RESEARCH PAPER

Validation of the Gratitude Questionnaire (GQ) in Taiwanese Undergraduate Students

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Abstract The aim of this study was to translate and validate the Gratitude Questionnaire (GQ; McCullough et al. 2002) using Taiwanese undergraduate students. A total of 608 college students (M_{age} = 20.19, SD = 2.08) were recruited for the current study and they completed the GQ, optimism, happiness, and big five personality questionnaires. Confirmation factor analysis indicated that a five item model was a better fit than the original six item model. Cross-validation also supported the modified Chinese version of the GQ. In addition, the Chinese version of the GQ was, as expected, positively correlated with optimism, happiness, agreeableness, and extraversion, which supported its construct validity. The Cronbach's α was .80 for the Chinese version of the GQ, indicating satisfactory validity and reliability in a Taiwanese student sample. It was concluded that the Chinese version of the GQ would be useful for assessing individual differences in dispositional gratitude.

Keywords Grateful · Positive psychology · Well-being

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1 Introduction

Psychological issues related to anxiety, depression, fear, hostility, substance abuse, and traumatic experiences have received extensive attention (Fredrickson 1998; Seligman and Csikszentmihalyi 2000). Of late, the heavy research focus on the negative aspects of psychology has been criticized (Fredrickson 2001; Snyder and Lopez 2002). Research that emphasizes the treatment and prevention of pathological issues focuses on people's suffering experience rather than cogitating people's well-being as the first priority (Fredrickson 2000). To promote a more proactive approach to understanding people, some researchers directed their effort to examining positive psychological constructs such as resilience (Yorgason et al. 2007), mindfulness (Kee and Wang 2008), humor (Olson et al. 2005), passion (Vallerand et al. 2008), and positive affectivity (Watson 2002). In this article, we direct our attention to one important positive affective trait: gratitude, which is only beginning to receive attention in the scientific community (McCullough et al. 2001). Specifically, we present a report on the validation of an inventory (gratitude questionnaire; GQ, McCullough et al. 2002) that purports to measure dispositional gratitude based on data from a non-western sample.

McCullough et al. (2002) developed the 6-item GQ to assess individual differences in dispositional gratitude. Their work opened a new avenue for understanding the positive effect that gratitude has on well-being (e.g., Chen and Kee in press; Wood et al. 2008). Gratitude is defined as an affective trait that is a "general tendency to recognize and respond with grateful emotion to the roles of other people's benevolence in the positive experiences and outcomes that one obtains" (McCullough et al. 2002, p. 112). Based on their definition, gratitude is considered a moral barometer that is sensitive to the benefits or help received from another moral agent, especially when the cost is high for the benefactor. McCullough et al. (2001) suggested that people who experienced grateful mood or emotion were more likely to behave prosocially to the benefactor or a third party. Moreover, gratitude served as a moral reinforcement underlying reciprocal altruism. In other words, by saying "thank you," the beneficiary confirmed the benefactor's benevolence and increased the likelihood of receiving support from the benefactor in the future. The researchers pointed out that reciprocal altruism would accumulate, becoming a social resource that can be drawn upon if people encounter adversity in the future. Therefore, it is important to understand gratitude because it cultivates social resources and, thus, enhances people's well-being (Fredrickson 2004; McCullough et al. 2002).

The three aspects of the moral foundation of gratitude that involve social interaction do not seem to be culturally specific. For example, one of the old Chinese proverbs states "to knot grass and carry a ring" (銜草結環以報), which means to repay someone for a kindness once the beneficiary has the opportunity to do so. Also, the traditional Chinese religion fairly respects the immaterial power of spirits and ancestors, which leads culturally Chinese people to believe that the millennial life comes from the grace of spirits and ancestors; therefore, people often express their gratitude through religious rites (Yang et al. 2005). By doing so, people feel comfortable and well-being may be increased (Wang and Sun 2005). It is easy to observe that the sources of gratitude in the East may be somewhat similar to those of the West because they are not only limited to the human agent, but also include God or a higher power.

For the assessment of gratitude, McCullough et al. (2002) conducted four studies based on undergraduate students and adults to examine the validity of the GQ. Confirmatory factor analyses show that a robust one-factor structure with satisfactory internal consistency exists across studies. McCullough and colleagues also report that the GQ was

positively related to positive affect, well-being, prosocial behavior, and religiousness/spirituality (study 1 and study 2) and negatively correlated with envy and materialistic attitudes (study 3). Furthermore, the association between the GQ and related variables was robust after controlling for Extraversion/positive affectivity, Neuroticism/negative affectivity, and Agreeableness (study 4). Their results suggested that the GQ possesses good psychometric properties and is a distinctive construct.

Subsequently, other researchers in western countries conducted several studies based on the GQ to investigate the relationship between gratitude and well-being. These studies largely show that a positive relation between gratitude and well-being exists. For example, Wood et al. (2007) found that highly grateful undergraduate students reported lower stress and depression but higher happiness as well as satisfaction with life. Furthermore, they found that coping style partially mediated the relationship between gratitude and stress. In another study, Kashdan et al. (2006) investigated the association between gratitude and hedonic as well as eudaimonic well-being indicators in Vietnam war veterans with post-traumatic stress disorder (PTSD). They found that gratitude predicted greater affect balance, rewarding social activity, intrinsically motivating activity, and self-esteem in veterans with PTSD. Taken together, these results not only suggest that gratitude plays an important role in determining well-being, but also show that the GQ is a reliable and valid tool for measuring gratitude.

Research in a non-western sample that utilizes the GQ was first undertaken by Chen and Kee (in press). After translating the GQ items into Chinese, they used the GQ to examine gratitude and Taiwanese athletes' well-being indicators. They found that athletes with higher dispositional gratitude had greater team satisfaction and life satisfaction as well as lower athlete burnout. Chen and Kee's (in press) research provided the first documentation of the positive role of gratitude using the GQ items. However, at least two issues remain to be tackled since scale validation is a continual process. First, the psychometric properties of the GQ were not examined in Chen and Kee's (in press) study. This might diminish the utility of the GQ. Did the GQ maintain similar factor structure after its translation into Chinese? Further, does the GQ possess satisfactory factorial validity? These questions were not answered in the previous study. Second, the researchers administered the Chinese GQ in a very specific sample; namely, adolescent athletes. The question thus remains whether the Chinese GQ can be applied to other more general samples such as undergraduate students.

Further examination of the validity and reliability of the Chinese GQ will make important contributions to the literature. A psychometrically sound measure of the Chinese GQ would be an important tool for conducting empirical study on the Chinese-speaking population. McCullough et al. (2001) indicated that gratitude is the parent of virtues that motivates people to be prosocial and also enhances well-being. As the traditional Chinese culture and religion (Yang et al. 2005) emphasized gratitude as an important virtue (Xin 2006), it is important for the international community to understand the cross-cultural effects associated with gratitude. In doing so, a more complete picture of gratitude as a human strength can be painted, as most published studies today are based on western samples (e.g., McCullough et al. 2002; Wood et al. 2008a, c). Thus, the purpose of this study was to investigative the validity and cross-validity of the GQ with a sample of Chinese individuals in Taiwan. The confirmatory factor analysis was conducted to test the underlying structure of the items. Also, correlation analyses were conducted to examine whether the Chinese GQ has hypothetical relationships with happiness, optimism, agreeableness, neuroticism, and extraversion. These five constructs were selected because of their reliable relationship with gratitude (McCullough et al. 2002, 2004; Neto 2007; Wood

et al. 2008a, b, c; Wood et al. 2007). It is suggested that grateful people experience greater happiness because they appreciate life as a gift when they compare themselves to someone who lives in a difficult position. The relationships among gratitude, optimism, agreeableness, and extraversion are expected to be positive while neuroticism is expected to be negative as they share the same variance of emotional experience rooted in personality (McCullough et al. 2002).

2 Method

2.1 Participants and Procedure

A total of 608 college students ($M_{age} = 20.19$, SD = 2.08) recruited from Central Taiwan University of Science and Technology, National Taichung Institute of Technology, and Soochow University in Taiwan were targeted for the study. Four hundred twenty-seven of the participants were females and 181 participants were males. A multi-section questionnaire was administered to the participants in a quiet classroom setting. One of authors was present to answer any queries raised by the participants. The participants took about 30 min to complete the entire set of questionnaires. Participants' involvement in this study was voluntary and their confidentiality as well as anonymity was ensured as the participants were assigned and identified by a unique code known only to the investigators.

2.2 Measurement

2.2.1 Dispositional Gratitude

The GQ developed by McCullough et al. (2002) was used to measure disposition toward gratitude. They demonstrated that the GQ is a psychometrically sound measure across four studies. Previous studies utilizing the English version GQ-6 also found that the instrument possesses good psychometric properties (e.g., Giacalone et al. 2005; Kashdan et al. 2006; McCullough et al. 2004; Watkins et al. 2006). The translation of the GQ was originally conducted by a doctoral student majoring in psychology who had mastered both Chinese and English. After the GQ was translated into Chinese, a second bilingual translator (both English and Chinese) back translated the items into English. Both Chinese and English items were also evaluated by the authors to ensure equivalence in meaning and comparability. Chen and Kee (in press) reported that the Cronbach's α of the Chinese GQ was .80 in a sample of athletes. The Chinese GQ was positively related to life satisfaction and team satisfaction, while negatively correlated with athlete burnout. The results supported the preliminary reliability and validity of the Chinese GQ. In the current study, participants indicated their responses on a 7-point Likert scale with responses ranging from strongly disagree (1) to strongly agree (7).

2.2.2 Subjective Happiness

A short version of subjective happiness was used because of its relatedness (along with happiness and optimism) to gratitude (as mentioned earlier). The status of participants was assessed by one item (e.g., On the whole, do you feel that you are having a happy life now?) that was obtained from the Taiwan Social Change Survey (TSCS), which was

supported by the National Science Council of Taiwan. Previous studies in Taiwan indicated that this item was significantly related to marital status (Lee 2007) and income (Chiu 2004). Participants indicated their response to this question on a 6-point Likert scale with responses ranging from strongly disagree (1) to strongly agree (6).

2.2.3 Optimism

The Life Orientation Test-Revised (LOT-R, Scheier et al. 1994) consists of 10 items (4 of which are filler items) used to assess individual differences in generalized optimism (3 items) versus pessimism (3 items). Previous studies indicated that the LOT-R is reliable and valid in the Chinese-speaking population (Lai and Yue 2000; Lai et al. 1998). Given our research interest in the relationship between optimism and gratitude, only the optimism items were used for this study. Items were evaluated using a 6-point Likert scale.

2.2.4 Big Five Personality

The Chinese Big Five personality scale was developed by Chuang and Lee (2001). Based on the fundamental lexical hypothesis (Goldberg 1990), they collected 148 Chinese adjectives, formed a scale, and administrated it to teachers of elementary school students. Factor analysis from teachers' ratings of students indicated that these adjectives could be clustered into five categories that correspond to the Big Five model. The Chinese Big Five personality questionnaire is also reported to have satisfactory internal consistency (Cronbach's α ranged from .78 to .94) as well as having a 1-year test and retest reliability (Chuang and Lee 2001). Chen (2004) modified the Chinese Big Five personality scale into a shorter version and administered it to a teacher sample. Factor analysis indicated that the short version of the Chinese Big Five personality scale maintained the five factor structure and produced acceptable reliability (Cronbach's α ranged from .60 to .86). Based on our research interest and for sake of brevity, the short version of extraversion (5 items), neuroticism (3 items), and conscientiousness (5 items) was used. Participants indicated their response on a 6-point Likert scale.

2.3 Data Analysis

To ascertain that the model fit was not due to an idiosyncratic sample, we randomly divided the participants into two equal samples using SPSS 13.0. Cohort 1 data was used to find a best fitting model that consisted of 93 males and 211 females ($M_{age} = 20.27$, SD = 2.02) and the Cohort 2 data was used for cross-validation. Cohort 2 was composed of 88 males and 216 females ($M_{age} = 20.11$, SD = 2.14). The ratio of sample size to number of free parameters was 50:1, which is above the recommended 10:1 (Bentler and Chou 1987). The confirmatory factor analysis was conducted using LISREL 8.72 and the Maximum Likelihood (ML) estimation was chosen because each dataset met the criterion whereby no variable was skewed greater than 2 and no variable had a kurtosis value greater than 7 (West et al. 1995). Overall model fit was assessed according to Hu and Bentler's (1999) recommendation, including standardized root mean square residual (SRMR), non-normal fit index (NNFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). In addition, Pearson's correlation was also conducted to examine the relationship between gratitude and theoretically related criteria.

3 Result

The mean and standardized deviation of each item is presented in Table 1 for Cohort 1 and Cohort 2 data. We used the Cohort 1 data to conduct the first confirmatory factor analysis to evaluate the factorial validity of the Chinese GQ. Results demonstrated relatively poor fit ($\chi^2(9) = 49.46$, $p < .001$, RMSEA = .12, NNFI = .90, CFI = .94, SRMR = .07). All parameters were significant at $p < .001$ except for item 6: "long amounts of time can go by before I feel grateful to something or someone" (standardized factor loading = .01, ns). Given that a non-significant parameter might result in a poor fit, item 6 was eliminated and a second confirmatory factor analysis was conducted. Results based on the remaining five items of the Chinese GQ indicated an adequate fit ($\chi^2(5) = 15.26$, $p < .001$, RMSEA = .08, NNFI = .97, CFI = .99, SRMR = .03), which was an improvement over the six items model. The factor loadings ranged from .34 to .85.

Cohort 2 data were used for model cross-validation. The results also indicated that the one-factor model with five items of the Chinese GQ has adequate fit ($\chi^2(5) = 12.34$, $p < .05$, RMSEA = .07, NNFI = .98, CFI = .99, SRMR = .02) and the factor loadings

Table 1 Descriptive statistics of each item of the GQ

	Cohort 1		Cohort 2	
	M	SD	M	SD
1. I have so much in life to be thankful for	5.92	1.29	5.88	1.37
2. If I had to list everything that I felt grateful for, it would be a very long list	5.51	1.40	5.43	1.49
3. When I look at the world, I don't see much to be grateful for	2.34	1.69	2.39	1.66
4. I am grateful to a wide variety of people	5.62	1.28	5.58	1.30
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	5.98	1.25	5.97	1.26
6. Long amounts of time can go by before I feel grateful to something or someone	4.20	1.72	4.12	1.72

Note: Item 3 and 6 are reverse scored

Table 2 Result of confirmatory factor analysis

	Cohort 1 Standardized estimates	Cohort 2 Standardized estimates
1. I have so much in life to be thankful for	.85 (.28)	.81 (.34)
2. If I had to list everything that I felt grateful for, it would be a very long list	.78 (.40)	.71 (.50)
3. When I look at the world, I don't see much to be grateful for	.34 (.88)	.36 (.87)
4. I am grateful to a wide variety of people	.73 (.47)	.84 (.29)
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	.68 (.54)	.81 (.34)

Note: All estimates were significant at $p < .001$; values in parentheses are errors for estimates

Table 3 Correlation among variables

	M	SD	N	α	1	2	3	4	5	6
1. Gratitude	5.71	1.05	608	.80	1.00					
2. Happiness	4.31	1.13	606	—	.31***	1.00				
3. Optimism	4.00	.86	608	.63	.28***	.48***	1.00			
4. Agreeableness	4.72	.85	607	.91	.42***	.28***	.28***	1.00		
5. Neuroticism	3.87	1.09	607	.89	.04	−.19***	−.17***	.10**	1.00	
6. Extraversion	3.64	1.09	603	.71	.11**	.21***	.14***	.09*	−.29***	1.00

* $p < .05$, ** $p < .01$, *** $p < .001$

ranged from .36 to .84 (see Table 2). The results of the confirmatory factor analysis suggested that the one-factor model with five items of the Chinese GQ possessed better factorial validity than the original one-factor model with six items in a Taiwanese sample. Once again, the second confirmatory factor analysis supported the validity of the one-factor model with five items.

The Cronbach's α of all of the scales used in this study were above the .70 benchmark (Nunnally and Bernstein 1994) for the total sample except optimism, which was slightly lower than the recommended limit and should be treated with care (see Table 3). To examine the construct validity of the Chinese GQ, Pearson's correlation was conducted with the total sample to examine its relation with happiness score, optimism score, agreeableness score, neuroticism score, and extraversion score. It was found that gratitude score significantly related to happiness score ($r = 31$, $p < .001$), optimism score ($r = .28$, $p < .001$), agreeableness score ($r = 42$, $p < .001$), and extraversion score ($r = .11$, $p < .01$). However, the relationship between the Chinese GQ and neuroticism score ($r = .04$, ns) was not significant.

4 Discussion

The aim of this study was to examine the validity of the GQ in a sample of Taiwanese undergraduate students. Confirmatory factor analysis indicated that the 5-item GQ possessed better psychometric properties than the original 6-item model. Furthermore, the model stability of the GQ was demonstrated when the cross-validation was conducted with a separate sample. The Chinese GQ also has adequate factorial validity. Furthermore, the GQ global score modestly correlated with several relevant theoretical constructs (i.e., happiness, optimism, agreeableness, and extraversion), supporting its construct validity. The current results suggest that the GQ is an adequate measure for assessing gratitude.

Although the results supported the reliability and validity of the GQ in a Taiwanese sample, there were three findings worth mentioning. First, item 6 was not retained in the final version of the Chinese GQ since the one-factor model with 6 items did not demonstrate a good model fit. This suggests that item 6 (*Long amounts of time can go by before I feel grateful to something or someone*) was not valid for assessing individual differences on gratitude in the sample of Taiwanese undergraduate students. One possible explanation for this may be the absence of diverse life experiences in the current student sample. Although the mean age of the current sample was similar to that of the McCullough et al. (2002) sample, guileless school life events may not stimulate students to be grateful to someone or something. An alternative explanation is that item 6 indicates a temporal definition of gratitude and is perhaps less likely to be linear. It may be inappropriate for the current

study as it focuses on one's present beliefs. However, these speculations should be further examined in the future. Second, it should be noted that item 3 had a lower factor loading than the other items across two cohorts of data (.34 for Cohort 1 and .36 for Cohort 2). However, we consider the low factor loading acceptable because (1) abandoning item 3 might violate the understanding of gratitude as items from differing aspects are valuable when defining constructs (Wu and Yao 2008) and (2) the fit indices of the 5-item model was adequate in both cohorts of the sample, leading us to recommend the 5-item model with confidence. The third finding worth considering was the non-significant correlation between gratitude and neuroticism. This result was not in accord with McCullough et al. (2002) and Wood et al. (2008a, b, c), but supported Neto's (2007) study on a Portuguese sample. A previous study with a sample of students (study 2; McCullough et al. 2004) that used adjectives to assess people's daily grateful mood also found a non-significant relation between gratitude and neuroticism. Unfortunately, the relationship between the GQ and neuroticism was not reported in their study (study 1 and study 2; McCullough et al. 2004). Certainly, the inconsistent association between gratitude and neuroticism must be further investigated.

Nevertheless, other constructs related to gratitude showed expected results based on previous studies (McCullough et al. 2002; Wood et al. 2007). It was found that more grateful students were happier about their life, as suggested by their higher subjective well-being. Correlation analysis also indicated a low to modest positive relationship among the GQ, optimism, agreeableness, and extraversion, which suggested that grateful individuals were more enthusiastic, altruistic, genuine, congenial, and optimistic. It was indicated that gratitude was not simply a linear combination of basic constructs, but could be seen as a distinct construct (McCullough et al. 2002). The present findings also corresponded to those of previous studies (McCullough et al. 2002; Neto 2007).

In summary, our study supported the factorial and construct validity of the Chinese GQ, which may be a proactive approach to understanding people's well-being in the Chinese-speaking population. We believe validating the Chinese GQ will facilitate research focused on human strength. It is also important to examine the related constructs that are well documented in the literature such as well-being and prosocial behavior in order to perform cross-cultural comparisons. This would make significant contributions to the literature pertaining to the Chinese population.

There are two main limitations of the research presented here that should be noted. First, the participants in this study were all undergraduate students and research has indicated that levels of gratitude vary with age (McAdams and Bauer 2004). Thus, this might constrain the generalization of these findings to different aged populations. Thus, we can only recommend that the GQ is an appropriate measure for undergraduate students. Future studies should recruit a more diverse sample to validate the GQ and special consideration should be placed on item 6 in these future studies. Second, the measures were all based on self-report and the data were collected at a single time point. This might result in a common-method effect and inflate the coefficient. Given that validation is a continual process, future research can use multiple methods to examine the validity of the GQ such as observer rating and experimental manipulation.

In conclusion, the results of the current study indicated that the one-factor with five items model of the GQ possessed a more satisfactory factorial validity than the six items model in Taiwanese undergraduate students. Furthermore, the GQ was correlated with several theoretically related constructs, which further supports its construct validity.

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