Development of the Other As Shamer scale Japanese version using Item Response Theory

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Research note

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Abstract

Objective; External shame is reflective of a person's anxiety that he or she might be rejected by others. The Other As Shamer Scale (OAS) is a scale for assessing external shame. The Japanese version of OAS was developed, and its reliability and validity were examined using Item Response Theory (IRT).

Results; A questionnaire survey was conducted with university students (N=199). Exploratory factor analysis of the results indicated a significantly high factor loading on the first factor, which was identical to the original version of the scale, as well as high internal consistency. Moreover, results confirmed that each item had adequate discrimination and information levels, suggesting that external shame could be discriminated with high accuracy with a wide range between relatively low and relatively high external shame groups. These results suggested that this scale could be used for screening external shame as a stress factor and for assessing intervention effects.

Introduction

Shame can be a social event (e.g., being judged and shamed in the eyes of others) or a private feeling linked to our personal judgments of our feelings, fantasises abilities, and characteristics. Shame can guide behavior, influence feelings about ourselves, shape the sense of self-identity and feelings about our social acceptability and desirability [1-3].

Correlations between shame and many psychiatric symptoms have been indicated, which include borderline personality disorders[4], eating disorders [5,6], anxiety[7], depression[3,8,9], and paranoia [10], among others. Therefore, shame is an essential factor related to mental health.

According to Gilbert [11], there are two types of shame. One is "Internal shame," which is related to the internal dynamics of the self and how the self, judges, and feels about itself [11]. Internal shame relates to the tendency to attend to negative aspects of the self and to maintain global self-judgments of the self as bad, inferior, and flawed[1-3]. The other type is "External shame," which is associated with the following tendencies; being worried that others would see the self as uninteresting or boring and thus would be rejected or excluded from valuable relationships [11]. External shame has been defined as shame that arises primarily from the process of being shamed by others, which is the source of this type of shame [1,11].

External shame is caused by consciousness of others, i.e., the idea that the self is negatively evaluated by others, which is correlated with depression[12], the body image in eating disorders[6], and the self-image in social anxiety disorders[13]. However, in Japan, there are no standardized scales for measuring external shame.

Moreover, it has been suggested that most stress response scales in Japan have been developed based on the classical test theory[14]. Classical test theory has a significant problem that survey results are highly affected by the characteristics and quality of the sample because statistics are defined based on

the population[14] Item Response Theory (IRT) is a paradigm for solving this problem. Different from reliability coefficient that previously assessed the mean accuracy of the whole scale, in IRT, the accuracy of measurement is expressed as the function of characteristic values on a continuous scale indicating latent traits (θ), and the point at which a measurement value with high accuracy is indicated about the whole test, as well as based on each item. Therefore, the appropriateness of each item can be judged from the perspective of the measurement purpose of the test[15]. Moreover, the practical utility of the scale can be examined from diverse perspectives.

Based on the above, this study aims developing the OAS Japanese version for assessing trait shame, especially external shame, and its reliability and validity were examined. Moreover, its measurement accuracy was examined using IRT.

Methods

Participants;

Responses were collected from university students (N = 205). Among them, the data of 199 participants were used for the analysis after excluding 6 participants that did not respond to all or a part of the questions. Among the 199 participants, 130 (65%) were women, and 2 had an unknown gender. The age range of the participants was 18-36 years (M = 19.68; SD = 1.62).

Measures;

The Japanese version of Other As Shamer Scale (OAS)

OAS is a self-report instrument composed of 18 items assessing external shame (Goss, Gilbert & Allan, 1994) [16]. Respondents are asked to indicate the frequency of their feelings and experiences related to each item on a 5-point scale ranging from 0 (*Never*) to 4 (*Almost Always*).

After getting the approval of the original authors, two experts, including the author, translated the original version of the scale into Japanese. Two native English speakers from Crimson Interactive Japan Co., Ltd. conducted the back translation, and the translated sentences were compared with the original English, which indicated differences in the meaning of certain items. Therefore, the Japanese translation was revised, and the back-translation was repeated, which confirmed no differences in the meaning between the original and the translated versions of the scale. The English version of the scale resulting from the back translation was sent to two original authors, one of whom pointed out differences in the meaning of specific items. After several discussions with the authors, the Japanese version of the scale was revised according to the advice of the original authors, which indicated sufficient consistency of the scale. Finally, the Japanese version of OAS was developed.

The Japanese version of the Beck Depression Inventory-II (BDI-II)

Construct validity of the Japanese version of the OAS was examined based on the correlation with depressive tendencies using the Beck Depression Inventory-II (BDI-II) developed by Beck et al. [17]. The Japanese version of BDI-II has been developed by Kojima et al. [18], and it has demonstrated a high degree of validity and reliability as an assessment scale of depression.

As described above, correlations between OAS and depressive symptoms have been demonstrated repeatedly by previous studies. Allan et al. [19]examined correlations between external shame and depressive tendencies based on correlations between OAS and the Beck Depression Inventory (BDI), which indicated a high positive correlation (r= .58 to .73). It was expected that this study would also demonstrate a correlation between OAS and BDI-II to), similar to Allan et al. [19]

Procedures;

A questionnaire survey was conducted in three universities in Japan. It was conducted for anonymous for ethical reasons. Written explanations were provided to participants in advance regarding the purpose of the survey, the protection of their personal information, and the voluntary nature of participation. If the participants responded to the survey, it was regarded that they gave their consent for participation. This study was conducted after obtaining the approval of the ethics committee of Chiba University (No. 3441).

Data analysis was conducted using SPSS Statistic ver26. The Graded Response Model (GRM), which is applicable to multi-item tests, was employed in the IRT analysis because OAS uses a five-point scale. EasyEstGRM [20] was used for the calculation. We used D=-1.7 as the scale factor for calculating the discrimination parameters.

Results

First, confirmatory factor analysis was conducted using the principal factor method, which indicates that the contribution of the first factor was 52.86% (eigenvalue=9.72), the second factor was 6.78% (eigenvalue=1.22), and the third factor was 5.73% (eigenvalue=1.03). These results confirmed that that scale had a one-factor structure based on the high contribution ratio of the first factor and differences in eigenvalues. Moreover, the reliability of the scale was examined using Cronbach's α, which was .942, indicating a significantly high internal consistency that was identical to the original version of the scale.

Next, the construct validity of the scale was examined through correlation analysis between OAS and BDI-II, which indicated a high positive correlation ($r = .57$, $p < .001$) similar to Allan et al. [19]

In conducting the IRT analysis, point-biserial correlation coefficients were calculated, and a one-factor factor analysis was conducted using Polychoric Correlation Coefficients. The results indicated a range of point-biserial correlation coefficients from .53 to .84, which is suggestive of a high positive correlation. Moreover, the results of one-factor factor analysis using Polychoric Correlation Coefficients indicated that

the eigenvalue of the first factor was 10.53, the second factor was 1.26, and that the third factor was 1.06. The differences between eigenvalues suggested a one-factor structure for the scale.

Table 1 shows the results of calculating the discrimination and difficulty parameters of each item using GRM. Figure 1 shows the category response curve of each item, and Figure 2 shows the test information curve of the whole scale. It can be seen that the mean discrimination parameter was 1.3 (.70~2.0) with no extreme dispersion, although Item 4 (.70) and Item 11 (.73) had relatively low values compared to the other items. These results indicated that each item had middle or very high discrimination. The difficulty parameters did not show a significant deviation; b1: -.52□-.3.3, b2: .73□-1.6, b3: 2.1□-.65, and b4: 3.0□.71. Moreover, only b1 of Item 11 was relatively high, -3.3, suggesting a high tendency to respond when the item was applicable.

The test information curve expresses a trapezoid shape confirming that the amount of information was relatively high in the range between latent trait values of -1.8 (error=.29) and 2.4 (error=.28), shifting towards the X-axis in a positive direction. The maximum value of test information was 27.6 (error=.19), which was achieved when the latent trait value was 1.1.

Discussion

The purpose of this study was to develop the Japanese version of OAS, examine its reliability and validity as well as the discrimination ability of each item using IRT. The factor structure and internal consistency of the OAS were examined using exploratory factor analysis, which indicated the high contribution ratio of the first factor (52.86%). Moreover, Cronbach's α was .94, indicative of its high internal consistency. The original version of the scale also had a high factor loading on the first factor (the contribution of the first factor was 44%, the second factor was 7.2%, and the third factor was 9.2%), whereas the Cronbach's α was .92. These findings confirmed that the Japanese version of OAS had an identical factor structure and internal consistency to the original version of the scale.

The results of the IRT analysis examining the measurement accuracy of the scale indicated that the discrimination parameter of each item was included in the range between .70 and 2.0, which indicated no extreme dispersion. However, Item 4 (.70) and Item 11 (.73) had relatively low values compared to the other items. According to Baker's □21□ criteria of the discrimination parameters, Item 4 and 11 could be included in the "middle level," and the other items could be included in "high" or "very high" levels. Therefore, the discrimination ability of the scale was considered to have reached a sufficiently adequate level.

Regarding the range of the possibility of practical use of this scale, the information curve obtained in this study indicated a relatively high degree of information in the range between latent trait values -1.8 and 2.4. Results also confirmed that the measurement accuracy of the scale was maintained in groups with relatively low or moderately high latent trait values. Therefore, the analysis of the measurement accuracy of the scale confirmed that each item of the Japanese version of OAS has appropriate

discrimination and information and could adequately discriminate external shame in the range between relatively low to moderately high levels.

It is suggested that the reliability and validity of the scale should be further examined in the future.

Conclusions

This study indicated that each item of the Japanese version of OAS has appropriate discrimination ability and information, and could discriminate external shame in the range from relatively low to moderately high levels with high accuracy. Therefore, it is possible to use this scale as a screening test of external shame, as well as examine the effects of interventions for depression, among others.

Limitations

A limitation of the present study is that test-retest reliability was not investigated. It is suggested that future studies should examine the test-retest reliability of the scale to confirm the stability of the scale. Also, the construct validity of the scale was not sufficiently examined in this study. Previous studies have indicated correlations between external shame and depression as well as various factors that aggravate mental health, such as “anger.” It is suggested that future research should investigate whether the same correlations can be observed in the Japanese version of the OAS.

Abbreviations

OAS
Other as shamer scale
IRT
Item Resonse Theory
BDI-Ⅱ
Beck Depression Inventory-Ⅱ
GRM
Graded Response Model

Declarations

Ethics approval and consent to participate

The study was approved by the ethics committee at the Chiba University Graduate School of Medicine (Reference Number: 3441). Written explanations were provided to participants in advance regarding the purpose of the survey, the protection of their personal information, and the voluntary nature of participation. If the participants responded to the survey, it was regarded that they gave their consent for participation.

Consent to publish

Not applicable.

Availability of data and materials

The datasets generated or analysed during the current study are available are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' Contributions

YH designed and managed the study, performed the statistical analyses, and drafted the manuscript. KA supervised the overall implementation of the study. ES supervised ethics approval and consent to participate. YK supported translating the OAS. JB and KG checked the back translation of the scale and confirmed consistency of the scale. KA, TS, AE conducted a questionnaire survey.

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Table

Due to technical limitations, table 1 is only available as a download in the supplemental files section.

Figures

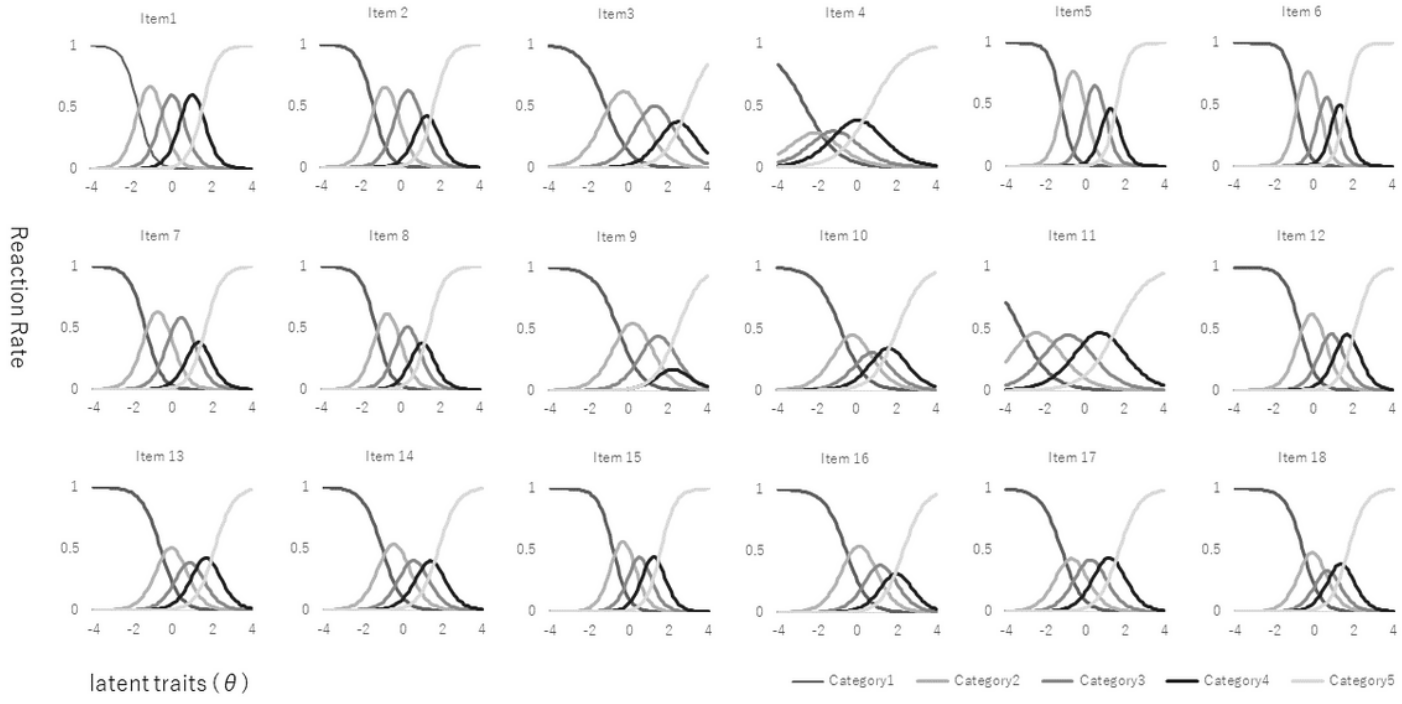

Figure 1: Category response curve of each item

Figure 1

Category response curve of each item.

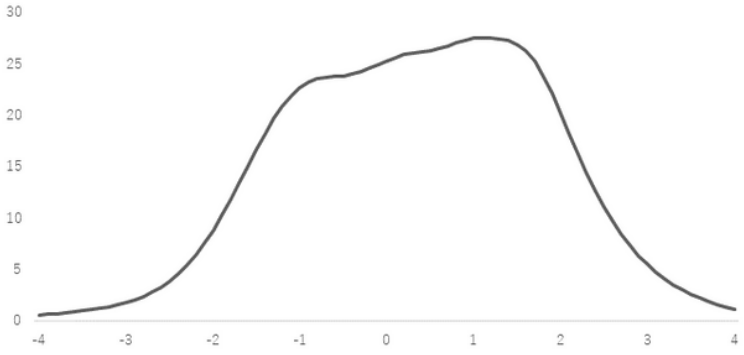

Figure2; Test information curve of all items

Figure 2

Test information curve of all items.

Supplementary Files

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- Table.PNG