et al., 2011), as well as metric invariance between groups of American and Korean college students (Fergus et al., 2014). A copy of the SPS-6 and SIAS-6 can be found in Appendix A.

Analytic Strategy

Preliminary Factor Analysis. Before examining measurement invariance, a confirmatory factor analysis (CFA) was performed for each measure on each group to ensure that previously identified factor structures fit the data. We used CFA with weighted least squares with means and variances adjustment (WLSMV) method of estimation (Jöreskog, 1990). WLSMV is a robust estimator, appropriate for categorical Likert items, and does not assume normal distribution. We chose to use the WLSMV estimator for all analyses due to a slight skewness (Japanese: 1.11, European American: 0.95) identified in each group's distribution of the SPS-6 scores. Given the oversensitivity of the chi-square goodness-of-fit estimate in large samples (Browne, MacCallum, Kim, Andersen, & Glaser, 2002), we incorporated other fit estimators suggested by Hu and Bentler (1998), who proposed that Comparative Fit Index (CFI) and Tucker-Lewis Fit Index (TLI) values of above .95, and Root Mean Square Estimate

Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) values below .06 indicate good fit.

Testing Measurement Invariance. We applied three measurement invariance models and compared the goodness of fit for each. First, we fit a configural invariance model (Model 1) in which the number of factors and the items that loaded on the factors were the same, but the factor loadings and intercepts were allowed to vary between groups. Second, we fit a metric invariance model (Model 2) in which the factor loadings were constrained to be equal between groups. The lack of metric invariance, i.e., a poorer fit of the metric invariance model in comparison to the configural model (Model 1), would suggest that the scale may not measure the same construct between groups. Third, we fit a scalar invariance model (Model 3) in which the factor loadings and intercepts were constrained to be equal between groups. The worse fit of the scalar invariance model than the metric invariance model would suggest that scores represent different levels of latent traits between groups, and mean comparisons would not be appropriate.

These models were fit to each social anxiety measure using R module ‘lavaan’ (Rosseel, 2012). In addition to evaluating the models with the fit estimators and cutoffs recommended by Hu and Bentler (1998), the McDonald’s Noncentrality Fit Index (MFI; McDonald, 1989) was also calculated for each model. Models were compared through change in CFI and change in MFI as recommended by Cheung and Rensvold (2002). The cutoffs for the change in CFI and change in MFI were .01 and .02, respectively (Cheung & Rensvold, 2002; Meade, Johnson, & Braddy, 2008). If either Model 2 or Model 3 did not show good fit, modification indices were generated and any relevant item parameter that had a χ^2 value greater than 10 was allowed to vary freely between groups (Heene, Hilbert, Freudenthaler, & Bühner, 2012), and this modified model would be retested. If the modified Model 2’s CFI and MFI did not change by more

than .01 and .02 (respectively) when compared to Model 1, the measure was considered *partially metric invariant* across groups. Likewise, if the modified Model 3's CFI and MFI changed little when compared to Model 2, the measure was considered *partially scalar invariant* across groups (Byrne, Shavelson, & Muthén, 1989). While some methodologists rightly caution against modifying a given model based on modification indices (for a relevant debate, see Hurley et al., 1997), partial invariance models may help identify problematic items in measurement invariance studies (Byrne et al., 1989; Marsh & Hocevar, 1985). Further examination of non-invariant items may shed important light on cultural differences in understanding and assessing social anxiety. Therefore, partial invariance models were incorporated into the analytic strategy when applicable.

Latent Mean Differences. When estimating scalar invariance (Model 3) by constraining both item loadings and intercepts, fixing a reference group to “0” (i.e., European Americans) and allowing the Japanese group to vary provides an estimate of mean differences on latent constructs (Sass, 2011). Given that there has been strong arguments made for using latent mean differences as oppose to mean differences of raw scores from manifest variables (e.g., Little, 1997), we estimated latent mean differences in social anxiety between European Americans and Japanese on the measures that were shown to be invariant. These differences were then compared to the overall effect size found in Krieg and Xu's (2015) meta-analysis.

Study 1 Results

Missing Data

Five participants failed to complete the survey halfway through. The remaining 356 participants (193 European Americans, 163 Japanese Nationals) on average had 0.38% of missing data, which were imputed through a multiple imputation algorithm performed on R

module ‘mice’ (van Buuren & Groothuis-Oudshoorn, 2011). After it was confirmed that no values were missing in the entire dataset, the data were subject to further analysis.

Confirmatory Factor Analysis

To examine whether the previously found factor structure for each measure can be replicated in the current study, each measure was fit to their respective factor models for each group before the measurement invariance tests. Each of the measures demonstrated satisfactory model fit among Japanese (*ranges* CFI: .97 – .99; TLI: .97 – 1.04; RMSEA: .00 – .05; SRMR: .03 – .09) and European Americans (*ranges* CFI: .97 – .99; TLI: .97 – 1.03; RMSEA: .00 – .06; SRMR: .03 – .08). Given that each measure adequately fit its respective model for each group, these factor structures were retained when testing measurement invariance.

Invariance Across Measures

Social Phobia Scale (SPS) and its short form (SPS-6). As shown in Table 2, Model 1 for the SPS fit the data well, providing evidence for configural invariance. Compared to Model 1, Model 2 resulted in a change in CFI greater than .01 and a change in MFI greater than .02. Thus, evidence for metric invariance was not attained. Modification indices revealed that the item loadings associated with SPS items 9 (“I get panicky that others might see me faint, or be sick or ill”), SPS item 16 (“When I am in an elevator, I am tense if people look at me”), and SPS item 19 (“I worry that my head will shake or nod in front of others”) contributed to the lack of model fit. We released the item loading constraints for these three items and re-tested a partial metric invariance model (Model 2b). Although the change in CFI was within the acceptable range ($\Delta\text{CFI} = .008$), the change in MFI remained above the .02 cutoff. Thus, evidence for partial metric invariance was not attained and subsequent scalar invariance models were not tested.

For its short form, the SPS-6, Model 1 fit the data well. Compared to Model 1, Model 2's CFI and MFI changed little. Having achieved metric invariance, Model 3 was compared to Model 2. Both Model 3's change in CFI and change in MFI were above the predetermined cutoffs, suggesting a lack of support for scalar invariance. Modification indices revealed that the intercept for SPS-6 item 2 ("I worry about shaking or trembling when I am watched by other people") contributed to this lack of model fit. After releasing the constraint for this item intercept, we retested a partial scalar invariance model (Model 3b). Compared to Model 2, Model 3b's CFI and MFI changed little, providing support for partial scalar invariance.

Social Interaction and Anxiety Scale (SIAS) and its short form (SIAS-6). Model 1 for the SIAS fit the data relatively well, providing evidence for configural invariance (see Table 2). Compared to Model 1, Model 2's change in CFI and MFI were both above the predetermined cutoffs, suggesting a lack of support for metric invariance. Modification indices revealed that the loadings associated with SIAS items 11 ("I find it easy to think of things to talk about"-reversed coded, SIAS item 12 ("I worry about expressing myself in case I appear awkward"), and SIAS item 13 ("I find it easy to disagree with another's point of view"-reverse coded) contributed to the lack of model fit. We released the item loading constraints for these three items and re-tested a partial metric invariance model (Model 2b). Compared to Model 1, Model 2b's CFI and MFI changed little, providing support for partial metric invariance. We kept these item loading restraints and tested scalar invariance (Model 3). Compared to Model 2b, Model 3's change in MFI was greater than the .02 cutoff, suggesting a lack of support for scalar invariance. Modification indices revealed that no item intercept clearly contributed to this lack of fit. Rather the poor fit was largely due to an increase in covariance among problematic items.

For the short form SIAS-6, Model 1 fit the data relatively well, providing evidence for configural invariance. Compared to Model 1, Model 2's CFI and MFI changed little, providing support for metric invariance. Compared to Model 2, Model 3 resulted in a change in CFI greater than .01, and a change in MFI greater than .02, demonstrating a lack of scalar invariance. Modification indices indicated that there was a problematic intercept with SIAS-6 item 6 ("I find it easy to disagree with another's point of view"), which was an item also implicated in the lack of metric invariance with the full version of the SIAS (SIAS item 13). We allowed this item intercept to freely vary between groups and retested a modified scalar invariance model (Model 3b). Compared to Model 2, Model 3b's CFI and MFI changed little, supporting partial scalar invariance without this problematic item.

Latent Mean Difference in Social Anxiety

Given the differences in between-group measurement equivalence among the scales tested, we chose the measures that achieved at least partial scalar invariance for each group, i.e., the SPS-6 and SIAS-6, and regressed them on a higher order social anxiety factor to estimate latent mean differences in social anxiety. Because one item on each scale (i.e., SPS-6 item 2 "I worry about shaking or trembling when I'm watched by other people"; SIAS-6 item 6 "I find it difficult to disagree with another's point of view") demonstrated problematic intercepts, these two intercepts were allowed to vary between groups. The resulting latent mean difference was .28 ($p = .01$), indicating that Japanese scored higher than European Americans in social anxiety when equivalent measures were used. This is similar to the overall effect that Krieg and Xu (2015) found in their meta-analysis ($d = .25$).

Study 1 Discussion

In Study 1, we investigated measurement invariance between Japanese and European Americans on the SPS and SIAS, as well as the short forms, the SPS-6 and SIAS-6. After confirming adequate model fit for each measure in single-group CFAs, we subjected the models to a series of tests for measurement invariance. We found both short forms to be partially scalar invariant when the intercept from a single problematic item from each scale was allowed to freely vary between groups. For the SIAS, partial metric invariance was attained after the loadings associated with three problematic items were allowed to freely vary between groups. Finally, for the SPS, only configural invariance was attained even after adjusting the model to account for problematic item loadings.

The stronger evidence for measurement invariance on short than long forms of SIAS and SPS was in line with the initial psychometric study conducted by Peters et al. (2011). Peters et al. (2001) selected the six items for the SPS-6 and SIAS-6 based on the relative performance in discriminating amongst latent levels of social anxiety among both community and clinical samples using item response theory (IRT). It seems that these high-performing items also reflect common experiences of social anxiety that are similarly understood between Japanese and European Americans.

As shown in Appendix 1, the items that showed scalar invariance on the SPS-6 and SIAS-6 seemed to relate to inhibitory behavior experienced during social interactions (SIAS-6: 1, 2, 5), feelings of physiological tenseness when among others (SIAS-6: 3, 4; SPS-6: 3, 5), and attracting unwanted attention (SPS-6: 1, 4, 6). These three themes correspond to some of the core features of social anxiety as outlined in the DSM-5 (American Psychiatric Association, 2013), such as “...behavioral inhibition” (pg. 205), “show[ing] overly rigid body posture” (pg. 204),

and “diverting attention to others” (pg. 204), providing evidence for the similarity in understanding social anxiety among Japanese and European Americans.

Despite the evidence of partial scalar invariance for SPS-6 and SIAS-6, the few non-invariant items suggest that Japanese and European Americans may view some aspects of social anxiety differently. Among the seven non-invariant items in both short and long forms, two themes emerged: ease of self-expression (SIAS item 11: “I find it easy to think of things to talk about”—reverse coded, SIAS item 12: “I worry about expressing myself in case I appear awkward”, SIAS item 13/SIAS-6 item 6: “I find it difficult to disagree with another’s point of view”) and visibility of anxiety symptoms (SPS item 9: “I get panicky that others might see me faint, or be sick or ill”, SPS item 16: “When I am in an elevator, I am tense if people look at me;” SPS item 19: “I worry that my head will shake or nod in front of others;” and SPS-6 item 2: “I worry about shaking or trembling when being watched by other people.” While a lack of ease of self-expression is typically considered a marker for social anxiety in Western cultures (Summerfeldt, Kloosterman, Antony, & Parker, 2006), they may represent normative experience that is considered appropriate in social situations in some East Asian cultures (Eng, 2013). For instance, disagreeing with someone, an indicator of ease of self-expression, is not often recommended in Japanese culture, and may only be appropriate when one has known their conversation partner for a long time and is approximately equal on the social hierarchy (Carl, Gupta, & Javidan, 2004; Hofstede, 2001; Markus & Kitayama, 1991; Miller, 1991; Mizutani & Mizutani, 1977). Likewise, in settings that stress interdependent self-orientation, being mindful of the impression one is making on others is of increased importance (Hofstede, 2001). Thus, it seems culturally inappropriate to operationalize social anxiety as a lack of ease of self-expression in Japanese culture.

In a similar vein, the lack of invariance for items related to the visibility of social anxiety symptoms (e.g., being observed blushing or trembling) may indicate different tolerance of social anxiety symptoms between these two cultures. Lockhart, Nakashima, Inagaki, and Keil (2008) found that compared to their American counterparts, Japanese children are more optimistic about likelihood of change in undesirable traits or behavior. It is possible that some early socialization experiences in Japanese culture may foster a more tolerant view of social anxiety symptoms, which may in turn lead to rating these symptoms as less severe among Japanese than European Americans. Perhaps, demonstrating some social anxiety symptoms to others work to foster more of an interdependent identity that signals help from others in some Asian cultural contexts such as Japan (Markus & Conner, 2013).

Despite the preliminary support for partial scalar invariance for two short forms of social anxiety scales: SPS-6 and SIAS-6, the identification of non-invariant items on the long forms of each measure suggests that some experience and symptoms of social anxiety may not be understood in the same way among Japanese and European Americans, an issue that was further explored in Study 2.

STUDY 2

Given the identification of non-invariant social anxiety scales and items, Study 2 sought to examine whether a vignette description of prototypical experiences and symptoms of social anxiety based on DSM-5 and related theoretical models, would yield similar or different understanding and reactions from Japanese and European Americans.

Study 2 Methods

Participants

The participants were twenty Japanese undergraduate students and twenty European American undergraduate students recruited via word of mouth. Japanese students came from a large public university in Tokyo, and European American students came from a small, private liberal arts college in the Midwestern United States. Among the Japanese students, sixteen were female and the mean age was 21.78 ($SD = 1.20$). Among the European American students, twelve were female and the mean age was 21.58 ($SD = 2.43$).

Materials

Social Anxiety Vignette. Participants of both cultural groups first read a vignette that depicted a prototypical social anxiety case of a male university student (Steven or Takeshi) based on DSM-5 criteria (American Psychiatric Association, 2013) and related theoretical models of social anxiety (e.g., Clark and Wells, 1995). However, we did not include the term “social anxiety” or “anxious” in English, or “*shakai fuan*” or “*taijin kyofusho*” in Japanese in the vignette. Rather, we focused on behavioral symptoms of a social anxiety prototype based on the most commonly used Western criteria (i.e., DSM) and related theoretical models because (1.) prior comparisons of Japanese and European Americans were largely based on standardized social anxiety measures derived in the Western contexts, and (2.) the DSM and related theoretical models of social anxiety represent the conceptual basis for the measures examined in Study 1.

The vignette was translated into Japanese by a team of two bilingual researchers and extra caution was placed in ensuring that the cultural meaning was conveyed to both groups of participants. The English version of the vignette is as follows:

Steven (Takeshi) is a 21-year-old university student. He works hard, gets good grades, but has a bit of trouble interacting with others. He is very shy, and keeps to himself. When someone speaks to him, he gets a look of panic over his face and freezes. He stammers out a response and excuses himself from the conversation as

soon as he can. If this happens often enough in a given setting, he is never seen in that place again. Steven (Takeshi) avoids eye-contact at all cost, and does not want people to notice him or look at him. When asked, he says that when people look at him, he knows that they are thinking something bad about him or his strange behavior, and this feeling of scrutiny makes him feel faint. The feeling of faintness and sweating, as well as the other person staring at him, distracts him to the point where he cannot do anything. Despite all of this, Steven (Takeshi) does have good friends; he is very close with his middle school classmates, who know him well enough not to put him on the spot. When you talk to his friends or family, they mention all of Steven's (Takeshi's) good characteristics and don't seem to notice his feelings or behavior in other situations.

Upon reading the vignette participants were asked to “please list as many words as you can think of that describe Steven (Takeshi) and his situation.” The descriptors generated by members of both cultural groups represented samples of salient attributes consistent with a prototype of social anxiety. These descriptors were translated into both languages by two bilingual researchers and the number of descriptors was counted for each group.

To explore whether Japanese similarly evaluated symptoms of social anxiety like their European American counterparts, two bilingual raters from each culture read the descriptors in the language in which it was written, and coded emotional valence of each descriptor, defined as evaluative connotation of the descriptors within respective cultural contexts and varied from “positive”, to “neutral”, and then to “negative.” The raters were instructed that a “positive” connotation indicates that the meaning of a descriptor was positive in almost all contexts in their culture; a “negative” connotation indicates that a descriptor would be associated with a negative meaning in almost all contexts in their culture; and a “neutral” connotation indicates that the evaluative meaning of a descriptor is dependent on context and cannot be simply labeled as either positive or negative. The overall inter-rater reliability, estimated via intraclass correlation (ICC), was .93, 95% CI [.91, .95]. When examining the Japanese data only, the ICC was

estimated at .89, 95% CI [.85, .93], and when examining the European American data only, the ICC was .96, 95% CI [.95, .97].

To further explore how the two standardized measures (i.e., SPS and SIAS) used in Study 1 adequately captured Japanese and European American lay people's understanding of social anxiety, the same raters from the two cultures coded the consistency of each descriptor to the symptoms of social anxiety depicted in the 40 items of SPS and SIAS. Specifically, the raters used the 40 items from the SPS and SIAS as the coding protocol, and compared each descriptor generated by Japanese and European American participants to these item-based coding criteria. A descriptor was coded as "consistent" when it was consistent with symptoms described in one of the 40 items, and "inconsistent" when it was not captured by any of the 40 items. The overall inter-rater reliability, estimated via intraclass correlation, was .98, 95% CI [.97, .98], indicating satisfactory consistency between the coders. The ICC was .97, 95% CI [.95, .98], for the Japanese data and .99, 95% CI [.99, .99], for the European American data.

Finally, we explored whether non-invariant items revealed in Study 1 depicted experiences and symptoms of social anxiety that may be more salient in one culture than in the other. Specifically, we examined whether the 40 items of SPS and SIAS, including both non-invariant and invariant items (for comparison purpose), used in Study 1 were mentioned by Japanese only, European Americans only, or members of both groups in Study 2. We expected invariant items to be mentioned in similar frequencies by both cultural groups, whereas non-invariant items to be mentioned more frequently (i.e., more salient or prototypical) by one cultural group than the other.

Study 2 Results

Frequencies and Examples of Descriptors Related to the Social Anxiety Prototype

Japanese respondents generated a total of 123 descriptors ($M = 6.15$, $SD = 3.17$), and European American respondents generated a total of 108 descriptors ($M = 5.45$, $SD = 3.02$). A summary of these descriptors can be found in Appendix B. Examples of relatively common (i.e., more prototypical of the social anxiety prototype) descriptors generated by Japanese respondents included ‘symptoms of nervousness’ ($n = 6$), ‘easily nervous’ ($n = 5$), ‘slow to warm up’ ($n = 5$), ‘shy’ ($n = 5$), ‘introverted’ ($n = 5$), and ‘social interaction anxiety’ ($n = 4$). Examples of common descriptors generated by European Americans included ‘shy’ ($n = 7$), ‘anxious’ ($n = 6$), ‘nervous’ ($n = 4$), ‘insecure’ ($n = 4$), and ‘socially awkward’ ($n = 4$). Thus, it seems that both Japanese and European Americans responded to the social anxiety prototype with some key diagnostic feature of social anxiety, such as nervousness and shyness. At the same time, European Americans but not Japanese also mentioned attributes that were not diagnostic of social anxiety, such as insecurity.

As shown in Appendix B, there were other descriptors that were mentioned less frequently but further highlighted group differences in understanding and evaluation of the social anxiety prototype. Among the Japanese group, descriptors such as ‘tendency to care too much’ ($n = 1$), ‘not good at dealing with the [social] situation’ ($n = 1$), and ‘not understanding what is going on’ ($n = 1$) seem to reflect cultural values of social sensitivity and attunement to others (Lau, Fung, Wang, & Kang, 2009) that are appropriate in cultural contexts that stress interdependence (Markus & Kitayama, 1991). Likewise, other descriptors generated by this group included ‘quiet outside, loud at home’ ($n = 1$) and ‘discrepancy between self-image and other image’ ($n = 1$), which seem to reflect a cultural sensitivity to contextual attributes that define socially appropriate behavior (e.g., Kitayama, Duffy, Kawamura, & Larsen, 2016; Masuda & Nisbett, 2001). Whereas in the European American group, not only were these

descriptors largely absent, but in their place were descriptors of ‘unsure’ ($n = 1$), ‘doubtful’ ($n = 1$), and ‘low self-esteem’ ($n = 2$), which may better reflect Western values on assertiveness and having a strong self-confidence.

Emotional Valence of Descriptors

Among the descriptors generated by Japanese respondents, 8.94% ($n = 11$) had a positive connotation, 27.64% ($n = 34$) were considered neutral, and 61.79% ($n = 76$) had a negative connotation. Among the descriptors generated by European Americans, 15.74% ($n = 17$) had a positive connotation, 12.03% ($n = 13$) were considered neutral, and 72.22% ($n = 78$) had a negative connotation. This difference in proportions was statistically significant ($\chi^2 [3] = 11.33, p = .005$). A follow-up analysis of standardized residuals revealed that it was largely the difference in the neutral category that contributed to the overall difference between the two cultural groups ($\pm 3.15, p = .00$, for neutral compared to $\pm 1.83, p = .07$, and $\pm 1.27, p = .21$, for negative and positive, respectively): Japanese were more likely to mention neutral attributes than European Americans in response to the social anxiety prototype.

The Consistency of Descriptors to the Commonly Used Measures of Social Anxiety (SPS and SIAS)

44.44% ($n = 59$) and 42.75% ($n = 48$) of the descriptors generated by Japanese and European Americans, respectively, were consistent with the symptoms and experiences depicted in the SPS and SIAS. These two percentages did not differ between the two groups, $\chi^2 [1] = 0.02, p = .89$.

Salience of Social Anxiety Symptoms Depicted by Invariant and Non-Invariant Items in Study 1

There were discrepancies in the number of mentions of SPS and SIAS item content in the descriptors generated by Japanese and European American participants across non-invariant, metric invariant, and scalar invariant items ($\chi^2 [2] = 8.23, p = .02$). A follow-up analysis of standardized residuals revealed that it was largely the difference in the non-invariant item content that contributed to the overall cultural differences ($\pm 2.67, p = .01$, for non-invariant compared to $\pm 0.54, p = .59$, and $\pm 1.56, p = .12$, for metric invariant and scalar invariant item content, respectively). Specifically, European Americans were two times more likely to mention experiences or behaviors described in non-invariant items such as visible symptoms of social anxiety (e.g., fainting, blushing, or trembling) or a general feeling of “being awkward” than Japanese participants. The two groups, however, did not differ in their frequencies of mentioning metric or scalar invariant item content.

Study 2 Discussion

In responding to a prototypical social anxiety vignette, both Japanese and European Americans thought about words and phrases mostly with a negative connotation (61.79% and 72.22%, respectively). However, Japanese participants also generated more neutral attributes than European Americans (27.64% and 12.03%, respectively). Thus, overall it seems that social anxiety is viewed negatively in both cultures yet Japanese are more likely to describe social anxiety based on non-negative attributes, such as “sensitive” (*sensai*) or “slow to warm up” (*hitomishiri*) than European Americans. These results are consistent with the cross-cultural literature that stresses how an interdependent self-construal may increase interpersonal sensitivity, a plausible cause for elevated social anxiety (Lau, Fung, Wang, & Kang, 2009; Okazaki, 1997). Due to a cultural emphasis on maintaining group harmony, some researchers argued that certain degree of social anxiety may be functional in some contexts in the Japanese

culture where the total *lack* of social anxiety may be perceived as being not vigilant or considerate of the feelings of others (Kleinknecht et al., 1997). Therefore, the more neutral attributes mentioned by Japanese participants may be partly due to their more normative views of social anxiety in comparison to their European American counterparts.

Members of both cultures also mentioned similar percentages of descriptors consistent with standardized measures of social anxiety, i.e., SPS and SIAS. This result is not surprising given that a large number of attributes, particularly negative ones, were mentioned by both Japanese and European Americans. It should be noted that this remarkable cultural similarity may be partly due to our reliance on DSM-5 in developing the social anxiety vignette, which represents not only the most frequently used set of criteria for mental health problems in Western cultures, but also a popular diagnostic tool in some non-Western contexts such as Japan.

Despite these cultural similarities, the invariant and non-invariant SPS and SIAS items identified in Study 1 differed in their frequencies of being mentioned by Japanese and European Americans. The non-invariant items related to the visible markers of social anxiety or a feeling of awkwardness was mentioned more often by European Americans than by Japanese participants. These non-invariant items seem to capture experiences of social anxiety that may be perceived as relatively normative in Japanese culture where getting panicky or feeling tense when being observed by others reflects desirable attention to social feedback and is thus more tolerated than in the U.S. (Choy, Schneier, Heimberg, Oh, & Liebowitz, 2008; Kleinknecht et al., 1997).

One key limitation of Study 2 was that our sample size was relatively small and possibly not a fair representation of our Study 1 sample. In addition, to align our findings with Study 1 that examined standardized measures developed in the Western contexts, our vignette was

derived from a Western conceptualization of social anxiety, i.e., the conceptual basis for the measures used in Study 1, which may not fully capture experience and symptoms of social anxiety in Japanese culture. One important next step would be to ask both Japanese and European Americans to freely report their understanding of experiences and symptoms of social anxiety. Examination of lay people's views of social anxiety without relying on any Western lens such as DSM would provide additional tests of cultural validity in comparing social anxiety across cultures.

General Discussion

The current studies sought to understand social anxiety in Japanese and European Americans using both measurement invariance and prototype analyses. Focusing on two popular measures (SPS and SIAS) and their short forms (SPS-6 and SIAS-6), Study 1 provided preliminary evidence for partial scalar invariance of SPS-6 and SIAS-6, partial metric invariance for SIAS, and configural invariance for SPS. Though the evidence for scalar invariance is 'partial', Byrne and colleagues (1989) claim that violations of measurement invariance are likely not problematic if only impacting the results of less than 20% of the items. Thus, it seems more appropriate to compare social anxiety between Japanese and European Americans using the short forms of SPS and SIAS rather than the long forms. Fortunately, this is consistent with both researcher and clinician preference for brief measurement tools (Coste, Guillemin, Pouchot, & Fermanian, 1997).

Additionally, the latent mean differences based on the partial scalar invariant measures were consistent with results of previous meta-analyses (e.g., Krieg & Xu, 2015) which showed higher social anxiety reported by individuals of Asian heritage than those of European heritage, providing some support for the validity of prior cultural comparisons. Furthermore, Study 2

showed that the majority of frequently mentioned descriptors by both cultural groups in response to the social anxiety vignette, such as ‘symptoms of nervousness’ and ‘anxious’, were negative attributes that are related to core features of social anxiety delineated in DSM, as well as the symptoms and experiences of social anxiety measured by SPS and SIAS. Thus, results of Study 1 and 2 provided some support for similarities in conceptualization of social anxiety in both cultures.

Despite the cultural similarities, the review of the content of non-invariant items identified in Study 1 suggested some potential cultural differences in conceptualization of social anxiety between Japanese and European Americans. Some non-invariant items such as “I find it easy to think of things to talk about” and “I find it difficult to disagree with another’s point of view” emphasize self-expression which may be perceived as a liability to group harmony in Japanese culture but not in American culture. Other items such as “I worry about shaking or trembling when being watched by other people” and “I get panicky that others might see me faint, or be sick or ill” are related to the visibility of anxiety symptoms. These non-invariant items also varied in their frequencies being mentioned by Japanese and European Americans when responding to the social anxiety vignette in Study 2. It is possible that unskilled self-expression and disagreeing with other’s opinions may be more salient in cultures such as Japan where protecting group harmony is a cultural goal (Eng, 2013), whereas awareness of one’s visible anxiety symptoms would be reduced in a context where one’s attention is other-focused, or interpreted as less pathological because it demonstrates sensitivity toward social feedback in cultures such as Japan.

Limitations and Future Directions

Taken together, the current studies provided initial evidence for both similarities and differences in understanding and measuring social anxiety across cultural contexts. However, there are some limitations that need to be addressed in the future. First, it is important to recognize that measurement tools are culturally bound, and may represent operationalizations of constructs in ways that are understood and evaluated differently in different cultures (Greenfield, 1997; Norasakkunkit & Kalick, 2009). Both the measures and the vignette used in Study 1 and 2 were developed based on Western conceptualization of social anxiety, i.e., DSM definition and related theoretical models of social anxiety, which may not fully capture, or even somewhat misconstrue experiences of social anxiety among Japanese individuals. As mentioned above, there is a need to conduct additional qualitative studies to fully investigate Japanese cultural model of social anxiety and understand how social anxiety may be manifested in symptoms or experiences that is less known to Westerners but rather common among Japanese individuals.

Second, the current studies did not assess *taijin kyofusho* that was hypothesized to be a form of social anxiety related to other-focused attention, or *allocentricism* emphasized in Japanese culture (Kleinknecht et al., 1997). *Taijin kyofusho* refers to other-oriented fear within the larger category of social anxiety disorder (American Psychiatric Association, 2013; Choy et al., 2008). It represents a subtle but potent variation in symptom expressions in social anxiety disorder between East Asian versus Euro-American populations (Zhou et al., 2014). We chose not to examine *Taijin kyofusho* based on both theoretical and psychometric considerations. Although the original conceptualization of *taijin kyofusho* stated that it was a unified construct that provided a complement to the Western conceptualization of social anxiety, more recent studies have described subtypes of the disorder that threaten the original factor structure (Iwata et al., 2011; Suzuki, Takei, Kawai, Minabe, & Mori, 2003). Likewise, there is some debate

amongst researchers as to whether *taijin kyofusho* is purely allocentric or rather masked egocentrism, i.e., is it really the fear of offending others or is it the fear of being evaluated as the person who offends others that defines the experiences of *taijin kyofusho*? Although we chose not to examine *taijin kyofusho* due to the unresolved issues related to both the theory and measure of *taijin kyofusho*, additional effort is certainly warranted so we could better understand unique experience of social anxiety in Japanese culture.

Third, our samples were comprised of mostly female college students that are not representative of the general population. Although Blanco et al. (2008) showed that undergraduates have similar rates of psychopathology to people of the same age in the general population, future studies should investigate measurement invariance and cultural validity in comparing social anxiety among both community and clinical samples.

Despite of these limitations, our study provided evidence for the measurement invariance of the SPS-6 and SIAS-6 between groups of Japanese and European Americans, and revealed both cultural similarities and differences in understanding of social anxiety between Japanese and European Americans. These findings represent important building blocks for future investigations that can further our understanding and improve our measurement of mental health difficulties across cultures.

Footnotes

1: None of these studies reported psychometric properties of the SPS/SPS-6 and SIAS/SIAS-6 for individual ethnic groups.

2: We are aware that there are two six-item versions of the SPS-6 and SIAS-6. In contrast to Peters et al. (2011) used in the current studies, Fergus, Valentiner, McGrath, Gier-Lonsway, and Kim (2012) selected items based on readability rather than psychometric properties. We chose to use Peters et al.'s (2011) version due to the strong item properties identified using Item Response Theory (IRT) analyses. However, it should be noted that Fergus et al. (2014) conducted psychometric analyses of both the Fergus et al. (2012) version and Peters et al. (2011) version of the SPS-6 and SIAS-6 and found that the two versions were similar in most psychometric properties, and that the Peters et al. (2011) version only outperformed the Fergus et al. (2012) version on capturing a wider range of mild to severe anxiety symptoms (Fergus et al., 2014).

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Table 1

Demographic Characteristics of Participants in Study 1

	Japanese ($n = 163$)			European Americans ($n = 193$)		
	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
Age (Years)	21.25	1.61	20 – 35	22.65	3.57	18 – 48
Mother's Education (Years)	14.01	1.47	12 – 18	12.51	5.01	3 – 18
Father's Education (Years)	15.23	1.70	8 – 18	12.90	4.66	5 – 18

Table 2

Model fit and comparisons between Japanese and European Americans in Study 1.

Measure	Invariant?	Model	Model Comparison		Model Fit				
			Δ CFI	Δ MFI	CFI	MFI	TLI	RMSEA	SRMR
SPS	☒	Model 1: Configural	---	---	1.00	1.00	1.00	.000	.059
	☐	Model 2: Metric	.018	.153	.982	.847	.981	.043	.086
	☐	Model 2b: Modified Metric	.008	.071	.992	.929	.992	.029	.079
	☐	Model 3: Scalar	.037	.267	.955	.662	.955	.066	.097
SPS-6	☒	Model 1: Configural	---	---	1.00	1.00	1.00	.000	.044
	☒	Model 2: Metric	.000	.007	1.00	.993	1.00	.000	.057
	☐	Model 3: Scalar	.035	.025	.965	.968	.964	.067	.080
	☒	Model 3b: Modified Scalar	.009	.004	.991	.989	.988	.039	.068
SIAS	☒	Model 1: Configural	---	---	1.00	1.00	1.00	.000	.058
	☐	Model 2: Metric	.024	.277	.976	.723	.975	.060	.088
	☒	Model 2b: Modified Metric	.000	.000	1.00	1.00	1.00	.000	.066
	☐	Model 3: Scalar	.010	.130	.990	.870	.989	.039	.078
SIAS-6	☒	Model 1: Configural	---	---	1.00	1.00	1.00	.000	.029
	☒	Model 2: Metric	.008	.007	.992	.993	.991	.034	.057
	☐	Model 3: Scalar	.043	.040	.949	.953	.947	.067	.083
	☒	Model 3b: Modified Scalar	.000	.000	.994	.994	.993	.029	.060

Note. SPS = Social Phobia Scale; SPS-6 = Social Phobia Scale – Six Item Scale; SIAS = Social Interaction Anxiety Scale; SIAS-6 = Social Interaction Anxiety Scale – Six Item Scale

CFI = Comparative Fit Index; MFI = McDonald's Non-Centrality Fit Index; TLI = Tucker-Lewis Fit Index; RMSEA = Root Mean Square Estimate Approximation; SRMR = Square Root Mean Residuals

Appendix A
SIAS-6 and SPS-6

Instructions: For each question, please circle a number to indicate the degree to which you feel the statement is characteristic or true of you. The rating scale is as follows:

0	1	2	3	4
Not at all characteristic or true of me	Slightly characteristic or true of me	Moderately characteristic or true of me	Very characteristic or true of me	Extremely characteristic or true of me
1. I have difficulty making eye contact with others.			0 1 2 3 4	
2. I find it difficult mixing comfortably with people I work with.			0 1 2 3 4	
3. I tense up if I meet an acquaintance on the street.			0 1 2 3 4	
4. I feel tense if I am alone with just one person.			0 1 2 3 4	
5. I have difficulty talking with other people.			0 1 2 3 4	
6. I find it difficult to disagree with another's point of view.			0 1 2 3 4	
7. I get nervous that people are staring at me as I walk down the street.			0 1 2 3 4	
8. I worry about shaking or trembling when I'm watched by other people.			0 1 2 3 4	
9. I would get tense if I had to sit facing other people on a bus or train.			0 1 2 3 4	
10. I worry I might do something to attract the attention of other people.			0 1 2 3 4	
11. When in an elevator, I am tense if people look at me.			0 1 2 3 4	
12. I can feel conspicuous standing in a line.			0 1 2 3 4	

Note. Items 1–6 are from the Social Interaction Anxiety Scale-short form (SIAS-6), and Items 7–12 are from the Social Phobia Scale-short form (SPS-6).

Appendix B
Ten Most Common Social Anxiety Descriptors and Ratings by Group

Group	Descriptor	Frequency	Emotional Valence	SPS & SIAS Consistency
JN	Symptoms of nervousness (<i>agarishou</i>)	6	neutral	consistent
JN	Easily nervous (<i>kinchou shiyasui</i>)	6	negative	consistent
JN	Slow to warm up (<i>hitomishiri</i>)	5	neutral	consistent
JN	Introverted (<i>naikouteki</i>)	5	negative	consistent
JN	Shy (<i>uchiki</i>)	5	negative	consistent
JN	Social interaction anxiety (<i>shakaifuan</i>)	4	negative	consistent
JN	Communication problem (<i>communication shougai</i>)	4	negative	inconsistent
JN	Unsociable (<i>tsukiai ga warui</i>)	3	negative	inconsistent
JN	Tendency to fear social interaction (<i>taijin kyofu</i>)	3	negative	consistent
JN	Easily embarrassed (<i>hazukashigariya</i>)	3	neutral	consistent
EA	Shy	7	neutral	consistent
EA	Anxious	6	negative	consistent
EA	Introverted	5	neutral	consistent
EA	Insecure	4	negative	inconsistent
EA	Socially awkward	4	negative	inconsistent
EA	Nervous	4	negative	consistent
EA	Scared	3	negative	consistent
EA	Socially anxious	2	negative	consistent
EA	Self-conscious	2	negative	consistent
EA	Uncomfortable	2	negative	consistent

Note: JN = Japanese; EA = European Americans