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RESEARCH PAPER

Cross-Cultural Adaptation and Reliability Analysis of the Urdu Version of the Neuroception of Psychological Safety Scale (NPSS-G)

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ABSTRACT

The objective of the present study was two folded. The first purpose of the study was to translate and adapt the Neuroception of Psychological Safety Scale – Generic Version (NPSS-G) into Urdu, the national language of Pakistan, and the second was to estimate its reliability. This study comprised of two phases. Initial stage focused on the translation and cultural adaptation of NPSS-G in context of Pakistani culture. In this phase, the NPSS-G was translated and adapted into Urdu following the stages of forward and backward translation. Cross-language validation was assessed using a bilingual group design. The total scores of both the adapted and original versions showed a significant correlation (r = .956**) at the .01 alpha level. In the second phase, the reliability of the Urdu version was established by administering it to a randomly selected sample of 324 participants aged 20 to 30 years from different educational institutes of the city of Lahore, Pakistan. Cronbach's alpha for total psychological safety was found to be .938. The three subscales—Social Engagement, Compassion, and Body Sensation; also showed significant inter-scale correlations ($p < .01$). The test retest reliability (r=.671) was significant at .01 alpha level. The results show the Urdu NPSS-G is a consistent and accurate measure for gauging psychological safety. It offers up a foundation that does support indigenous research, also allowing applications within clinical, educational, plus organizational settings. It also lays the foundation so they can develop more culturally relevant indigenous scales in this domain inside Pakistan.

| **KEYWORDS** | Neuroception, Psychological Safety, Polyvagal Theory, Translation, Adaptation, Reliability |

Introduction

The feeling of safety emerge from the physiological state of human body which is regulated by autonomic nervous system. Earlier research work mostly handled the concept of psychological safety from the subjective perspective. Admitting that feelings of safety can be measured by underlying neurophysiological phenomenon change the direction of investigations on the concept of feelings of safety from a subjective to an objective approach. In journey to understand the human motivation to feel safe, feelings of safety may to be conceptualized from the Polyvagal Theory. According to this theory, the idea of "*neuroception*" mentions to the detection of threat and safety on the subconscious level which further not only influences our physiological states but also emotional regulation process (Porges, 2022). Based on this theory "Neuroception of Psychological Safety Scale (NPSS)" is a measurement tool which is designed to measure the perception of individual on the neurophysiological basis regarding safety, danger, and life threat (Morton et al, 2021).

Literature Review

Earlier to the development of the NPSS, several measurement tools which were designed to evaluate the psychological safety of the individual from different aspects, though each with limitations. For instance, Edmondson (1999) developed a measure focused on team dynamics and interpersonal risk-taking in organizations. On the similar pattern Veale and colleagues (2016) developed the Therapeutic Environment Scales (TESS) which comprised of safety subscale specific to therapeutic contexts. Likewise Richter and colleagues (2009) also introduced the Early Memories of Warmth and Safeness Scale (EMWSS) to assess individuals' recollections of early experiences of safety and warmth. While these tools added valuable insights, but their focus was mostly on specific environments or reflective self-report and missed the physiological aspect which is the foundation in phenomenon of safety perception as mentioned by Dr. Porges in his polyvagal theory.

To address this gap, in the ground of psychological safety, Morton and colleagues (2021) developed the (NPSS) which in comprehensive way evaluate psychological safety across three domains: social engagement, compassion, and bodily experiences. Since its development, this scale has been translated and validated in multiple languages, including Italian (Poli & Miccoli, 2024). Additional validations in European and UK adult samples further confirmed its measurement invariance and psychometric strength (Lutz, Morton, & Porges, 2024a, 2024b). Moreover, the Traumatic Stress Research Consortium lists translations in Bosnian, Greek, Dutch, and Spanish as available or forthcoming, highlighting its growing cross-cultural relevance (Traumatic Stress Research Consortium, n.d.).

Despite this global interest, no reliable and validated Urdu-language instrument was available to measure the neuroception of psychological safety in the Pakistani context. Specified Pakistan's discrete sociocultural and linguistic structures, there was need to adapt and validate the NPSS-G for Urdu-speaking populations to confirm the availability of culturally sensitive assessment tool and its application in research area.

The main goal of current study was to translate and culturally adapt the NPSS into Urdu language and further extend it in to reliability assessment within a sample of Pakistani adults. The translation process followed strict international rules, including forward translation and further backward translation, expert review, and cross-language validation using a single-group bilingual design. Subsequently, psychometric analyses were conducted to determine internal consistency, test-retest reliability, and inter-subscale correlations of the Urdu version. The translation and adaptation of NPSS-G fortified the application of psychological safety assessment and provides a groundwork for future studies into the neurophysiological aspects of emotional well-being in Pakistan.

Material and Methods

The main objective of current study revolves around the psychometric evaluation of the translated Urdu version of the (NPSS-G). The research design selected was cross-sectional design, involving multiphasic procedure to ensure the translated version conserved its conceptual, linguistic, cultural, and matric equivalence. This multi-phase approach is connected with international standards for test translation and validation (Behr, 2017; Epstein et al., 2015).

Participants

Different participants were enlisted for different phases of the study. In all phases the bilingual adults (aged 20 to 30 years) were randomly selected from the different undergraduate and post graduate educational institutes of Lahore, Pakistan. Initially for cross-language validation, 50 bilingual adults were approached. In second phase of reliability assessment, 50 participants were randomly selected for test-retest assessment and further for the Cronbach alpha assessment, a sample of 324 Urdu-speaking adults was approached following the inclusion criteria mentioned initially. Participants were screened to ensure proficiency in Urdu and basic literacy.

Instrument

Neuroception of Psychological Safety Scale – Generic Version (NPSS-G) The NPSS-G is a 29-item self-report measure intended to measure the perception of psychological safety, based on principles of the Polyvagal Theory (Porges, 2022). Items are scored on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scale includes three subscales: Social Engagement (14 items), assessing perceived interpersonal and environmental safety; Compassion (7 items), measuring empathy, pro-social behavior, and social bonding; and Bodily Sensations (8 items), evaluating internal cues of calmness and physiological regulation. High scores showed higher perception of psychological safety. The original scale has demonstrated excellent internal reliability having Cronbach's alpha values of .95 (total), .94 (Social Engagement), .90 (Compassion), and .93 (Bodily Sensations) (Morton et al., 2021).

Procedure

To ensure applicability of this scale in the Pakistani context, a demanding translation and adaptation process was followed, consistent with international guidelines (Hambleton & Zenisky, 2011; WHO, 2020).

Formation of the Translation Committee

A translation committee was formed, consisting of four bilingual experts proficient in both Urdu and English and two PhD-level psychology interns. All members were skilled in psychometrics.

Forward Translation

The NPSS-G was firstly translated from English language to Urdu language independently by four translators—three clinical psychologists and one consultant language expert in Urdu. The committee then reviewed all versions, discussed item meanings, and selected the most culturally appropriate and semantically accurate expressions.

Backward Translation

The Urdu version was independently translated back into English by two mental health professionals unfamiliar with the original scale. The committee compared the back-translated version to the original NPSS-G to identify discrepancies and revised items that lacked conceptual or semantic equivalence.

Cross-Language Validation

The translated version of scale endured cross-language validation using a single-group bilingual design (Sireci, 2005). Fifty bilingual participants completed the Urdu and English versions of NPSS-G, with administration order counterbalanced. After a one-week interval, the same participants completed the opposite version. This method helps address issues of recall bias and practice effects, although residual familiarity with test content remains a limitation (Behr, 2017).

Pilot testing

A pilot study with 30 participants was conducted to assess the comprehensibility, clarity, and cultural appropriateness of the Urdu version. Participants provided qualitative feedback, leading to minor adjustments in wording to ensure relevance to the Pakistani sociocultural context.

Reliability Assessment

The second stage assessed the psychometric reliability of the Urdu version of NPSS-G. For internal consistency, the scale was administered to a sample of 324 participants from Lahore. For test-retest reliability, 50 participants completed the Urdu version twice, with a one-week interval. These steps aimed to determine the stability and consistency of the adapted measure over time.

Statistical Analyses

Statistical analyses were achieved using SPSS version 25. Cronbach's alpha was used to assess internal consistency of the total scale and its subscales. Pearson Product-Moment Correlation Coefficient was used to examine cross-language validity and test-retest reliability, in line with psychometric standards (Field, 2018; Kline, 2016).

Ethical Considerations

The formal permission was obtained from the original authors of the Neuroception of Psychological Safety Scale – Generic Version (NPSS-G) before the conduction of this project. All ethical guidelines for research involving human participants were strictly followed throughout both phases of the study. Participants were debriefed regarding purpose, procedures, and voluntary nature of their participation. Written informed consent was obtained from all participants before data collection. They were assured of their right to withdraw from the study at any stage without any penalty. Confidentiality and anonymity of participants were maintained by coding the data and avoiding any identifying information in the research records or reports.

Results and Discussion

For the cross language validation and temporal reliability the Pearson product moment correlation was conducted. Cronbach's alpha was also calculated in the reliability assessment procedure for viewing internal consistency of data.

Cross language validation: The equivalence between Urdu version and original English version of NPSS-G was calculated and are shown in Table 1 and Table 2. The correlations of all items of Urdu version show significant relationship with the English (original) version at the significance level of .01 as shown in Table 1.

Table 1
Cross Language Validation (item by item) of Urdu and English Versions of Neuroception of Psychological Safety Scale – Generic Version (NPSS-G)

Item No	Correlation
1	.965**
2	.941**
3	.934**
4	.823**
5	.854**
6	.955**
7	.875**
8	.811**
9	.890**
10	.634**
11	.752**
12	.827**
13	.658**
14	.825**
15	.831**
16	.614**
17	.648**
18	.795**
19	.678**
20	.776**
21	.800**
22	.651**
23	.805**
24	.508**
25	.671**
26	.711**
27	.825**
28	.810**
29	.982**

Note. N = 50, 1-week inter-test interval

The evaluations of cross language validation between subscales of Urdu and English version of NPSS-G shown in Table 2.

Table 2
Estimates of Cross Language Validation of Sub-scales of Urdu and English (original) Version of Neuroception of Psychological Safety Scale – Generic Version (NPSS-G)

Scales	Pearson correlation
Social Engagement	.978**
Compassion	.900**
Body Sensations	.910**
Total	.956**

Note. N = 50, 1-week inter test interval, ** correlation is significant at .01 level

Table 3
Test-Retest Reliability (item by item) of Urdu Version of Neuroception of Psychological Safety Scale – Generic Version (NPSS-G)

Item No	Correlation
1	.597**
2	.698**
3	.671**
4	.705**
5	.676**
6	.723**
7	.734**
8	.769**

9	.589**
10	.568**
11	.721**
12	.679**
13	.661**
14	.678**
15	.624**
16	.775**
17	.651**
18	.712**
19	.755**
20	.640**
21	.653**
22	.610**
23	.623**
24	.688**
25	,672**
26	.637**
27	.596**
28	.597**
29	.624**

Note. N = 50, 1-week inter-test interval

Table 4
Test-Retest Reliability of subscales and total of Urdu Version of Neuroception of Psychological Safety Scale – Generic Version (NPSS-G)

Scales	Items no	Urdu version
Social Engagement	(1-14)	.721**
Compassion	(15-21)	.735**
Body Sensations	(22-29)	.578**
Total	(1-29)	.671**

Note. 1-week test-retest interval for Urdu version N = 50 (Urdu version), ** correlation is significant at .01 level

Internal Consistency: The Cronbach's alpha values for the responses given by the sample of 32 participants are displayed in Table 5. These estimates show that adapted version has significant alpha values.

Table 5
Cronbach's alpha of Urdu Version of Psychological Safety Scale - Generic Version (NPSS-G)

Scales	No of items	Cronbach Alpha
Social Engagement	14	.901
Compassion	7	.839
Body Sensations	8	.899
Total	29	.938

Note. N = 324

Temporal stability: The test-retest reliability estimates obtained from the sample of 50 participants who completed the NPSS-G first and then second time after the time duration of 1-week. Estimates of test re-test for adaptive Urdu version is shown in Table 4; these results support the temporal stability of Urdu version of NPSS-G.

Inter-scale correlations: Inter-scale correlations of adapted Urdu version of NPSS-G, showed correlation in moderate to high range as shown in Table 6. The correlation of sub scales of Social engagement. Compassion, and Bodily sensations showed high correlations with NPSS-G total scores as compared to inter correlations of among scales.

Table 6
Inter - scale Correlations for the Urdu Version of Neuroception of Psychological Safety Scale – Generic Version (NPSS-G)

Scales	Social Engagement	Compassion	Body sensations	NPSS-Total
Social Engagement	-	.658**	.612**	.929**
Compassion	.658**	-	.515**	.794**
Body Sensations	.612**	.515**	-	.818**
NPSS-Total	.929**	.794**	.818**	-

Note. N = 324

The current study aimed to translate, culturally adapt, and assess the reliability of the (NPSS-G) into Urdu for use in the Pakistani context. Findings from the cross-language validation indicate a high degree of equivalence between the Urdu and English versions, with item-level correlations ranging from .508 to .982. This reflects the linguistic and conceptual integrity of the translated scale. These results are consistent with previous studies validating the NPSS in other languages. For instance, the Italian adaptation by Poli and Miccoli (2024) demonstrated strong psychometric properties and supported the scale's international relevance. Other studies have also established the validity of the NPSS in diverse cultural contexts including Greek, Bosnian, and Dutch populations (Morton et al., 2021).

Test retest reliability was also established supporting temporal reliability of this scale; with time interval of one-week correlations for individual items ranging from .568 to .775, and a total scale correlation of .671. This bring into line with findings from a study by Cogan and colleagues in UK-this project focused on validation where the NPSS demonstrated adequate test-retest reliability among healthcare workers (Cogan et al., 2024).

Internal consistency was assessed by Cronbach's alpha, which showed values of .901 for the Social Engagement subscale, .839 for Compassion, .899 for Body Sensations, and .938 for the total scale. These values specify high internal consistency and are similar to those observed in previous NPSS validations, where alpha coefficients was more than .85 (Morton et al., 2021). Additionally, inter-scale correlations among the three subscales were moderate to high, ranging from .515 to .658, while their correlations with the total score were particularly strong (.794 to .929). This pattern reflects the theoretical interconnection among the three domains of psychological safety comprised of social, emotional, and physiological aspects which are all essential to Polyvagal theory (Porges, 2022).

The results of this study have several implications. The reliable Urdu version of the NPSS-G offers a valued assessment tool for assessment of psychological safety from a neurophysiological perspective for researchers and practitioners in Pakistan. This is mainly beneficial in clinical, educational, workplace and organizational settings where safety perception is crucial in stress management, emotional wellness, and interpersonal functioning. The adaptation and translation of this assessment tool is accessible to a broader population spectrum and also expedites culturally sensitive mental health research.

In defiance of the significant psychometric findings, the study has some limitations. Firstly, while the sample size was adequate for reliability analyses, the use of non-clinical community participants limits the generalizability of the findings to clinical populations or individuals with trauma histories. Secondly, although temporal reliability

was established over a one-week interval, future studies may explore longer intervals to confirm more constancy over time. Furthermore, construct validity and confirmatory factor analysis were not addressed in this stage and should be examined in upcoming researches to establish the scale's factorial structure within the Urdu-speaking population.

Conclusion

In conclusion, the Urdu version of the NPSS-G establishes significant cross-language validity, internal consistency, and test retest reliability. These findings assist its implication as a culturally adapted tool for assessing neuroception of psychological safety not only in Pakistan but also Urdu-speaking populations across globe. The availability of this scale opens new paths for further exploration in emotional regulation, trauma responses, and interpersonal functioning in culturally miscellaneous contexts, and shares its contribution in the achievement of broader goal of enhancing psychological safety and mental wellness in an individual in Pakistani context.

Recommendations

It is recommended that future research work in this domain should scrutinize the Urdu NPSS-G across diverse populations and regions of Pakistan to further validate its psychometric properties. Additionally, the scale can be applied in clinical, educational, and organizational settings to assess interventions aimed at enhancing psychological safety. Future studies could also explore its predictive validity and cross-cultural comparisons.

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