The Japanese Adaptation of the STAI Form Y in Japanese Working Adults
—The Presence or Absence of Anxiety—

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Abstract: Symptom endorsements and response patterns of 1,862 Japanese adult workers (1,509 males and 353 females) to the Japanese adaptation of the State-Trait Anxiety Inventory Form Y (STAI-JY) items, were examined in this study. The mean STAI-JY State and Trait anxiety scores of Japanese workers were substantially higher than those of American workers reported in the Manual, due primarily to the much higher scores of Japanese workers in responding to the anxiety-absent items. The correlations between the State and Trait anxiety-present scales and those of their anxiety-absent scales' counterparts were higher than those between the State anxiety-present and -absent scales and those of their Trait scales' counterparts. These findings suggested that responses to anxiety-present and -absent items should be considered independently in scoring the STAI-JY scales in Japanese working adults.

Key words: State-Trait Anxiety Inventory, Response pattern, Japanese workers, Anxiety-present, Anxiety-absent

Introduction

Ethnocultural differences in the expression of distress have been studied1-3, utilizing, for example, self-administered depression scales. The expression of distress may be relevant to sociocultural factors, including cultural beliefs and norms4-5. Different cultures often express emotions differently4,6. Recent cross-cultural comparison studies in Japan7-9, using a depression scale, found that the Japanese responses to positively oriented (positive) items differed markedly from those of American or Argentine respondents, whereas responses to negatively oriented (negative) items were comparable between the groups. Japanese respondents were much more likely to choose intermediate (less positive) response alternatives. Iwata and his colleagues1-5 called it “the Japanese have a tendency to suppress the expression of positive affect.”

The corresponding results were also obtained from data of the State-Trait Anxiety Inventory Form Y (STAI-Y)10 in a comparison between Japanese and American university students11. The STAI-Y seemed a good example to confirm the above response tendency, because it consists of both state and trait components, which permits comparison of
both emotional states and personality traits to be examined simultaneously, with nearly equal numbers of anxiety-present (negative) and anxiety-absent (positive) items. However, in a strict sense, this finding is only valid for those aged from about 19 to 24 years, and thus, it cannot be generalized for the Japanese adult population.

To date, little is known about psychometric properties and score distribution of the STAI for adult population in Japan\textsuperscript{12}. This study is the first report on the score levels of the Japanese adaptation of the STAI-Y (STAI-JY)\textsuperscript{13} in a sample of Japanese working population. Its internal consistency reliability is also presented.

Results

Mean scores on the STAI-JY scales

Table 1 reports the means, standard deviations, and $\alpha$ coefficients of the STAI-JY scales by gender and age group. The mean scores were remarkably different between the anxiety-present and anxiety-absent scales for each gender-age subgroup: i.e., for the State scales, differences in score between these scales were more than 10, while those scores became somewhat smaller for the Trait scales. Except for the Trait anxiety-present scale, the gender main effects were significant: i.e., males endorsed more anxiety symptoms than did females. The main effects of age group were all significant: i.e., younger workers endorsed more anxiety symptoms than did middle or senior workers. However, gender by age group interactions were not significant. All but one $\alpha$ coefficient exceeded 0.85. Lower $\alpha$ coefficient (0.80) for the Trait anxiety-present scale in females aged 50 years or older might be attributable to smaller sample size ($N=19$).

These mean scores were compared with those of normative scores for American working adults reported in the STAI-Y manual (p. 5, Table 1)\textsuperscript{10}. The mean scores for the State scale reported in the manual were 35.72 (SD=10.40) for males ($N=1,387$) and 35.20 (SD=10.61) for females ($N=451$). The corresponding Trait scale scores were 34.89 (9.19) and 34.79 (9.22), respectively. The $t$-values for these comparisons were as follows: $t$ (2894)=22.34 and $t$ (802)=11.35 for the State scale for males and females, respectively; $t$ (2894)=29.73 and $t$ (802)=14.19 for the Trait scale for males and females, respectively. These values indicated that all the scale scores were significantly higher among our Japanese adult sample than among the normative American adults (all at $p<.0001$).

Average response patterns on the STAI-JY items

Figure 1 displays the response frequencies for the four response alternatives, for the four types, of state and trait items. The response patterns for all the four types of items were generally comparable between genders, although the response patterns varied considerably between the anxiety-present and anxiety-absent items. The higher score indicated a higher anxiety level, as was the case for anxiety-present items. Age group by gender analyses of variance (ANOVA) were used to evaluate main effects and age by gender interactions for the scores of each scale. The internal consistency of each scale was measured by Cronbach's $\alpha$ coefficient. Correlational analysis was also conducted. The SAS\textsuperscript{14} was used for these analyses.
on ‘Sometimes’ for the Trait anxiety-absent items (both scored 3), while the responses on ‘Often’ (scored 2) were considerably common for the latter items.

Inter-scale correlations of the STAI-JY

Table 2 shows the Pearson product-moment correlations between the scale scores, all of which were highly significant \((p<.0001)\). The correlation between the State and Trait anxiety-absent scales \((r=.71)\) was significantly higher than its anxiety-present scales’ counterpart \((r=.65)\) for males \((\chi^2=10.69, df=1, p<.002)\), but not for females \((r=.67 vs r=.60; \chi^2=2.62, df=1, p=.11)\). These correlations were significantly higher than those between State or Trait anxiety-present and -absent scales: e.g., for males, the correlation between State and Trait anxiety-present scales \((r=.65)\) was significantly higher than the correlation between the State anxiety-present and -absent scales \((r=.49; \chi^2=42.15, df=1, p<.0001)\), while a similar tendency was found for females \((r=.60 vs r=.50; \chi^2=3.42, df=1, p=.07)\). Tests for the difference in correlations of all the other pairs reached at a highly significant level.

Discussion

Although the present sample consisted predominantly of males, it would reflect the general laborforce participation rate of Japanese because of quitting a job due to marriage of female workers. However, smaller sample size of females by age group analysis might limit in part to generalize the present results.

Mean scores of both State and Trait anxiety-absent (positive) scales were much higher than those of the anxiety-present (negative) scales for each gender-age subgroup (Table 1). The average response patterns on the STAI-JY items also revealed that the responses varied considerably between these two types of scales (Fig. 1). For positive items, the response distribution was shifted toward less positive (more anxious) direction, whereas the opposite distribution was observed for negative items. These results corresponded to our recent report for the Japanese university students. Thus, much higher mean scores of both State and Trait scales for our Japanese sample in comparison with those reported for the normative American working adults in the Manual might be attributable to a remarkable response difference between the Japanese and American subjects to anxiety-absent (positive) items, as found in our earlier comparison between Japanese and American students.

Here, these remarkable responses to positive items in the Japanese population could be possibly interpreted by two
alternative explanations: (a) the Japanese respondents are less likely to feel positive affect/feelings (i.e., a lack of positive feelings), (b) the Japanese respondents are more likely to inhibit the expression of positive feelings. Our recent research\(^\text{15}\) revealed that although the aforementioned peculiar response pattern was found for positive affect items with positive wording (i.e., positive feelings), the response pattern for their negatively revised items (i.e., a lack of positive feelings) was approximately similar to that for negative items. We therefore supposed these responses were attributable not to a lack of positive feelings but to an inhibition of the expression of positive feelings in Japanese people.

The reasons why this phenomenon emerges for the Japanese people should be difficult to determine, but Iwata \textit{et al.}\(^\text{8}\) have already discussed some possible explanations as follows. Positive feelings are quite salient in mainstream American culture\(^\text{16}\), so that the American respondents may be encouraged to get such feelings in daily life and to express them (relatively) without hesitation. However, in traditional Japanese society, as in Chinese society, individual psychological well-being is subordinated to the well-being of the group\(^\text{17}\). Maintenance of social harmony is one of the most important values in Japanese society, and thus, the Japanese have been taught since childhood to understate their own virtues and not to behave assertively\(^\text{8}\). Growing up in such a Confucian society might lead a person to pay much attention to group situation and interpersonal relations\(^\text{8}\). This tendency is presumably reflected in the Japanese mentality and cognitive style, as exemplified by the relativistic or external standard in life philosophy. We speculate that the Japanese may judge positive affect and affairs through a comparison with other (i.e., relativistic judgement), and thus, the Japanese are more likely to have a moderate but not strong level of positive affect, resulting in the predominance of intermediate responses to positive items\(^\text{8}\).

In addition, the virtue of modesty, a traditional norm

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<th>Table 2. Inter-scale correlations of the Japanese adaptation of STAI-Y</th>
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</tr>
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<tr>
<td>Correlations between state and trait scales</td>
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<td>Anxiety-present (negative)</td>
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<td>Anxiety-absent (positive)</td>
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Table entities indicate inter-correlations (and their 95% confidence intervals). All the correlations are significant at \(p<0.0001\).
induced by Confucian ethics, also have an indispensable effect on the Japanese mentality. For example, even when a person regards himself as being as good as others, the person would hesitate to voice this opinion because such behavior is considered to be impolite (in many cases) in a Confucian society. Kirmayer mentioned that in some cultures the suppression of distress could be a means of successful coping, and, at the same time, might provide a mark of moral distinction. The suppression of positive affect may represent a moral distinction and socially desirable behavior in Japanese society. Considering these socio-cultural context, we hypothesize that the aforementioned cognitive style and social desirability tendencies could have interacting effects on the response patterns of Japanese people.

Iwata et al. noted a possibility that anxiety-present (negative) feelings of Japanese students might be (at least somewhat) easier fluctuated by external situations than anxiety-absent (positive) feelings. This consideration was partly supported by a recent factor-analytic study on the STAI-JY in which the variance explained by the “anxiety-presence/absence” component was greater than that of the “state/trait anxiety” component, based on the unrotated principal component structure. This indicated that the effect of positive or negative questions on responses was greater than that of the state-trait measuring concept in Japanese people, whereas the state/trait distinction was more effective in American people. If this were the case, it would be suggested that, at least based on the psychometric point of view, the state-trait concept may not be necessarily adapted to anxiety-absent feelings of the Japanese population.

The inter-scale correlations (Table 2) seemed supportive to this caution. The correlations between the State and Trait anxiety-absent scales were significantly higher than those of their anxiety-present scales’ counterparts, as well as than those between the State anxiety-present and -absent scales and/or those of their Trait scales’ counterparts. This result suggested that anxiety-absent (positive) feelings of the Japanese population were relatively stable, as compared to anxiety-present (negative) feelings, regardless to the state-trait measuring concept, although a two-wave study protocol should be needed to make clear an adaptability of the state-trait concept for both anxiety-absent and -present feelings. This result corresponded to that reported for the Japanese university students, but was in contrast with that reported for the American students, for which these correlations were at the same level. All these findings could be regarded as supportive evidences to Iwata et al.‘s hypothesis, “the Japanese have a tendency to suppress the expression of positive affect.”

Another research revealed that positive affect items with positive wording were not able to discriminate Japanese depressive out-patients from their demographically matched general controls, whereas their negatively revised items were able to do well. Whether anxiety-absent or -present items of the STAI-JY were able to assess Japanese patients with anxiety disorders in comparison with general controls shall be investigated in the future study.

In conclusion, this study presented basic data, such as mean scores and internal consistency reliability, of the Japanese adaptation of the STAI-Y in a sample of Japanese working adults. We also reconfirmed a peculiar difference in responses to anxiety-absent (positive) and -present (negative) items, which has been reported for Japanese university students. We should take this response tendency into account at the use of this kind of self-administered questionnaire for the Japanese population. Responses to anxiety-present and -absent items should be considered independently in scoring the STAI-JY scales.

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