

INTERACCIONES

Journal of family, clinical and health psychology

// ISSN 2411-5940

e-ISSN 2413-4465

www.revistainteracciones.com



ORIGINAL ARTICLE

Preliminary Psychometric Properties of the Gratitude Questionnaire in Peruvian College Students: A Comparison of the GQ-6 and GQ-5

Andrei Franco-Jimenez ^{1*}¹ Universidad Nacional San Luis Gonzaga, Ica, Peru.* Correspondence: andrei.franco@unica.edu.pe

Received: November 30, 2025 | Revised: January 22, 2026 | Accepted: February 11, 2026 | Published Online: February 14, 2026.

CITE IT AS:

Franco-Jimenez, A. (2026). Preliminary Psychometric Properties of the Gratitude Questionnaire in Peruvian College Students: A Comparison of the GQ-6 and GQ-5. *Interacciones*, 12, e493. <https://doi.org/10.24016/2026.v12.493>

ABSTRACT

Introduction: Gratitude is associated with psychological well-being and reduced psychopathology; however, the widely used Gratitude Questionnaire-6 (GQ-6) has shown inconsistent psychometric performance across cultures, particularly due to Item 6. In Latin America, evidence suggests that the abbreviated GQ-5 performs better, but no validation study has been conducted in the Peruvian context.

Objective: This study examined the psychometric properties of the Gratitude Questionnaire-6 (GQ-6) and its revised version, the Gratitude Questionnaire-5 (GQ-5), in a sample of 444 Peruvian college students.

Method: Participants completed the Spanish version of the Gratitude Questionnaire adapted by Quezada Berumen et al. (2023), along with additional measures to assess convergent validity. We conducted Exploratory Graph Analysis (EGA) and confirmatory factor analysis (CFA) to evaluate the dimensional structure and model fit. We also assessed measurement invariance by sex and internal consistency.

Results: The GQ-6 demonstrated poor fit indices; therefore, we removed Item 6, and the remaining items constituted the GQ-5. The initial GQ-5 model still required modifications; correlating the error terms between Items 4 and 5 yielded a good fit ($\chi^2(4) = 8.762$, CFI = 0.998, RMSEA = 0.052, TLI = 0.995, SRMR = 0.018). The final GQ-5 model demonstrated acceptable internal consistency ($\omega = 0.73$) and measurement invariance across sex. It also showed good convergent validity, correlating positively with self-efficacy ($r = 0.31$), mindfulness ($r = 0.34$), and well-being ($r = 0.20$), and negatively with depression ($r = -0.26$).

Conclusion: This adaptation underscores the importance of cultural adjustments and supports the GQ-5 as a reliable tool for assessing gratitude among Peruvian students in research and clinical contexts.

Keywords: gratitude, psychometrics, students, factor analysis, surveys and questionnaires.

INTRODUCTION

Gratitude can be defined as the appreciation of what is valuable and meaningful to oneself; it reflects a general state of thankfulness or appreciation (Sansone & Sansone, 2010).

Research has shown that gratitude uniquely predicts psychological well-being beyond other personality traits, contributing to dimensions such as environmental mastery, positive rela-

tionships, and self-acceptance (Wood et al., 2009). Moreover, gratitude has been associated with higher subjective well-being and reduced psychopathological symptoms (Jans-Beken et al., 2018).

In recent decades, psychological research has increasingly focused on gratitude in clinical contexts. The demonstrated effectiveness of gratitude interventions in enhancing well-being

(Kirca et al., 2023), along with their accessibility and ease of implementation—ranging from verbal or written expressions of gratitude to simple reflective practices—make them valuable tools for promoting mental health (Diniz et al., 2023). Given these implications, accurate measurement of gratitude is important for both research and clinical practice, as it deepens our understanding of well-being and informs targeted intervention strategies (Youssef-Morgan et al., 2022).

The Gratitude Questionnaire-6 (GQ-6), developed by McCullough et al. (2002), is one of the most widely used instruments for measuring dispositional gratitude, originally conceptualized as a unidimensional construct. It comprises six items designed to capture the frequency and intensity of grateful feelings. Subsequent research has evaluated the factorial structure of the GQ-6 using confirmatory factor analysis in diverse cultural contexts. While several studies have replicated the proposed unidimensional structure, others have reported poor global fit indices, thereby questioning the adequacy of the original six-item model (Chen et al., 2009; Rey et al., 2018; Valdez et al., 2017; Hudecek et al., 2020).

Consistent problems have been reported with Item 6, “Long amounts of time can go by before I feel grateful to something or someone” (Hudecek et al., 2020; Valdez et al., 2017; Rey et al., 2018; Chen et al., 2009). To address these fit-related problems, researchers have removed this item, yielding a modified version such as the GQ-5, which has shown improved psychometric properties (Balgiu, 2020; Chen et al., 2009; Ling et al., 2021).

The GQ-5 has demonstrated acceptable internal consistency across different populations, with Cronbach's alpha ranging from 0.70 to 0.80 (Balgiu, 2020; Chen et al., 2009; Ling et al., 2021). It has also shown good convergent validity, correlating positively with life satisfaction and positive affect, and negatively with depression (Balgiu, 2020; Hudecek et al., 2020; Langer et al., 2016). These findings highlight the need to re-evaluate the factor structure of the GQ-6 across different cultural settings and to consider adopting the GQ-5 when appropriate.

Despite its extensive use, the GQ-5 and GQ-6 have not been psychometrically evaluated in the Peruvian context. Given cultural variations in the expression and experience of gratitude, validating these instruments in Peruvian populations is important to ensure their appropriateness and accuracy. Previous validations in Latin American countries, such as Chile (Langer et al., 2016), Mexico (Quezada Berumen et al., 2023), and Ecuador (Lima-Castro et al., 2019), provide a foundation but also highlight the need for country-specific assessments due to cultural nuances.

Beyond cultural differences, it is also important to consider potential gender variations in gratitude expression. Research indicates that women tend to report higher levels of optimism and gratitude (Yue et al., 2017), whereas men are less likely to experience and express gratitude (Kashdan et al., 2009). Assessing measurement invariance across gender ensures that the instrument provides valid and comparable results for both men and women, thereby strengthening the robustness of the findings.

This study aims to evaluate the psychometric properties of the GQ-5 and GQ-6 in a sample of Peruvian university students.

Assessing these measures in this context has important implications for both research and practice. A reliable and valid gratitude scale enables researchers and practitioners to develop targeted interventions to enhance well-being. Moreover, validating this instrument facilitates cross-cultural comparisons and strengthens its applicability across diverse populations. These adaptations highlight the need to ensure that psychological assessments are culturally relevant to maintain their accuracy and reliability (Chen et al., 2009; Hudecek et al., 2020; Ling et al., 2021).

METHODS

Design

The study follows an instrumental design to analyze the psychometric properties of a self-report instrument (Ato et al., 2013).

Participants

The sample consisted of 444 students from two private universities and one public university in the city of Ica. The questionnaires were completed virtually via Google Forms. The sample comprised 277 women (62.4%) and 167 men (37.6%), with ages ranging from 18 to 48 years ($M = 20.37$; $SD = 3.30$). Exclusion criteria included being at least 18 years old and completing all requested data. A non-probabilistic convenience sampling method was used, as individuals were selected based on the researcher's accessibility and study requirements (Kerlinger & Lee, 2002), consistent with the study's preliminary and exploratory nature.

Measures

Gratitude Questionnaire-6 (GQ-6): The GQ-6, developed by McCullough et al. (2002), is a self-report six-item scale that assesses individual differences in the tendency to experience gratitude in daily life. In the present study, we used the Spanish version adapted by Quezada Berumen et al. (2023). Responses range from 1 to 7 on a 7-point Likert-type scale (1 = strongly disagree; 7 = strongly agree). Example items include “I have so much in life to be thankful for” and “If I had to list everything that I felt grateful for, it would be a very long list.” In Latin American contexts, internal consistency of the GQ-6, as measured by Cronbach's alpha, has been reported as 0.75 in Chile (Langer et al., 2016), 0.84 in Ecuador (Lima-Castro et al., 2019), and 0.79 in Mexico (Quezada Berumen et al., 2023).

It is important to note that Item 6, “Long amounts of time can go by before I feel grateful to something or someone,” has been identified as problematic in previous studies (Hudecek et al., 2020; Valdez et al., 2017; Rey et al., 2018; Chen et al., 2009). Consequently, the GQ-5 is a modified version of the GQ-6 that excludes this item. In Chile, this five-item version demonstrated a Cronbach's alpha of 0.72, while in Ecuador it showed a reliability coefficient of 0.93 among adolescents and adults.

Patient Health Questionnaire-9 (PHQ-9): In this study, we used the PHQ-9 as a self-administered scale to assess depressive symptoms. The scale consists of nine items addressing depressive symptomatology experienced during the two weeks prior to administration. Items are rated on a Likert scale ranging

from 0 (not at all) to 3 (nearly every day). Example items include "Little interest or pleasure in doing things" and "Feeling down, depressed, or hopeless." The PHQ-9 has demonstrated adequate reliability in Peruvian samples, with a reported Cronbach's alpha of 0.87 (Villarreal-Zegarra et al., 2019). In the current study, Cronbach's alpha was 0.85.

General Self-Efficacy Scale (GSES): The GSES was used to assess beliefs about personal competence in effectively responding to various stressful situations (Baessler & Schwarzer, 1996). The GSES consists of 10 items with a unidimensional structure and response options ranging from 1 (incorrect) to 4 (exactly true). Example items include "I can always manage to solve difficult problems if I try hard enough" and "I am confident that I could deal efficiently with unexpected events." The GSES has shown good internal consistency, with a Cronbach's alpha of 0.81 in a Peruvian sample (Grimaldo et al., 2021). In the present study, Cronbach's alpha was 0.91, indicating excellent reliability.

Mindful Attention Awareness Scale (MAAS-5): We used the five-item brief version of the MAAS-5, as suggested in previous studies (Osman et al., 2016; van Dam et al., 2010). The MAAS-5 assesses attention to present-moment experiences through five items rated on a scale from 1 (almost always) to 6 (almost never). Higher scores indicate greater mindfulness. We used the Spanish translation by Caycho-Rodríguez et al. (2019a). The MAAS-5 is suitable for assessing mindfulness in populations without prior meditation experience. In a Peruvian college sample, the scale demonstrated good reliability, with an omega coefficient of 0.83 (Caycho-Rodríguez et al., 2019b). In the present study, Cronbach's alpha was 0.87, indicating strong reliability.

World Health Organization-Five Well-Being Index (WHO-5 WBI): We used the Spanish version of the WHO-5 WBI, developed by Simancas-Pallares et al. (2016), as a brief screening measure of well-being. It consists of five items (e.g., "I have felt cheerful and in good spirits") with four Likert-type response options (0 = never, 1 = sometimes, 2 = often, 3 = always). The total score is obtained by summing item scores, with 0 indicating the absence of well-being and 15 indicating high well-being. This scale has demonstrated adequate psychometric properties in a Peruvian sample, with good internal consistency ($\alpha = 0.85$) (Caycho-Rodríguez et al., 2020). In the present study, Cronbach's alpha was also 0.85.

Procedures

The instruments were administered virtually using Google Forms. Participants were students from one public university and two private universities in Ica, Peru, recruited through social media platforms. Informed consent was obtained online, with participants informed that participation was voluntary and anonymous. It was also specified that the data would be used exclusively for academic purposes. Completion of the questionnaire required approximately 10 to 15 minutes.

Data Analysis

The psychometric evaluation was conducted using R software version 4.1.2 (R Core Team, 2021) and the lavaan package (Rosseel et al., 2012). Given the ordinal nature of the data, we used polychoric correlations to estimate relationships among

items, yielding more accurate factor loadings in factor analysis (Pendergast et al., 2017).

We conducted confirmatory factor analysis (CFA) to assess the fit of the hypothesized factor structure using the weighted least squares mean and variance adjusted (WLSMV) estimator. We evaluated model fit using RMSEA, SRMR, CFI, and TLI. Acceptable fit was defined as $RMSEA \leq 0.07$, CFI and $TLI \geq 0.95$, and $SRMR \leq 0.08$ (Hair et al., 2010). We also reported the χ^2 statistic but did not emphasize it due to its sensitivity to sample size.

In parallel, we implemented Exploratory Graph Analysis (EGA) using the EGAnet package (Golino & Christensen, 2021) to assess dimensionality from a network psychometrics perspective. We estimated EGA using the Gaussian Graphical LASSO (GLASSO) method with EBIC model selection ($y = 0.5$) (Christensen & Golino, 2021) based on a polychoric correlation matrix. The optimal penalty parameter (λ) was selected from a grid of 100 values (ratio = 0.1). We conducted community detection using the Louvain algorithm (Blondel et al., 2008) and assessed unidimensionality by examining the number of detected communities. Additionally, we used the Total Entropy Fit Index (TEFI) to evaluate global model fit.

We calculated reliability using the omega coefficient (McDonald, 1999) as an alternative to Cronbach's alpha, addressing its limitations such as the assumption of tau-equivalence (Cho, 2016; Sijtsma, 2009).

To examine measurement invariance, we followed the procedures recommended by Wu and Estabrook (2016) and Svetina et al. (2020). We compared configural invariance and threshold invariance across gender groups using the WLSMV estimator. We evaluated invariance based on changes in $CFI < 0.010$ and $SRMR < 0.005$ (Chen, 2007).

We examined convergent validity using Pearson correlations between the GQ scores and the PHQ-9, GSES, MAAS-5, and WHO-5 WBI. Additionally, to assess the relationship between the GQ-6 and its shortened version (GQ-5), we applied a corrected Pearson correlation to account for spurious variance due to shared items (Levy, 1967).

Ethical Aspects

This study adhered to the ethical principles outlined by the American Psychological Association (2017). Before completing the survey, participants received an informed consent form stating that participation was voluntary, responses were anonymous, and data would be used exclusively for academic purposes. The protocol was approved by the Institutional Ethics Committee of the Universidad Nacional San Luis Gonzaga (CEI-UNICA No017). All participants were informed of the study and signed a consent form prior to participation.

RESULTS

We performed a polychoric correlation analysis on the instrument's items, as presented in Table 1. The results indicate that the correlations of Item 3, "When I look at the world, I do not see much to be grateful for," and Item 6, "Long amounts of time can go by before I feel grateful to something or someone," with the remaining items were all below .40. This suggests weak cor-

relations between these items and the rest of the instrument.

We conducted an Exploratory Graph Analysis (EGA) on both the six-item (GQ-6) and five-item (GQ-5) versions. Figure 1a displays the network structure of the GQ-6, whereas Figure 1b illustrates the GQ-5 version, which excludes Item 6. The GQ-5 yielded a clear, unidimensional network: all five items formed a single Louvain community, with a high edge density (0.900) and a TEFI of 0, indicating no competing community solutions. In contrast, the GQ-6 produced a two-community partition, a lower edge density (0.733), greater variability in edge weights (Min = -0.062), and a negative TEFI (-3.102). These results indicate reduced cohesion and suboptimal global fit. Together, these findings suggest that Item 6 introduces noise or structural inconsistency, thereby challenging the theoretical unidimensionality of the whole questionnaire.

Table 2 presents the results of the CFA. The original unidimensional GQ-6 model exhibited poor fit indices. These indices improved after removing Item 6, as suggested in previous literature, resulting in the revised GQ-5 model. However, the RMSEA remained high. Therefore, we correlated the error terms of Item 4, "I am grateful to a wide variety of people," and Item 5, "As I get older, I find myself more able to appreciate the people, events, and situations that have been part of my life history" (MI = 14.96). We freely estimated this parameter in the final model.

Figures 2a–2c present the tested models. Figure 2a illustrates the original GQ-6 model, Figure 2b depicts the GQ-5 model after removing Item 6, and Figure 2c shows the final GQ-5 model, which includes correlated error terms between Items 4 and 5. Across all models, Item 3 consistently exhibited low factor loadings. Internal consistency analysis using the omega coefficient indicated weak reliability for the GQ-6 ($\omega = .69$), acceptable reliability for the GQ-5 ($\omega = .76$), and slightly lower reliability for the final model with correlated error terms ($\omega = .73$).

We conducted a measurement invariance analysis of the final GQ-5 model, including correlated error terms, across two groups defined by sex, as presented in Table 3. Configural invariance was supported based on the fit indices. We then tested more restrictive levels of invariance, specifically equal thresholds and equal loadings and thresholds across sex. These analyses met the acceptable criteria for changes in CFI and SRMR (Chen, 2007).

Finally, we assessed convergent validity by examining the correlations of the GQ-5 and GQ-6 with other psychological measures, as presented in Table 4. These measures included the PHQ-9 for depression, the GSES for self-efficacy, the MAAS-5 for mindfulness, and the WHO-5 WBI for subjective well-being. The GQ-5 showed significant correlations with these measures, closely aligning with those of the GQ-6. A corrected Pearson correlation (Levy, 1967) indicated a strong association ($r = .70$) between the GQ-5 and GQ-6. Despite the GQ-6's previously poor fit indices, we included it in this analysis for comparison purposes.

DISCUSSION

The present study aimed to evaluate the psychometric properties of the GQ-5 and GQ-6 in a Peruvian sample, thereby contributing to the cross-cultural validation of this widely used instrument. The findings indicate that the GQ-5, derived from the GQ-6 by removing Item 6, demonstrates satisfactory psychometric properties. Furthermore, correlating the error terms between Items 4 and 5 improved the model fit, supporting the utility of the GQ-5 for assessing gratitude in the Peruvian context.

Consistent with previous studies across different cultures, Item 6, "Long amounts of time can go by before I feel grateful to something or someone," showed very low correlations with the other items, negatively affecting the overall model fit. Removing Item 6 significantly improved the fit indices, as reported by Hudecek et al. (2020), Valdez et al. (2017), and Balgiu (2020). This finding suggests that Item 6 may not adequately capture the gratitude construct across cultural contexts, possibly due to cultural nuances, differences in interpretation, or its reverse-scored format. In addition, Chen et al. (2009) proposed that undergraduate students' limited life experience may contribute to poor performance on Item 6. In contrast, Langer et al. (2016) found that the five-item version was more appropriate for younger populations.

In the final GQ-5 model, we correlated the error terms of Items 4 and 5. We made this decision because both items explicitly refer to appreciation of other people and share overlapping content, whereas the remaining items refer to gratitude in more general terms. Notably, Fung (2024) also correlated these error terms in his GQ-5 study, resulting in improved fit

Table 1. Descriptive statistics of the GQ-6 items

Items	Polychoric correlations of the items						M	SD	g1	g2	r_{i-t}	ω if item deleted
	1	2	3	4	5	6						
1	-						5.61	1.63	-1.45	1.52	0.56	0.55
2	0.75	-					5.28	1.52	-0.95	0.55	0.62	0.55
3	0.16	0.16	-				4.73	1.70	-0.45	-0.82	0.18	0.75
4	0.56	0.58	0.08	-			5.16	1.51	-0.91	0.49	0.49	0.61
5	0.61	0.56	0.17	0.61	-		5.52	1.49	-1.24	1.23	0.52	0.61
6	-0.08	0.01	0.34	-0.07	-0.13	-	3.90	1.59	0.13	-0.80	0.10	0.76

Note. M = mean; SD = standard deviation; g1 = skewness; g2 = kurtosis; r_{i-t} = corrected item–total correlation; ω = McDonald's omega.

indices. Allowing this residual correlation does not alter the unidimensional structure of the GQ-5 or compromise the scale's construct validity.

The network analysis provides additional evidence of the GQ-6's structural limitations. The EGA revealed a two-community solution for the six-item version, with Item 6 clustering separately alongside Item 3. This result is consistent with the CFA findings, which showed that Item 6 had poor fit and was a candidate for removal. Notably, Item 6 was nearly disconnected from the core gratitude cluster, and its strong association with Item 3 may explain the low factor loading and residual correlations observed for Item 3 in the CFA. In contrast, the reduced GQ-5 yielded a clear unidimensional structure, with all five items forming a single cohesive community and showing optimal global fit indices. Together, these findings support the exclusion of Item 6 and reinforce the structural integrity of the five-item model.

Item 3, "When I look at the world, I do not see much to be grateful for," exhibited a notably low factor loading in both the GQ-5 and GQ-6, likely due to its reverse-scored format. Reverse-worded items often introduce methodological challenges, such as increased cognitive load, which can lead to misunderstanding or acquiescence bias (Suárez-Alvarez et al., 2018). Similar issues with Item 3 have been reported in studies conducted in Chile (Langer et al., 2016), Mexico (Quezada Berumen, 2023), Romania (Balgiu, 2020), Taiwan (Chen et al., 2009), and among Chinese and American adolescents (Ling et al., 2021), where Item 3 consistently showed low factor loadings. This low loading indicates that Item 3 did not contribute substantially to the underlying gratitude construct in these samples. The consistency of this pattern across cultures highlights the potential limitations of reverse-scored items in the GQ-6. Future revisions of the questionnaire could consider rephrasing or removing reverse-scored items to improve clarity and factorial validity.

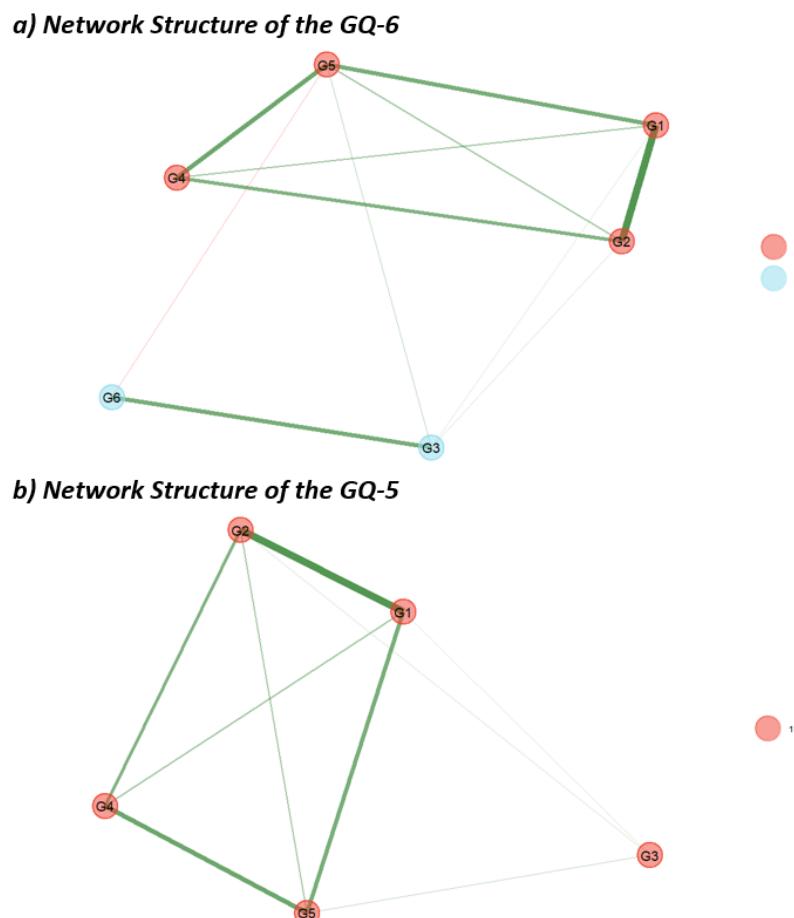


Figure 1. Exploratory Graph Analysis of the Gratitude Questionnaire: Comparison between GQ-6 and GQ-5 Structures.

Table 2. Fit Indices of Three One-Factor Models for the GQ-5 and GQ-6

Models	χ^2	df	CFI	TLI	RMSEA	SRMR
GQ-6	196.11	9	0.92	0.86	0.22	0.09
GQ-5	39.84	5	0.98	0.97	0.13	0.04
GQ-5 model with correlated errors terms between Items 4 and 5	8.76	4	0.10	0.10	0.05	0.02

The analyses indicate that the GQ-5 demonstrates measurement invariance between male and female participants. This finding is consistent with Balgiu (2020) and Rey et al. (2018), who also reported measurement invariance across sex. Establishing measurement invariance allows meaningful comparisons of gratitude levels between sexes in the Peruvian context. It supports the use of the GQ-5 in both male and female samples in cross-cultural research.

The internal consistency of the GQ-5, as indicated by McDon-

ald's omega, was acceptable and higher than that of the GQ-6. This result aligns with previous studies reporting strong internal consistency for the GQ-5 (Balgiu, 2020; Ling et al., 2021; Chen et al., 2009; Fung, 2024), further supporting its reliability in assessing gratitude. These findings suggest that, despite its small number of items, the GQ-5 provides a reliable measure of gratitude across diverse populations.

The GQ-5 also demonstrated good convergent validity, as indicated by a correlation of .34 with mindfulness. This associa-

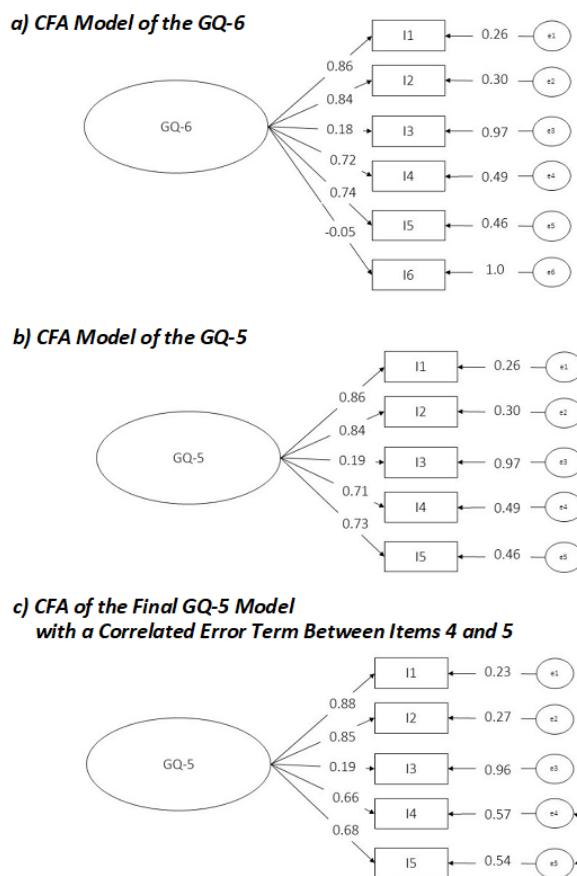


Figure 2. Comparison of Confirmatory Factor Analysis Models for the Gratitude Questionnaire.

Table 3. Measurement Invariance of the Final GQ-5 Model Across Sex.

Model invariance	$\chi^2(df)$	CFI	TLI	SRMR	ΔCFI	$\Delta SRMR$
Configural	26.254(8)	0.99	0.98	0.03	-	-
Equal thresholds	45.205(28)	0.99	1.00	0.03	0.00	0.00
Equal loadings and thresholds	38.745(32)	1.00	1.00	0.03	0.00	0.00

Tabla 4. Correlations of the GQ-5 and GQ-6 with Other Psychological Measures

Scale	GQ-5	GQ-6
PHQ-9	-0.26	-0.27
GSES	0.31	0.30
MAAS-5	0.34	0.35
WHO-5 WBI	0.20	0.21

tion is consistent with previous findings (Azad Marzabadi, Mills, & Valikhani, 2021; Swickert et al., 2019) and supports the established relationship between these constructs. Mindful individuals are generally more aware of and engaged in their present experiences, which facilitates the recognition and appreciation of positive aspects of life and, in turn, promotes gratitude. Similarly, individuals with higher levels of gratitude may experience lower stress and fewer negative emotions, thereby fostering a more mindful perspective (Azad Marzabadi et al., 2021). In addition, we found a correlation of .31 between gratitude and self-efficacy, indicating a meaningful association between these constructs. This result is consistent with theoretical expectations, as both constructs are positively related to adaptive psychological functioning (Datu & Yuen, 2020; Cousin et al., 2020).

Furthermore, we observed a correlation of .20 between gratitude and subjective well-being, consistent with that reported by Kong et al. (2021). According to Alkozei et al. (2018), two mechanisms may account for this association. First, the cognitive framework proposes that gratitude enhances the positive interpretation and recall of experiences, thereby reducing negative thought patterns and promoting a healthier cognitive style. Second, the psychosocial framework suggests that gratitude strengthens interpersonal relationships and social support, thereby enhancing emotional and physical well-being.

Consistent with previous research, we found a negative correlation between gratitude and depression, comparable to the results reported by Langer et al. (2016) ($r = -.35$), Rey et al. (2018) ($r = -.47$), and Dixit and Sinha (2021) ($r = -.30$). Gratitude may enable individuals to reinterpret negative experiences more positively, thereby reducing depressive symptoms through increased resilience and personal growth. Moreover, gratitude enhances positive emotions such as joy and satisfaction, which may counteract the reduced positive affect commonly observed in depression (Lambert et al., 2012).

The findings of this study indicate that the GQ-5 has strong psychometric properties, supporting its use as a reliable measure of gratitude. This result is particularly relevant given the growing body of research demonstrating the effectiveness of gratitude interventions in improving well-being and reducing symptoms of depression and anxiety (Diniz et al., 2023; Kirca et al., 2023). A rigorously validated instrument supports both clinical practice and research by enabling accurate assessment of gratitude and its association with mental health outcomes.

Limitations

Despite its strengths, this study has several limitations. The sample may not fully reflect the diversity of the Peruvian population, limiting the generalizability of the findings. Future research should include larger, more diverse samples and employ longitudinal designs to examine the stability of the gratitude construct over time and across demographic groups.

Conclusion

Removing Item 6 from the GQ-6 improved the scale's factor structure and reliability, yielding the GQ-5, a version supported by the literature and demonstrating satisfactory psychometric properties in a Peruvian context. In addition, establishing

measurement invariance across sex enables meaningful comparisons between male and female participants. The scale also shows appropriate correlations with related psychological constructs, supporting its use in research and clinical practice. Overall, the GQ-5 represents a reliable instrument for assessing gratitude among Peruvian students in both research and clinical settings.

ORCID

Andrei Franco-Jimenez: <https://orcid.org/0000-0001-8648-834X>

AUTHORS' CONTRIBUTION

Andrei Franco-Jimenez: Conceptualization, Methodology, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Visualization.

FUNDING SOURCE

This study was self-funded by the author. No external financial support or institutional funding was received.

CONFLICT OF INTEREST

The author declares no conflicts of interest.

ACKNOWLEDGMENTS

Not applicable.

REVIEW PROCESS

This study has been reviewed by two external reviewers in double-blind mode. The editor in charge was David Villarreal-Zegarra. The review process is included as supplementary material 1.

DATA AVAILABILITY STATEMENT

The author declares that the data supporting this study are available from the author upon reasonable request.

DECLARATION OF THE USE OF GENERATIVE ARTIFICIAL INTELLIGENCE

ChatGPT was used exclusively for minor language polishing and wording refinement. The final version of the manuscript was entirely reviewed and approved by the author.

DISCLAIMER

The authors are responsible for all statements made in this article.

REFERENCES

- Alkozei, A., Smith, R., & Killgore, W. D. S. (2018). Gratitude and subjective well-being: A proposal of two causal frameworks. *Journal of Happiness Studies*, 19(5), 1519–1542. <https://doi.org/10.1007/s10902-017-9870-1>
- American Psychological Association. (2017). *Ethical principles of psychologists and code of conduct* (2002, amended effective June 1, 2010, and January 1, 2017). <https://www.apa.org/ethics/code/>
- Ato, M., López-García, J. J., & Benavente, A. (2013). Un sistema de clasificación de los diseños de investigación en psicología. *Anales de Psicología*, 29(3), 1038–1059. <https://doi.org/10.6018/analeps.29.3.178511>
- Azad Marzabadi, E., Mills, P. J., & Valikhani, A. (2021). Positive personality: Relationships among mindful and grateful personality traits with quality of life and health outcomes. *Current Psychology*, 40(3), 1448–1465. <https://doi.org/10.1007/s12144-018-0080-8>
- Baessler, J., & Schwarzer, R. (1996). Evaluación de la autoeficacia: Adaptación española de la Escala de Autoeficacia General [Measuring generalized

self-beliefs: Spanish adaptation of the General Self-Efficacy Scale]. *Ansiedad y Estrés*, 2(1), 1–8.

Balgiu, B. A. (2020). The reliability and the construct validity of the Gratitude Questionnaire (GQ-6) in a sample of Romanian undergraduates. *Journal of Educational Sciences and Psychology*, 10(1), 101–109.

Blondel, V. D., Guillaume, J.-L., Lambiotte, R., & Lefebvre, E. (2008). Fast unfolding of communities in large networks. *Journal of Statistical Mechanics: Theory and Experiment*, 2008(10), P10008. <https://doi.org/10.1088/1742-5468/2008/10/P10008>

Caycho-Rodríguez, T., García Cadena, C. H., Reyes-Bossio, M., Cabrera-Orosco, I., Oblitas Guadalupe, L. A., & Arias Gallego, W. L. (2019b). Evidencias psicométricas de una versión breve de la Mindful Awareness Attention Scale en estudiantes universitarios [Psychometric evidence of a brief version of the Mindful Awareness Attention Scale in college students]. *Revista Argentina de Ciencias del Comportamiento*, 11(3), 19–32. <https://doi.org/10.32348/1852.4206.v11.n3.24870>

Caycho-Rodríguez, T., Ventura-León, J., Azabache-Alvarado, K., Reyes-Bossio, M., & Cabrera-Orosco, I. (2020). Validez e invariancia factorial del Índice de Bienestar General (WHO-5 WBI) en universitarios peruanos. *Revista Ciencias de la Salud*, 18(3), 1–23. <https://doi.org/10.12804/revistas.urosario.edu.co/revsalud/a.9797>

Caycho-Rodríguez, T., Ventura-León, J., Martínez-Munive, R., & Barboza-Palomino, M. (2019a). Traducción y validez de contenido de una escala breve de mindfulness para adolescentes peruanos. *Enfermería Clínica*, 29(5), 308–312. <https://doi.org/10.1016/j.enfcli.2018.10.002>

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A Multidisciplinary Journal*, 14(3), 464–504. <https://doi.org/10.1080/10705510701301834>

Chen, L. H., Chen, M.-Y., Kee, Y. H., & Tsai, Y.-M. (2009). Validation of the Gratitude Questionnaire (GQ) in Taiwanese undergraduate students. *Journal of Happiness Studies*, 10(6), 655–664. <https://doi.org/10.1007/s10902-008-9112-7>

Christensen, A. P., & Golino, H. (2021). On the equivalency of factor and network loadings. *Behavior Research Methods*, 53(4), 1563–1580. <https://doi.org/10.3758/s13428-020-01500-6>

Cho, E. (2016). Making reliability reliable. *Organizational Research Methods*, 19(4), 651–682. <https://doi.org/10.1177/1094428116656239>

Cousin, L., Buck, H., Benítez, B., Mills, P., & Redwine, L. (2020). A structural equation model of gratitude, self-efficacy, and medication adherence in patients with stage B heart failure. *Journal of Cardiovascular Nursing*, 35(6), E18–E24. <https://doi.org/10.1097/JCN.0000000000000721>

Datu, J., & Yuen, M. (2020). Students' connectedness is linked to higher gratitude and self-efficacy outcomes. *Children and Youth Services Review*, 116, 105210. <https://doi.org/10.1016/j.childyouth.2020.105210>

Diniz, G., Korkes, L., Tristão, L. S., Pelegrini, R., Bellodi, P. L., & Bernardo, W. M. (2023). The effects of gratitude interventions: A systematic review and meta-analysis. *Einstein*, 21, eRW0371. <https://doi.org/10.31744/einstein-journal/2023RW0371>

Dixit, S. K., & Sinha, J. (2021). Adaptation and validation of the Gratitude Questionnaire (GQ-6) for the Indian context. *Current Psychology*. Advance online publication. <https://doi.org/10.1007/s12144-021-02143-2>

Fung, S.-F. (2024). Evaluating the psychometric properties of the Gratitude Questionnaire in a Chinese sample: Comparing the 6-item and 5-item versions. *Mindfulness*, 15(9), 2321–2329. <https://doi.org/10.1007/s12671-024-02433-3>

Golino, H., & Christensen, A. P. (2021). *EGAnet: Exploratory Graph Analysis – A framework for estimating the number of dimensions in multivariate data using network psychometrics* (R package version 1.2.4). <https://CRAN.R-project.org/package=EGAnet>

Grimaldo, M., Correa, J., & Calderón-De la Cruz, G. (2021). Evidencias psicométricas de la Escala de Autoeficacia General (EAG) en universitarios peruanos. *Ansiedad y Estrés*, 27, 132–139. <https://doi.org/10.5093/anyes2021a18>

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Pearson.

Hudecek, M. F. C., Blabst, N., Morgan, B., & Lermer, E. (2020). Measuring gratitude in Germany: Validation study of the German version of the Gratitude Questionnaire–Six Item Form (GQ-6-G) and the Multi-Component Gratitude Measure (MCGM-G). *Frontiers in Psychology*, 11, 590108. <https://doi.org/10.3389/fpsyg.2020.590108>

Jans-Beken, L., Lataster, J., Peels, D., Lechner, L., & Jacobs, N. (2018). Gratitude, psychopathology and subjective well-being: Results from a 7.5-month prospective general population study. *Journal of Happiness Studies*, 19(6), 1673–1689. <https://doi.org/10.1007/s10902-017-9893-7>

Kashdan, T. B., Mishra, A., Breen, W. E., & Froh, J. J. (2009). Gender differences in gratitude: Examining appraisals, narratives, the willingness to express emotions, and changes in psychological needs. *Journal of Personality*, 77(3), 691–730. <https://doi.org/10.1111/j.1467-6494.2009.00562.x>

Kerlinger, F. N., & Lee, H. B. (2002). *Investigación del comportamiento: Métodos de investigación en ciencias sociales*. McGraw-Hill Interamericana.

Kirca, A., Malouff, J. M., & Meynadier, J. (2023). The effect of expressed gratitude interventions on psychological well-being: A meta-analysis of randomised controlled studies. *International Journal of Applied Positive Psychology*, 8, 63–86. <https://doi.org/10.1007/s41042-023-00086-6>

Kong, F., Yang, K., Yan, W., & Li, X. (2021). How does trait gratitude relate to subjective well-being in Chinese adolescents? The mediating role of resilience and social support. *Journal of Happiness Studies*, 22(4), 1611–1622. <https://doi.org/10.1007/s10902-020-00286-w>

Lambert, N. M., Fincham, F. D., & Stillman, T. F. (2012). Gratitude and depressive symptoms: The role of positive reframing and positive emotion. *Cognition & Emotion*, 26(4), 615–633. <https://doi.org/10.1080/02699931.2011.595393>

Langer, Á., Ulloa, V., Aguilar-Parra, J. M., Araya-Veliz, C., & Brito, G. (2016). Validation of a Spanish translation of the Gratitude Questionnaire (GQ-6) with a Chilean sample of adults and high schoolers. *Health and Quality of Life Outcomes*, 14, 1–9. <https://doi.org/10.1186/s12955-016-0450-6>

Levy, P. (1967). The correction for spurious correlation in the evaluation of short-form tests. *Journal of Clinical Psychology*, 23(1), 84–86. [https://doi.org/10.1002/1097-4679\(196701\)23:1%3C84::AID-JCLP2270230123%3E3.0.CO;2-2](https://doi.org/10.1002/1097-4679(196701)23:1%3C84::AID-JCLP2270230123%3E3.0.CO;2-2)

Lima-Castro, S., Peña-Contreras, E., Aguilar-Sizer, M., Bueno-Pacheco, A., & Arias-Medina, P. (2019). Adaptación y validación del Cuestionario de Gratitud GQ-6 para el contexto ecuatoriano. *Avaliação Psicológica*, 18(2), 129–137. <https://doi.org/10.15689/ap.2019.1802.15689.03>

Ling, Y., Yang, Q., Zeng, Y., & Huebner, E. S. (2021). Assessing the measurement invariance of the Gratitude Questionnaire–5 in Chinese and American adolescents. *The Spanish Journal of Psychology*, 24, Article e17. <https://doi.org/10.1017/SJP.2021.19>

McCullough, M. E., Emmons, R. A., & Tsang, J.-A. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology*, 82(1), 112–127. <https://doi.org/10.1037/0022-3514.82.1.112>

McDonald, R. P. (1999). *Test theory: A unified treatment*. Lawrence Erlbaum Associates Publishers.

Osman, A., Lamis, D. A., Bagge, C. L., Freedenthal, S., & Barnes, S. M. (2016). The mindful attention awareness scale: Further examination of dimensionality, reliability, and concurrent validity estimates. *Journal of Personality Assessment*, 98(2), 189–199. <https://doi.org/10.1080/00223891.2015.1095761>

Pendergast, L. L., von der Embse, N., Kilgus, S. P., & Eklund, K. R. (2017). Measurement equivalence: A non-technical primer on categorical multi-group confirmatory factor analysis in school psychology. *Journal of School Psychology*, 60, 65–82. <https://doi.org/10.1016/j.jsp.2016.11.002>

Quezada Berumen, L. (2023). Estudio de validez y confiabilidad del Cuestionario de Gratitud-6 (GQ-6) en México. *Acta de Investigación Psicológica*, 13(1), 42–52. <https://doi.org/10.22201/fpsi.20074719e.2023.1.476>

R Core Team. (2021). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. <https://www.R-project.org/>

Rey, L., Sánchez-Álvarez, N., & Extremera, N. (2018). Spanish Gratitude Questionnaire: Psychometric properties in adolescents and relationships with negative and positive psychological outcomes. *Personality and Individual Differences*, 135, 173–175. <https://doi.org/10.1016/j.paid.2018.07.005>

Rosseel, Y. (2012). lavaan: An R package for structural equation modeling. *Journal of Statistical Software*, 48, 1–36. <https://doi.org/10.18637/JSS.v048.i02>

Sansone, R. A., & Sansone, L. A. (2010). Gratitude and well being: The benefits of appreciation. *Psychiatry (Edgmont)*, 7(11), 18–22.

Sijtsma, K. (2009). On the use, the misuse, and the very limited usefulness of Cronbach's alpha. *Psychometrika*, 74(1), 107–120. <https://doi.org/10.1007/s11336-008-9101-0>

Simancas-Pallares, M., Díaz-Cárdenes, S., Barbosa-Gómez, P., Buendía-Vergara, M., & Arévalo-Tovar, L. (2016). Propiedades psicométricas del Índice de Bienestar General-5 de la Organización Mundial de la Salud en pacientes parcialmente edéntulos. *Revista de la Facultad de Medicina*, 64(4), 701–705. <https://doi.org/10.15446/revfacmed.v64n4.52235>

Suárez-Álvarez, J., Pedrosa, I., Lozano, L. M., García-Cueto, E., Cuesta, M., & Muñiz, J. (2018). Using reversed items in Likert scales: A questionable practice. *Psicothema*, 30(2), 149–158. <https://doi.org/10.7334/psicothema2018.33>

Svetina, D., Rutkowski, L., & Rutkowski, D. (2020). Multiple-group invariance with categorical outcomes using updated guidelines: An illustration using Mplus and the lavaan/semTools packages. *Structural Equation Modeling*, 27(1), 111–130. <https://doi.org/10.1080/10705511.2019.1602776>

Swickert, R., Bailey, E., Hittner, J., Spector, A., & Brittaney, B. (2019). The mediational roles of gratitude and perceived support in explaining the relationship between mindfulness and mood. *Journal of Happiness Studies*, 20(3), 815–828. <https://doi.org/10.1007/s10902-017-9952-0>

Valdez, J. P., Yang, W., & Datu, J. A. (2017). Validation of the Gratitude Questionnaire in Filipino secondary school students. *The Spanish Journal of Psychology*, 20, e45. <https://doi.org/10.1017/sjp.2017.51>

Van Dam, N. T., Earleywine, M., & Borders, A. (2010). Measuring mindfulness? An item response theory analysis of the Mindful Attention Awareness Scale. *Personality and Individual Differences*, 49(7), 805–810. <https://doi.org/10.1016/j.paid.2010.07.020>

Villarreal-Zegarra, D., Copez-Lonzoy, A., Bernabé-Ortiz, A., Melendez-Torres, G. J., & Bazo-Alvarez, J. C. (2019). Valid group comparisons can be made with the Patient Health Questionnaire (PHQ-9): A measurement invariance study across groups by demographic characteristics. *PLOS ONE*, 14(9), e0221717. <https://doi.org/10.1371/journal.pone.0221717>

Wood, A., Joseph, S., & Maltby, J. (2009). Gratitude predicts psychological well-being above the Big Five facets. *Personality and Individual Differences*, 46(4), 443–447. <https://doi.org/10.1016/j.paid.2008.11.012>

Wu, H., & Estabrook, R. (2016). Identification of confirmatory factor analysis models of different levels of invariance for ordered categorical outcomes. *Psychometrika*, 81(4), 1014–1045. <https://doi.org/10.1007/s11336-016-9506-0>

Youssef-Morgan, C. M., van Zyl, L. E., & Ahrens, B. L. (2022). The Work Gratitude Scale: Development and evaluation of a multidimensional measure. *Frontiers in Psychology*, 12, 795328. <https://doi.org/10.3389/fpsyg.2021.795328>

Yue, X. D., Hiranandani, N. A., Jiang, F., Hou, Z., & Chen, X. (2017). Unpacking the gender differences on mental health: The effects of optimism and gratitude. *Psychological Reports*, 120(4), 639–649. <https://doi.org/10.1177/0033294117701136>