

**GRATITUDE QUESTIONNAIRE (GQ-6):  
EVIDENCE OF CONSTRUCT VALIDITY IN BRAZIL**

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**Abstract.** This paper aims to adapt the *Gratitude Questionnaire (GQ-6)* to Brazil, gathering evidence of its validity (factorial and criterion) and reliability. Two studies were carried out. Participants in Study 1 were 471 undergraduate students ( $M_{\text{age}} = 22.8$ ; 59.2% females), who answered the *GQ-6* and demographic questions. To conduct exploratory (EFA) and confirmatory (CFA) factorial analyses, respectively, this sample was split in two ( $n_1 = 226$ ;  $n_2 = 245$ ). The EFA (Hull method) indicated a one-dimensional solution ( $\alpha = 0.87$ ), which was corroborated by CFA (e.g., CFI = 0.99;  $\alpha = 0.72$ ). Participants in Study 2 were 515 undergraduate students ( $M_{\text{age}} = 23.1$ ; 56.6% females), who answered the previous instruments, the *12-item Purpose of Life Test*, and the *Multi-Attitude Suicide Tendency Scale*. Results corroborated the one-factor structure (e.g., CFI = 0.97;  $\alpha = 0.71$ ), showing evidence of criterion validity ( $p < .001$ ) of the *GQ-6* with meaning of life [*existential lack* ( $r = -.50$ ) and *personal achievement* ( $r = .52$ )] and attitudes towards life [*attraction to life* ( $r = .44$ ) and *repulsion by life* ( $r = -.49$ )]. In conclusion, the *GQ-6* showed evidence of validity (factorial and criterion) and reliability, justifying its use in Brazil.

**Keywords:** gratitude, scale, validity, reliability.

For several years psychological research concentrated its efforts on the understanding of pathologies and resolution of problems, neglecting the healthy aspects of individuals (Schrank, Brownell, Tylee, & Slade, 2014). However, as an attempt to fill this gap, a new perspective has emerged with the aim of exploring and understanding people's potentialities and virtues, namely Positive Psychology. Studies in this area have focused on topics such as hope, wisdom, optimism, happiness, and gratitude; aspects that lead to flourishing on an individual, interpersonal and social level, playing a direct role in the promotion of positive aspects of personality (Scorsolini-Comin, Fontaine, Koller, & Santos, 2013). Gratitude, in particular, that is the object of the present paper, has been found to contribute to the development of pro-social behaviours and strengthening of interpersonal relationships. According to Nezlek, Newman and Trash (2016), grateful people feel happier, such that they show greater motivation to make their lives more productive.

In recent years there has been an increasing number of studies investigating gratitude as well as its association with other personal and social variables. Although researchers have conceptualised gratitude in different ways, for example, as a moral virtue, a resource of personal strength, a moral affect, and an affective characteristic (Paludo & Koller, 2006), a more consensual definition considers gratitude as an affection, termed *disposition toward gratitude*. As such, gratitude can be defined as the general tendency to recognise the role of other people's benevolence in a person's own positive outcomes and achievements, allowing this person to respond to such benevolence with grateful emotion (McCullough, Emmons, & Tsang, 2002).

Gratitude represents a trait of higher order named as orientation for life, including the following subscales:-(a) individual affective experiences of gratitude; (b) appreciation of other people; (c) attention to the beauty of the other; (d) behaviors in expressing

gratitude; (e) positive focus on the current moment; (f) the awareness of the brevity of life; (g) positive social comparisons (Wood, Froh, & Geraghty, 2010). Although gratitude is a multifaceted construct, the life-orientation trait encompasses sub-dimensions, meaning that a grateful personality also involves all of these aspects; therefore, a person with high scores in gratitude will also experience all of these elements.

Wood, Maltby, Stewart, e Joseph (2008) concluded that gratitude can be conceived as a second-order personality trait, representing an orientation for life, after empirical tests using the *Gratitude Questionnaire* (McCullough et al., 2002), *The Multifactorial Appreciation Scale* (Adler & Fagley, 2005), and the *Multifactorial Gratitude, Appreciation, and Resentment Test* (GRAT; Watkins, Woodward, Stone, & Kolts, 2003). These authors found that the subscales were hierarchically organized representing a first and second order structure. Despite Wood et al. (2010) have developed their own definition of gratitude; they have concluded that their results confirm the common definition of gratitude as a life orientation approach.

Therefore, gratitude consists of a vital construct that improves well-being. To illustrate this statement, Emmons and Mishra (2011) proposed ten possible explanations for how gratitude can enhance well-being, as following: gratitude 1) provides coping skills for stressful situations; 2) decrease feelings of envy or resentment; 3) reduces commitment to materialistic objects; 4) increases the *positive self-evaluations*; 5) raises the recruitment of positive memories; 6) increases social relationships; 7) motivates behavior to benefit the other; 8) elevates spirituality and religiosity; 9) facilitates achievement of goals; and 10) promotes physical health. In addition, Watkins, Uher, and Pichinevskiy (2014) found that the process of how gratitude influences increased well-being occurs through the evocation of positive memories.

In Brazil, studies in this area mostly focused on understanding gratitude in the context of child development. For example, Freitas, Silveira and Pieta (2009) identified differences across age groups for gratitude positive experiences, indicating that children at age of five are able to recognize an act of the benefactor to the beneficiary. Giglio (2017), taking into account cognitive processes, verified that directing attention to specific situations generated a greater state of gratitude and, in turn, greater cognitive control of positive and negative emotions. Similar to patterns found in other countries these results converged to the understanding of gratitude as a positive experience in Brazil. On the other hand, the expression and correlates of gratitude in Brazilian adults is not clear, given that studies exploring this topic in Brazil is scarce. A potential explanation for this is the lack of reliable instruments to assess gratitude in this country. Therefore, counting with a suitable scale to evaluate gratitude in Brazil could help to expand the understanding of this construct among Brazilians.

Investigating disposition towards gratitude is important for the understanding of pro-social behaviours and personality traits, given that this variable helps to understand how people live and experience gratitude to achieve a more positive life orientation.

Researchers dedicated to the study of gratitude have expanded the methods and measures that are suitable to verify and assess gratitude (Langer, Ulloa, Parra, Véliz, & Brito, 2016). In fact, different instruments have been designed for the measurement of gratitude. For example, the *Gratitude Resentment and Appreciation scale (GRAT)*, 44 items; Watkins et al., 2003), the *Transpersonal Gratitude Scale (TGS)*, 16 items; Hlava, Elfers, & Offringa, 2014), *Cuestionario de Gritud (G-20)*, 20 items; Bernabé-Valero, García-Alandete, & Gallego-Pérez, 2014), and the *Escala de Gritud (EG)*, 18 items; Alarcón, 2014). Nevertheless, *Gratitude Questionnaire (QG-6)*, 6 items) is the most used

questionnaire for research purposes, counting with evidence of validity and internal consistency in several contexts (Kong, You, & Zhao, 2017; McCullough et al., 2002).

#### *Gratitude Questionnaire (GQ-6)*

McCullough et al. (2002) developed the *Gratitude Questionnaire (GQ-6)*, a self-report measure to assessing people's dispositions towards gratitude in their everyday life. The authors consider gratitude as an affective trait, named as *disposition toward gratitude*. Initially, they created 39 items (including both positive and negative items), composed of statements describing experiences and expressions of gratitude as well as daily appreciation of life, answered on a 7-point scale, Likert-type, ranging from 1 (Strongly disagree) to 7 (Strongly agree).

The items that compose the scale are clustered into four different facets that correspond to four elements of the disposition toward gratitude. The first facet was named *intensity* and refers to the intensity to which an individual feels grateful when experiencing a positive event. The second facet was named *frequency* and describes how often a person feels grateful, which might be elicited by the simplest favour or act of politeness. *Span* was the third facet of the disposition towards gratitude and describes the number of life circumstances that an individual feels grateful for in a given moment. Finally, the fourth facet, *density*, corresponds to the number of people to whom an individual feels grateful for a positive outcome in life (e.g., obtaining a good job, concluding a university course), such that someone with a higher disposition towards gratitude would probably shows a longer list, including parents, family and friends, for example.

The data collection was carried out with undergraduate students, exploring the data via exploratory (explained 27% of the total variance) and confirmatory [Goodness of fit Indexes,  $\chi^2(9, N = 235) = 30.34, p < .001, CFI = .95, \text{ and } SRMR = .04$ ] analyses. Based on their findings, the authors considered only the first six items that obtained the

greatest factor loadings on the first factor, each of them measuring one single aspect of gratitude (e.g., *I am grateful to many people; If I had to list everything I am grateful for, this would be a long list*). This measure presented evidence of suitable internal consistency ( $\alpha = .82$ ). Moreover, in a second study, the authors found gratitude to be positively ( $p < .05$ ) correlated with life satisfaction ( $r = .53$ ), *vitality* ( $r = .46$ ), *happiness* ( $r = .50$ ), *optimism* ( $r = .51$ ), and *hope* ( $r = .67$ ). On the other hand, gratitude correlated negatively ( $p < .05$ ) with anxiety ( $r = -.20$ ) and depression ( $r = -.30$ ).

There have been efforts to adapt this scale to different contexts Chen, Chen, Kee, & Tsai, 2009; Kong et al., 2017; Yuksel & Duran, 2012). For example, in Taiwan (Chen et al., 2009) and Turkey (Yuksel & Duran, 2012), it was identified a one-factor solution composed of five items with satisfactory Cronbach's alpha coefficients ( $\alpha = .80$  and  $0.77$ , respectively). In turn, Jans-Beken, Lataster, Leontjevas, and Jacobs (2015) verified in the Netherlands a factor structure composed of six items and acceptable internal consistency ( $\alpha = .75$ ), corroborating the findings of the original study. Finally, Langer et al. (2016) adapted the *GQ-6* to Chile observing a one-factor model composed of the six original items, showing good reliability ( $\alpha = .83$ ) and confirmed measurement invariance across gender.

As reported previously, gratitude is conceived as an important tool to enhance well-being levels (Lin & Yeh, 2014; Killen & Macaskill, 2015). In addition, this construct has been progressively studied in another research fields for interventions purposes to increase psychological adjustment (e.g., organizational environment; Meyers, Woerkom & Bakker, 2012), demonstrating the potential of gratitude as an intervention tool in positive psychology (Donaldson, Dollwet, & Rao, 2014). Therefore, the use of a reliable measure to evaluate gratitude in Brazil would enable other researches to identify its

correlates and its predictive power to other phenomenon (e.g., optimism, happiness, and well-being).

As a short measure, the GQ-6 is particularly useful for research purposes, especially when several variables are being evaluated, requiring the use of multiple measures.

Furthermore, this scale has shown adequate psychometric evidence in other contexts (Chen et al, 2009; Yuksel & Duran, 2012; Jans-Beken et al., 2015; Langer et al., 2016), which suggest a potential use for the GQ-6 to measure gratitude in Brazil. We decided to adapt the GQ-6 to Brazilian Portuguese because the measure was originally created in a western country, however, western samples are not representative of all human population and generalising its conclusions to non-western countries may be problematic (Henrich, Heine, & Norenzayan, 2010). As such, assuming that the GQ-6 is suitable to evaluate gratitude in Brazil without properly testing its parametric parameter in this country may lead to biased results. Thus, in this paper we aimed to validate the GQ-6 in Brazil, gathering evidence of its construct validity (factorial and criterion), and reliability to add to the current literature on gratitude (Chen et al, 2009; Yuksel & Duran, 2012; Jans-Beken et al., 2015; Langer et al., 2016), allowing, for example, cross-cultural comparisons.

In order to gather evidence of criterion validity, we also correlated the GQ-6 with purpose of life and suicidal ideation. As a well-being promoter, gratitude operates together with other variables, such as meaning of life, to improve healthy psychological adjustment and consequently, contributes to reduce elements that lead to psychological distress, such as anxiety, depression and suicidal ideation (Petrocchi & Couyoumdjian, 2016; Kleiman, Adams, Kashdan, & Riskind, 2013). Thus, in Brazil, it is expected that gratitude correlates positively with the purpose of life and negatively with Multi-Attitude Suicide Tendencies.



In addition, because men and women feel and express gratitude differently (Kashdan, Mishra, Breen, & Froh, 2009), we also tested for factorial invariance across gender to ensure that these gender differences do not affect the way that Brazilian men and women interpret the GQ-6. Therefore, establishing measurement invariance is necessary to make comparisons between men's and women's gratitude scores using the GQ-6 (Milfont & Fischer, 2010). To achieve these aims, two studies were carried out.

### **Study 1. GQ-6 in Brazil: Factorial Validity and Reliability**

This is a first attempt to adapt the *GQ-6* to the Brazilian context. Specifically, we aimed to test its factorial structure, testing the possibility of identifying a one-factor solution. Moreover, we also examined its corresponding reliability.

#### **Method**

##### *Participants*

471 undergraduate students participated in the study from six different Brazilian states, with a mean age of 22.8 years ( $DP = 7.59$ ; ranging from 18 to 59 years). Most of them were female (59.2%), single (81.5%), and reporting to be of a socioeconomic middle-class (56.1%). The majority reported they were undertaking courses in Psychology (27.2%), Law (7.2%), and Computer Sciences (6.2%), living in Goiânia, GO (25.1%), Teresina, PI (19.7%), and João Pessoa, PB (13.8%). This was a convenience sample, with participants consisting of people present in a classroom who decided to participate voluntarily.

##### *Instruments*

Participants completed an online questionnaire investigating their demographic characteristics (sex, age, educational level, marital status, social class, and city of residence) and the *Gratitude Questionnaire*. This measure was originally elaborated in

English (McCullough et al., 2002), composed of six items (e.g., *When I look at the world, I don't see much to be grateful for; I am grateful to a wide variety of people*), assessing the tendency to experience gratitude in everyday life. The responses were given as a 7-point scale, ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*). The Portuguese translation of the *GQ-6* was produced using the back-translation procedure, collaborating on this task with two Brazilian bilingual researchers. In order to verify the semantic validity of this instrument, a group composed of ten participants from the target population answered the questionnaire. We aimed to check if the instructions were sufficient, if the items were readable, and whether they could be answered according to the proposed response scale. Modifications were not necessary, resulting in the final version of this measure (Table 1).

#### *Procedure*

Participants took part in the present study by completing a questionnaire available in electronic format via the internet. The first page of the online survey contained information regarding the aim of the study and offered instructions on how to answer the questionnaire. All participants were informed that the study was voluntary, the research project having been approved by the Ethics Committee from a public university in Brazil (Process N° 0157/09, Healthy Sciences Centre). On average, the participation required 10 minutes to complete the questionnaire.

#### *Data Analysis*

Before the data was analysed, participants were randomly split into two samples. The first sample ( $n_1 = 226$ ) was used to carry out the exploratory factor analysis (EFA). The software Facto 9.2 (Lorenzo-Seva & Ferrando, 2013) was used to investigate the dimensionality of the *GQ-6* by applying the Hull method, Comparative Fit Index (CFI; Lorenzo-Seva, Timmerman, & Kiers, 2011), through a categorical AFE [*Unweighted*

*Least Squares* (ULS)], based on polychoric correlations. The internal consistency was checked by calculating Cronbach's alpha (Holgado-Tello, Chacón-Moscoso, Barbero-García, & Vila-Abad, 2010). The dimensionality of the *GQ-6* was verified using the statistical package Mokken (van der Ark, 2012). This analysis has its bases on TRI (Response Item Theory), aiming at testing the assumptions of monotonic homogeneity and double monotonicity (Mokken & Lewis, 1982), requiring the indexes of scalability and Loevinger's H (for the general factor and for each item) to present values higher than .30 and .80, respectively.

Using the second half of the sample ( $n_2 = 245$ ), the cross-validation of the exploratory model of the *GQ-6* was tested via confirmatory factor analysis (CFA). The data was analysed on the R program, using the package *Lavaan* (Rosseel, 2012) and estimating the correlations matrix via *Weighted Least Squares Mean and Variance-Adjusted* (WLSMV; Muthén & Muthén, 2014), implemented by polychoric correlations, assuming the data to be ordinal, because WLSMV is specifically designed for ordinal data (Li, 2015). To examine the model fit, the following indexes were considered:  $\chi^2/df$  (the ratio chi-square by degrees of freedom), *GFI* (*Goodness-of-Fit Index*) and *AGFI* (*Adjusted Goodness-of-Fit Index*), *CFI* (*Comparative Fit Index*), and *RMSEA* (*Root-Mean-Square Error of Approximation*). The fit of a model is defined according the following criteria (Hair, Black, Babin, Anderson, & Tatham, 2009; Tabachnick & Fidell, 2013):  $2 \leq \chi^2/df \leq 3$ ; *CFI*, *GFI*, and *AGFI*  $\geq .90$  (preferably above .95), and *RMSEA*  $\leq .08$  ( $CI_{90\%} \leq .10$ ) (Schreiber, Stage, King, Nora, & Barlow, 2006).

A multi-group confirmatory factor analysis was carried out with the *Semtools* package (Jorgensen et al., 2016). The factorial invariance of the *GQ-6* across gender was tested

for (1) configural invariance: assesses whether the factorial structure can be invariant across groups, (2) metric invariance: tests whether the loadings between observed items and latent variables are equal across groups, and (3) scalar invariance: assesses the equality of intercept terms (i.e., thresholds) across groups (Cheung & Rensvold, 2002).

Measurement invariance was verified by using the CFI and RMSEA difference tests:

$\Delta$ CFI and  $\Delta$ RMSEA must be equal or below 0.010 and 0.015, respectively (Chen, 2007).

## Results

In the first stage, the polychoric correlations matrix demonstrated to be appropriate for performing the ordinal exploratory factor analysis ULS ( $KMO = .81$  and Bartlett's Sphericity Test,  $\chi^2 (15) = 628.01, p < .001$ ). Regarding the dimensionality of the instrument (Hull method, CFI), the data suggests a one-factor solution that showed a  $GFI$  of .98. The only retained factor ( $eigenvalue = 3.31$ ) accounts for 59% of the total variance. The unidimensionality of this questionnaire was corroborated by the Mokken Scalability Analysis [ $H = .45$  and  $Rho = .80$ ;  $H$ s varied from .36 (Item 6) to .54 (Item 1)]. The corresponding structure of the  $GQ-6$  is presented in Table 1.

Table 1. Factor structure of the Gratitude Questionnaire (GQ-6)

	Items	Loadings	$h^2$
04	I am grateful to a wide variety of people.	.82*	.67
02	If I had to list everything that I felt grateful for, it would be a very long list.	.81*	.65
01	I have so much in life to be thankful for	.81*	.69
05	As I get older I find myself more able to appreciate the people, events, and situations that have been part of my life history.	.75*	.56
03	When I look at the world, I don't see much to be grateful for. (R)	.60*	.37
06	Long amounts of time can go by before I feel grateful to something or someone. (R)	.51*	.26
Number of items		6	
Explained variance (%)		59.0	

Eigenvalues	3.31
McDonald's $\Omega$	.87
Cronbach's $\alpha$	.87

*Note:* \* satisfactory factor loadings (i.e., greater than |.40|.) (R) = reversed scored items.  $h^2$  = communality.  $\alpha$  = Cronbach's alpha via polychoric correlations.

As shown in Table 1, for the observed one-factor solution, the results indicated satisfactory evidence of the construct (factorial) validity of the *GQ-6*. All six items presented loadings above .40 on the general factor of gratitude, ranging from .52 (Item 6. *Long amounts of time can go by before I feel grateful to something or someone*) to .88 (Item 4. *I am grateful to a wide variety of people*). Moreover, the internal consistency coefficient (Cronbach's  $\alpha$ ) was above .70.

A CFA was carried out using the second half of the sample ( $n_2 = 245$ ) with the aim of cross-validating the exploratory model previously found. The results of the CFA (WLSMV) demonstrated the following goodness-of-fit indexes:  $\chi^2(9) = 9.55, p > .05$ ,  $\chi^2/df = 1.06$ ,  $GFI = .99$ ,  $AGFI = .99$ ,  $CFI = .99$ , and  $RMSEA = .01$  (CI90% = .000-.075). Moreover, all the factor loadings (Lambda coefficients) were statistically different from zero ( $\lambda \neq 0; z > 1.96, p < .001$ ), ranging from .43 (Item 6. *Long amounts of time I can go by before I feel grateful to something or someone*) to .74 (Item 4. *I am grateful to a wide variety of people*) (Figure 1).

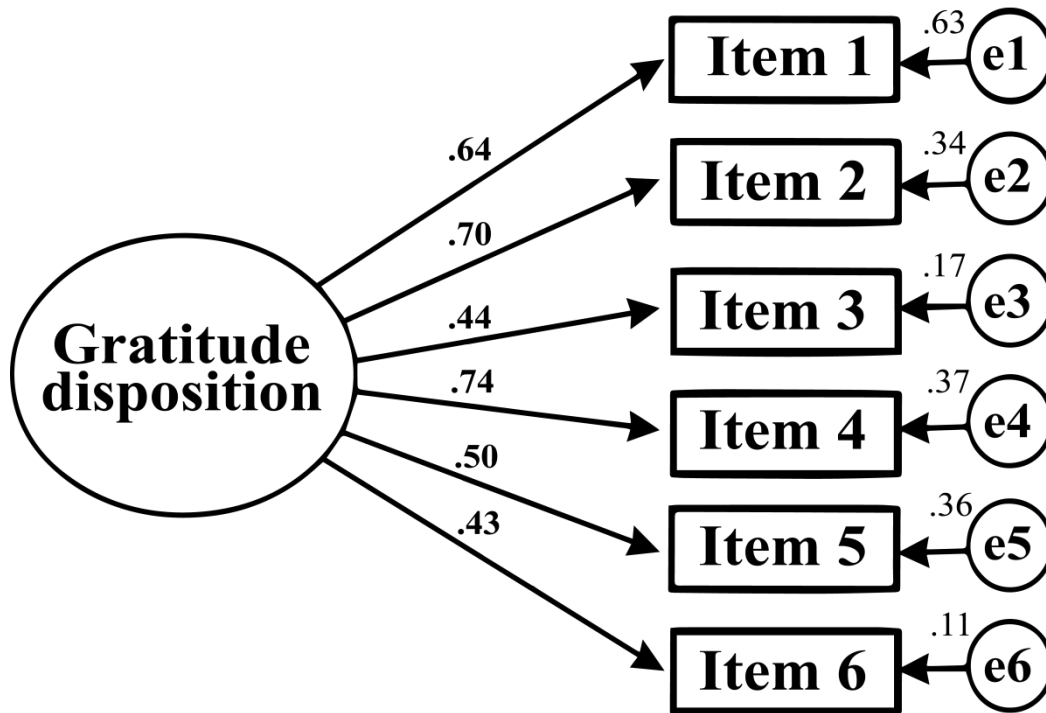


Figure 1. Factor structure of the Gratitude Questionnaire (GQ-6)

Moreover, we analysed factorial invariance by gender, using multigroup analysis. As shown in Table 02 measurement invariance for participants' gender was established only on the first level. As an alternative approach in cases that the measurement invariance is not established, we examined the modification indices (MI) to unconstrain (free) one or more items (Byrne, Shavelson, & Muthén, 1989). Effectively, the MI were too small to establish at least a partial metric invariance for the current model.

Table 02. Measurement invariance of the GQ-6 across gender

Models of Invariance	CFI	RMSEA	$\Delta$ CFI	$\Delta$ RMSEA
Configural	.907	.078	-	-
Metric	.815	.097	.092	.019
Scalar	.818	.087	.003	.010

Note.  $\Delta$  = differences between the current and the previous model.

In sum, these are the first findings regarding the GQ-6 in Brazil, showing evidence for one-factor structure, revealing adequate internal consistency. However, it is important to

replicate these results, as well as offering additional evidence of the psychometric appropriateness of this measure, as indicated in the following study.

### **Study 2. GQ-6 in Brazil: Criterion Validity and Reliability**

The current study attempted to replicate the one-factor structure of the *GQ-6* in an independent sample, in addition to gathering evidence of its criterion validity regarding measures focusing on the importance of life.

#### **Method**

##### *Participants*

Participants in this study consisted of 515 undergraduate students from six Brazilian states, showing a mean age of 23.1 years ( $DP = 6.57$ ; ranging from 16 to 56 years). They were mostly female (56.6%), single (82.5%), reporting to be of a socioeconomic middle-class (55.4%), studying Psychology (20.8%), Medicine (14.0%), and Computer Sciences (11.5%), living in Goiânia, GO (27.6%), João Pessoa, PB (20.6%), and Teresina, PI (17.5%). This was a convenience sample.

##### *Instruments and Procedure*

Participants completed an online questionnaire in the same conditions as in *Study 1*, including demographic questions (sex, age, educational level, marital status, social class, and city of residence), the *GQ-6*, and two new instruments assessing the importance of life:

*12-item Purpose of Life Test (PIL-12-Test)*. Developed by Harlow, Newcomb, and Bentler (1987), this instrument was adapted to Brazil by Aquino et al. (2009). It is composed of 12 items, distributed into two factors: *existential lack* (7 items,  $\alpha = .77$ ; e.g., *My personal existence is utterly meaningless without purpose*) and *personal achievement* (5 items,  $\alpha = .75$ ; e.g., *In life I have no goals or aims at all*). These items

were answered using a 7-point scale, ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*).

*Multi-Attitude Suicide Tendency Scale (MASTS)*. This scale was originally conceived by Osman, Barrios, Grittmann, and Osman (1993), comprising of 30 items, answered using a 5-point scale ranging from 1 (*Strongly disagree*) to 5 (*Strongly agree*), distributed into four factors of attitudes of suicidal tendency: *attraction to life*, *repulsion by life*, *attraction to death*, and *repulsion by death*. In the current study we used an adapted Brazilian version composed of 20 items, assessing the same factors (Aquino, 2009). However, taking into account the aims of this study, only two factors were considered: *attraction to life* (5 items,  $\alpha = .80$ ; e.g., *I enjoy many things in life*) and *repulsion by life* (5 items,  $\alpha = .76$ ; e.g., *I feel that I am not important to my family*).

## Results

Firstly, we carried out a confirmatory factor analysis (WLSMV), testing the appropriateness of the one-factor solution. The goodness of fit indexes supported this structure:  $\chi^2(9) = 24.06$ ,  $\chi^2/df = 2.67$ ,  $GFI = .99$ ,  $AGFI = .99$ ,  $CFI = .97$ ,  $TLI = .95$ ,  $SRMR = .06$ , and  $RMSEA = .05$  (CI90% = .030-.085). The internal consistency (Cronbach's alpha) of this gratitude dispositional factor was .71. Therefore, it seems clear the evidence of factorial validity and reliability of the *GQ-6*.

In addition to previous findings, we looked for observable evidence of the criterion validity of this questionnaire regarding two scales assessing the importance of life. We expected people higher in gratitude to be higher in meaning of life and to show a more positive attitude towards life. Our findings corroborated such predictions ( $p < .001$ ), indicating that gratitude scores were positively correlated with *personal achievement* ( $r = .52$ ) and *attraction to life* ( $r = .44$ ). Conversely, gratitude scores were negatively correlated with *existential lack* ( $r = -.50$ ) and *repulsion by life* ( $r = -.49$ ).



In sum, these findings corroborated those of *Study 1* regarding the construct validity (factorial validity and reliability) of the *GQ-6* in Brazil. Moreover, we offered evidence of its criterion validity with respect to factors assessing the importance of life for the respondents.

## **Discussion**

Empirical evidence has shown that people may become more resilient and healthier by frequently experiencing positive emotions (Algoe, Fredrickson, & Gable, 2013). In this regard, gratitude is one of the most powerful psychological constructs to increase well-being levels (Lin & Yeh, 2014), which, in turn, may function as a coping mechanism for mental health risk factors, such as depression and anxiety (Wood et al., 2008).

Nevertheless, studies focusing on the psychometric parameters of instruments designed to measure gratitude are still scarce, particularly in Brazil. To fill this gap, the current study aimed to investigate the psychometric parameters of the 6-item Gratitude Questionnaire (*GQ-6*; McCullough et al., 2002) in Brazil, gathering evidence of its factorial and content validity and internal consistency.

To evaluate the factor structure of the *GQ-6*, two independent studies were carried out. *Study 1* considered two subsamples. The first was used to carry out exploratory factor analysis ( $n_1$ ), observing results consistent with the original study by McCullough et al. (2002). The factorial solution found was composed of a single general factor, obtained by using the Hull method, a robust criterion for factor extraction (Damásio, 2012; Lorenzo-Seva et al., 2011). In addition, Mokken analysis, a non-parametric statistical tool (Van der Ark, 2012), useful to test the unidimensionality of a scale (Stochl, Jones, & Croudace, 2012), corroborated the original structure of the *GQ-6*. Regarding the internal consistency, the coefficient found was satisfactory ( $\alpha > .70$ ; Cohen, Swerdlik, & Sturman, 2014). Next, a confirmatory factor analysis ( $n_2$ ) was carried out, corroborating

the one-factor solution with adequate goodness of fit indexes (Hair et al. 2009; Tabachnick, & Fidell, 2013), presenting acceptable index of reliability.

We also tested for factorial invariance by gender. The importance of examining this parameter is due to differences between men's and women's expression and feelings of gratitude (Kashadan et al., 2009) that may lead to disparities between men's and women's understating of the GQ-6 items. As previously reported, the measurement invariance was established only for the configural level, indicating that the general factor structure of the GQ-6 is the same across different groups. Therefore, at this level, the construct is measured by the same set of indicators in both men and women.

The metric and scalar invariance, however, were not established, meaning that men and women understand the items of the GQ-6 differently. As such, cross-gender comparisons using this scale in Brazil may not be meaningful (Davidov, Meuleman, Cieciuch, Schmidt, & Billiet, 2014). However, further studies are necessary to investigate whether this is specific to our sample or whether these results would also be replicated in different Brazilian participants. Perhaps, the content of the items may have caused noise in the stability of the metric variance. For example, item six (*Long amounts of time can go by before I feel grateful to something or someone*) refers to the how long a person takes to manifest gratitude towards something or someone. However, it is observed that the expression of gratitude after longer periods occurs more in females when compared to males (Kashadan et al., 2009).

*Study 2* replicated the results of *Study 1* via confirmatory factor analysis, confirming the one-factor structure of the GQ-6 in Brazil. Goodness of fit indexes were in line with the recommended in the literature (Tabachnick & Fidell, 2013). In addition, we also provided evidence for criterion validity of the GQ-6, considering two instruments assessing factors describing appreciation and importance attributed to life. In line with

the theoretical framework, grateful people are more alive, (i.e. they find life more meaningful), have a higher desire to live their lives fully and tend to find more reasons to live for. As a result, experience of gratitude is negatively correlated with lack of meaning in life or repulsion by life (Krysinska, Lester, Lyke, & Corveleyn, 2015). Because our findings were similar to previous studies in the literature using different measures of gratitude, we can assume that the GQ-6 is a useful tool to identify correlates and predictors of gratitude in Brazil.

The current paper contributes to the study of gratitude, a topic that psychologists have neglected for many years, even in the international scenario (Emmons & Crumpler, 2000; McCullough, Kilpatrick, Emmons, & Larson, 2001). In Brazil, this is the first attempt to measure gratitude using a brief questionnaire with adequate psychometric parameters. However, it is necessary to point out a few potential limitations. Firstly, because the samples used in this study are non-probabilistic and limited to undergraduate students, the generalisability of these results beyond the present sample is limited. Secondly, the usage of self-report measures may be problematic, given that participants may falsify their responses, which may also have affected the present findings. Thirdly, as the study was conducted online, completion of the survey was limited to those people that have internet access. Thus, further studies are still required, considering, for example, participants of the general populations and clinical patients. Additionally, the literature has shown that older and more educated people are more grateful for their lives (Chopik, Newton, Ryan, Kashdan, & Jarden, 2017; Jans-Beken et al., 2015). As such, studies that include people of different age groups are necessary to increase the generality of the findings.

Another limitation of the present study was the lack of testing for other types of validity (e.g. discriminant, concurrent). Therefore, future studies could collect additional data in

order to provide further evidence for the suitability of the GQ-6 in Brazil. For instance, to check evidence of its discriminant (e.g., to social desirability), convergent (e.g., factor agreeableness and extraversion composed the Big Five), predictive (e.g., well-being), and concurrent (e.g., depression, anxiety) validities. Another important aspect to be investigated is the nature of gratitude as a dispositional trait (McCullough et al., 2002) or a psychological state (Watkins, van Gelder, & Frias, 2009). These studies would expand the findings observed in the present paper, as well as corroborate the impact of gratitude on healthy psychological functioning in the Brazilian context. Finally, it is important to note that gratitude contributes to the understanding of subjective well-being and has the potential to expand studies on personality. Therefore, adapting a measure of gratitude may help to expand the literature in positive psychology in Brazil. The main contributions of adapting the GQ-6 to the Brazilian context are related to the replication of results of its psychometric properties converging to findings from other contexts, considering intercultural data. Thus, the transcultural adaptation can be useful for researchers interested in understanding the theoretical elements intrinsic to gratitude.

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