

Psychometric properties of the Cognitive Fusion Questionnaire (CFQ) from a sample of Ecuadorian college students

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Abstract: Cognitive Fusion is related to psychological problems, such as anxiety and depression, and is assessed through the Cognitive Fusion Questionnaire (CFQ). Aim: to confirm the unidimensional structure of the CFQ, its internal consistency reliability, and convergent and divergent validity in a sample of Ecuadorian college students. Method: instrumental design using Confirmatory Factor Analysis (CFA) and Structural Equation Modeling (SEM) to estimate convergent and divergent validity of the CFQ. Participants: 356 college students (59.1% women) aged between 18 and 58 years ($M = 25.52$, $SD = 7.51$) from several universities in Ecuador (43.9% public institutions). Results: the unidimensional structure of the CFQ is confirmed, through adequate fit indices. Its reliability is excellent ($\omega = .954$) and, regarding convergent and divergent validity, it correlates positively with Experiential Avoidance (AAQ-II) and negatively with Satisfaction with Life (SWLS). Conclusion: The Psychometric properties of the CFQ are adequate for its application in Ecuadorian college students.

Keywords: College students; Cognitive fusion; Reliability; Validity.

Mental health and cognitive fusion

Mental health is critical during adulthood or in the transition to it. According to the World Health Organization (WHO), the prevalence of mental disorders has increased in recent years. Depression has a prevalence of 4.4% and anxiety 3.6% worldwide (WHO, 2017). The trend in Latin America and Ecuador is similar among university students. Depression and anxiety has worsened due to the COVID-19 pandemic (Larzabal-Fernandez et al., 2023; Moreta-Herrera et al., 2022; Rodas et al., 2022). Additionally, investments in psychological and psychiatric services are scarce; and many people suffering from mental disorders do not have access to proper treatment (Kohn et al., 2018; Moreta-Herrera et al., 2021a; Sánchez-Vélez & Moreta-Herrera, 2022).

Regarding college students, it is evident that psychological problems have a significant presence. For example, there is evidence of a higher incidence of eating disorders and depression than other disorders among college students in the United States (Kaur Kang et al., 2021). This is consistent with global studies that have found a prevalence of approximately 25% for depression (Sheldon et al., 2021). In the case of Ecuador, there is evidence of the presence of suicide risk (13.1%) and eating disorders (32.0%; Torres et al., 2017). There are also levels of social dysfunction and somatization above the symptoms of anxiety or depression, with a general report of approximately 24% of psychological discomfort occurring during the course of higher education (Moreta-Herrera et al., 2021b).

Based on the research results, the promotion of timely psychological interventions should be required to placate psychological distress. Thus, Acceptance and Commitment Therapy (ACT) is recommended for the promotion and intervention in the mental health of college students. With promising results to manage anxiety, depression, and stress (Morin et al., 2021), and eating disorders (Karekla et al., 2022). Also, research suggests ACT can help increase academic performance and reduce procrastination among students (Chase et al., 2013; Wang et al., 2017), making ACT a broad-spectrum therapy, which can help achieve both therapeutic and academic objectives.

ACT involves the inclusion of mindfulness for the acceptance of thoughts and feelings categorized as negative; along with the application of techniques to clarify values and achieve behaviors that will be meaningful in life (Bennett & Oliver, 2019). According to ACT, there are six processes that constitute the pattern of psychological inflexibility which cause psychological distress: 1) conceptualized past and feared

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future; 2) lack of values clarity; 3) experiential avoidance; 4) cognitive fusion; 5) inaction or impulsivity; and 6) attachment to the conceptualized self. The objective of ACT intervention is to increase behaviors toward psychological flexibility to promote the following six opposite processes: 1) being present; 2) valuing; 3) acceptance; 4) cognitive defusion; 5) committed action; and 6) self as context (Hayes et al., 2012).

Among these processes related to psychological inflexibility, Cognitive Fusion (CF) stands out as a variable of interest due to its crucial role in anxiety (Cookson et al., 2020), depression (Pinto-Gouveia et al., 2020), and eating disorders (Scardera et al., 2021). CF is conceptualized as the tendency to respond to the content of thoughts in a literal way, as if they were a true representation of events (Luoma et al., 2007). Therefore, negative thoughts are experienced unpleasantly, and their presence causes psychological distress. It also causes subsequent behaviors to obey thoughts exclusively, hence, significant behaviors for the person are abandoned (Bennett & Oliver, 2019). CF is entangled with experiential avoidance, since the person seeks to avoid the distress caused by unpleasant thoughts, performing avoidance behaviors to modify the frequency and topography of these cognitions. For example, using techniques to stop or change your thoughts (Hayes et al., 2012). On the other hand, from the ACT, the Cognitive Antifusion techniques are proposed, to modify the person's relationship with their thoughts, that is, they do not see them as a reality or absolute truth (José Quintero et al., 2022).

Regarding the prevalence of CF, previous studies have found that in the general population and college students assessed with the Cognitive Fusion Questionnaire (CFQ), the total mean of the sample does not exceed the mean score of the instrument. In evaluations carried out on clinical samples, however, CF values are usually significant, demonstrating the importance of evaluating this construct (China et al., 2018; Gillanders et al., 2014; Ruiz et al., 2017). In this sense, CF is present in several psychological disorders, like anxiety (Cookson et al., 2020) and depression (Pinto-Gouveia et al., 2020). In addition, it is a strong predictor of mental health problems, including academic stress in college students (Krafft et al., 2019); thus, its analysis is central. In the case of Ecuador, there are no studies related to its prevalence at the time of the current study.

Cognitive fusion assessment

Due to the relevance of CF in psychological distress, it is imperative to develop instruments to assess and identify the condition. In view of this, Forman et al. (2012) proposed the Drexel Defusion Scale (DDS), which aims to measure a process opposite to cognitive fusion. In the case of anxiety, Herzberg et al. (2012) created the *Believability of Anxious Feelings and Thoughts Questionnaire (BAFT)*. It also highlights the Cognitive Fusion Questionnaire (CFQ; Gillanders et al., 2014), whose specific objective is to measure CF in a general way without relating it to psychological problems or particular cognitions.

The CFQ was created in the United Kingdom, and it initially contained 42 items, related to the credibility of thoughts, emotional reactions towards them, and behavior ruled by cognitions among others. After performing an exploratory factor analysis (EFA), seven items displayed optimal correlations and were selected for the current instrument. According to scientific literature, the CFQ suggests a unidimensional model. In a confirmatory factor analysis (CFA), fit indices were acceptable with $\chi^2 = 40.857$; $df = 14$; $p < .001$; $\chi^2/df = 2.918$; CFI = .986; SRMR = .049; RMSEA = .065 in the general population. Moreover, the internal consistency is high ($\alpha = .90$). Regarding convergent and divergent validity, the CFQ positively correlates with scales assessing experiential avoidance ($r = .72$; $p < .001$), rumination ($r = .39$; $p < .001$), and automatic thoughts ($r = .61$; $p < .001$); and negatively correlates with mindfulness scale ($r = -.50$; $p < .001$) and satisfaction with life ($r = -.39$; $p < .001$).

The instrument is broadly used for assessment and research within the ACT, therefore, several studies have analyzed its psychometric properties in different populations. Evidence reveals that the unidimensional structure of the CFQ is the most optimal configuration among college students and the adult population in Greece (Zacharia et al., 2021); and the general population and clinical population in Germany (China et al., 2018). Other studies require the presence of correlated errors² to improve the fit indices of the instrument. For instance, Flynn et al. (2018) allow the correlation between items 1 and 2, 2 and 5, and 3 and 5 in Latin American college students who live in the United States; while in South Korea, Kim and Cho (2015) correlated items 6 and 7 in a similar sample. Romero-Moreno and his colleagues (2014) were the first to adapt the instrument to the Spanish language, and studied its psychometric properties in a sample of Spanish adults. They concluded that the seven items show a unidimensional structure. Moreover, they obtained a Cronbach's alpha of $\alpha = .87$, which makes it hypothetically valid for the Spanish-speaking population. Concerning convergent and divergent validity, the scale positively correlates with experiential

² The correlation of errors between items is used when their covariance is not fully justified by the objective construct. That is, between the items there is another aspect that explains their relationship. In the CFQ it has been used due to the strong textual similarity between the items.

avoidance ($r = .67$; $p < .01$) and negatively correlates with satisfaction with life ($r = -.38$; $p < .01$), which is similar to the results obtained by Gillanders et al. (2014).

In Latin America, the validity and psychometric properties of the scale have also been studied, although scarcely in the region. For example, a study carried out on Argentine adults confirmed the unidimensional model with high internal consistency reliability ($\alpha = .89$), the authors also showed evidence of convergent validity with experiential avoidance ($r = .74$; $p < .01$; José Quintero et al., 2022). Likewise, a study on Colombian college students (with slight linguistic modifications) concluded the unidimensionality of the measure and its excellent internal consistency ($\alpha = .89$; Ruiz et al., 2017). In the Peruvian population, it obtained a similar dimensionality and internal consistency ($\omega = .916$; Valencia & Falcón, 2019); and in the Brazilian population (correlating the errors of items 1 and 2, and 2 and 3) it got an adequate internal consistency ($\alpha = .93$; Lucena-Santos et al., 2017). As it relates to Ecuador, the psychometric properties of the CFQ are unknown in any population segment. This represents a major difficulty, since the relationship between CF and psychological distress is important and Ecuadorian college students are a complex population, with significant problems, such as psychological discomfort, depression, and suicidal risk (Moreta-Herrera et al., 2021b). Consequently, this phenomenon must be investigated to know its real impact on the national context, and it is essential to have appropriate instruments for its respective measurement.

Objectives and hypothesis

Based upon the former bibliographical review, the objectives of the study are a) To analyze the validity of the CFQ through a unidimensional model fit in a sample of Ecuadorian college students; b) To identify convergent and divergent validity evidence of the CFQ; c) To determine the internal consistency reliability of the CFQ. We hypothesized that the CFQ has a one-factor structure (H_1), displays theoretically consistent relationships with other variables, e.g. positive correlation with experiential avoidance and negative correlation with satisfaction with life (H_2), and presents high internal consistency reliability (H_3).

METHOD

Design

This quantitative and cross-sectional study applied an instrumental design (Hedrih, 2020). It analyzed whether the internal structure of the CFQ corresponded to a unidimensional model, evaluating the internal consistency reliability, and convergent and divergent validity of the CFQ in a sample of Ecuadorian college students.

Participants

The sample corresponded to 356 college students from several Ecuadorian universities. 59.1% of the participants were women, aged between 18 and 58 years ($M = 25.52$, $SD = 7.51$). The participants enrolled in public institutions represented the majority of the sample (43.9%) followed by students from private institutions (28.6%), and students from technical and technological institutes (27.5%). Broken down by college major, 27.5% studying technical and technological careers; 20.4% study engineering; 18.5% psychology; 13.4% economic and business sciences; 6.8% architecture and design; 6.5% law; 4.4% education; and 1.1% exact sciences.

We used a non-probability convenience sampling with the following inclusion criteria: a) being an undergraduate student; b) legally enrolled at one of the higher institutions in Ecuador; c) attending classes frequently; d) signing informed consent. The attendance criterion was corroborated using an option within the questionnaire that made it possible to know the participant's frequency of class attendance.

Instruments

Cognitive Fusion Questionnaire (CFQ). This is a 7 items questionnaire completed on a seven option Likert scale, ranging from 1 (never true) to 7 (always true). It assesses CF to general thoughts, with a total score oscillating from 7 to 49. The higher the score, the higher the level of cognitive fusion (Gillanders et al., 2014). For this study, we used the Spanish validation developed by Ruiz et al. (2017), which obtained a Cronbach's alpha of $\alpha = .93$.

Acceptance and Action Questionnaire-II (AAQ-II). This is a 7 items questionnaire completed on a seven-option Likert scale, ranging from 1 (never true) to 7 (always true). It assesses experiential avoidance, where the minimum score is 7, and the maximum is 49. The higher the score, the greater the level of experiential

avoidance (Bond et al., 2011). For this research, we used the Spanish version developed by Ruiz et al. (2016), which obtained a Cronbach's alpha between $\alpha = .88$ and $\alpha = .91$ in the Colombian population.

Satisfaction with Life Scale (SWLS). This is a questionnaire proposed by Diener and his collaborators (1985), whose purpose is to measure the individual's perception of their well-being concerning certain characteristics of their life. It is made up of 5 items, which are scored according to a Likert scale of seven options ranging from 1 (totally disagree) to seven (totally agree). The scores, therefore, fluctuate between 5 and 35; and the higher the score, the greater life satisfaction is obtained. In the Ecuadorian population, Arias and Garcia (2018) got a Cronbach's alpha of $\alpha = .81$.

Procedure

The data was collected through the Google Forms application. The online form contained informed consent, the research objectives, and the information corresponding to the anonymity and confidentiality of the participants. The approximate response time was 10 minutes. We used the snowball method, which encouraged participants to share the questionnaire with people who meet the research inclusion criteria. The data collection took place from December 2021 to the end of March 2022. Afterwards, the data was systematized and the information of participants who did not meet the inclusion criteria was filtered. Next, we carried out the statistical analysis to perform the hypothesis contrast and confirm or refute the unidimensional model of the CFQ, and calculate the internal consistency reliability and convergent and divergent validity. We included the results in the final report. This study met the ethical standards in all of its stages, in accordance with the Declaration of Helsinki for the development of research with human beings.

Data analysis

Descriptive statistics of the CFQ items, such as the mean (M), standard deviation (SD), asymmetry (g_1), and kurtosis (g_2), were obtained to determine the behavioral dynamics of the response pattern of the participants. In addition, compliance with univariate normality was fulfilled when g_1 and g_2 remained within the range of ± 2 (George & Mallery, 2010). Finally, to determine whether the data complied with multivariate normality, it was analyzed using the Mardia test (1970). The former analysis is relevant because it helps in the decision-making process about whether or not to use classical or robust estimation methods for multivariate statistics.

Regarding the CFA, the polychoric correlations were first calculated between the items. Then, the unifactorial structure test was calculated using the Diagonally Weighted Least Squares (DWLS) estimator, which is recommended when the data do not meet multivariate normality (Li, 2016). To evaluate the fit of the model, we used absolute fit indices such as the Chi-square test (χ^2), where no significance was expected ($p > .05$), Normed Chi-square (χ^2/df), expected to be less than 4, and the Standardized Mean Square Residual (SRMR), which had to be less than .06. We also analyzed relative fit indices, such as the Comparative Fit Index (CFI), and Tucker Lewis Index (TLI), expected to be greater than .95. The Root Mean Squared Error of Approximation (RMSEA) as a non-centrality based indicator was expected to be less than .08 (Ferrando & Anguiano-Carrasco, 2010; Hu & Bentler, 1999). Finally, the factor loadings (λ) of each item concerning the construct were found and expected to be greater than .50 (Dominguez-Lara, 2018).

Regarding internal consistency, the Omega coefficient (ω) was calculated, which is appropriate when the data do not present multivariate normality (Flora, 2020). In addition, we calculated the internal consistency reliability if an item was removed. On the other hand, for convergent and divergent validity evidence, a general fit model was used through structural equation modeling (SEM) using the DWLS estimator. In other words, a model was built with the relation between the CFQ and the AAQ; and the CFQ with the SWLS, which allowed the evaluation of whether the CFQ was coherently related to the other instruments at the level of latent relationships.

Statistical management was performed using the R programming language in version 4.1.0 (R Core Team, 2021) through the psych package, for descriptive analysis (Revelle, 2022); the MVN package, for the Mardia test (Korkmaz et al., 2014); the Lavaan package for the polychoric correlations and the CFA (Rosseel, 2012) and Misty package for the internal consistency analysis (Yanagida, 2022).

RESULTS

Preliminary analysis of the items

Table 1 presents the results of the descriptive analysis of the CFQ items. The averages are concentrated in the central values of the Likert scale, in the range between $M_{(item\ 2)} = 3.23$; $SD = 1.77$ and $M_{(item\ 3)} = 3.70$; $SD = 1.87$. Regarding asymmetry and kurtosis, compliance with univariate normality is fulfilled since the values are between ± 2 (George & Mallery, 2010). However, the Mardia test suggests that there is no

multivariate normality due to the value being significant in asymmetry and kurtosis ($p < .05$). Overall, the presence of CF in the sample was close to the average of the instrument ($M = 24.33, SD = 11.45$). Thus, it can be considered that a moderate presence exists. In addition, the table of polychoric correlations between items fluctuated between $r_{(items\ 3-5)} = .65$ and $r_{(items\ 6-7)} = .86$.

Table 1. Preliminary analysis of CFQ items.

Items	Descriptive statistics				Polychoric correlations							
	<i>M</i>	<i>SD</i>	<i>g</i> ₁	<i>g</i> ₂	1	2	3	4	5	6	7	
Item 1	3.70	1.75	0.34	-0.95	1							
Item 2	3.23	1.77	0.48	-0.87	.78	1						
Item 3	3.70	1.86	0.21	-1.10	.68	.68	1					
Item 4	3.41	1.84	0.42	-0.92	.77	.79	.70	1				
Item 5	3.21	1.96	0.55	-0.99	.74	.75	.65	.82	1			
Item 6	3.48	1.87	0.35	-1.08	.75	.80	.74	.81	.85	1		
Item 7	3.60	1.98	0.36	-1.19	.74	.79	.71	.81	.80	.86	1	
Mardia			369.45**	20.20**								

Note: *M*= Mean; *SD* = Standard Deviation; *g*₁ = Asymmetry; *g*₂ = Kurtosis; ** = $p < .01$.

Confirmatory Factor Analysis

A CFA was performed using the DWLS estimator. Four models were evaluated: a) the original unidimensional model proposed by Gillanders et al. (2014); b) the Flynn et al. (2018) model with correlated errors (1 and 2, 2 and 5, and 3 and 5); c) the Lucena-Santos et al. (2017) model with the correlation between items (1 and 2, and 2 and 3); and c) the correlation between items 6 and 7 of Kim and Cho (2015).

The results are presented in Table 2. Results indicate that the most parsimonious model for Ecuadorian college students is the original unidimensional model proposed by Gillanders et al. (2014), which does not require any modification or error correlation between items. Regarding the absolute fit indices, the Chi-square (χ^2) is not significant ($p > .05$), and the Normed Chi-Square (χ^2/df) is less than 4, which represent acceptable values. Similarly, the CFI, TLI, SRMR, and RMSEA indicate that the model mentioned is the most suitable for the Ecuadorian college population.

Table 2. Confirmatory Factorial Analysis of the CFQ.

Models	χ^2	<i>df</i>	χ^2/df	CFI	TLI	SRMR	RMSEA
Unidimensional	21.81; $p > .05$	14	1.558	.99	.99	.019	.039 [.001 - .069]
Unidimensional (Items 1 and 2, 2 and 5, 3 and 5 correlated)	10.93; $p > .05$	11	0.994	.99	.99	.012	.001 [.001 - .055]
Unidimensional (Items 1 and 2, 2 and 3 correlated)	15.98; $p > .05$	12	1.332	.99	.99	.016	.030 [.001 - .065]
Unifactorial (Items 6 and 7 correlated)	19.02; $p > .05$	13	1.463	.99	.99	.018	.036 [.001 - .068]

Note: χ^2 : chi-square; *df*: degrees of freedom; χ^2/df : normed chi-square; CFI: Comparative Fit Index; TLI: Tucker Lewis Index; MSEA: Mean Square Error of Approximation; SRMR: Standardized Root Mean Square Residual.

Regarding the factor loadings of the one-factor model, Figure 1 indicates that the loadings are found above $\lambda > .50$. The values range between $\lambda_{(item\ 3)} = .778$ and $\lambda_{(item\ 6)} = .931$. It can therefore be inferred that each item contributes significantly to the construct and allows a better explanation of the variance.

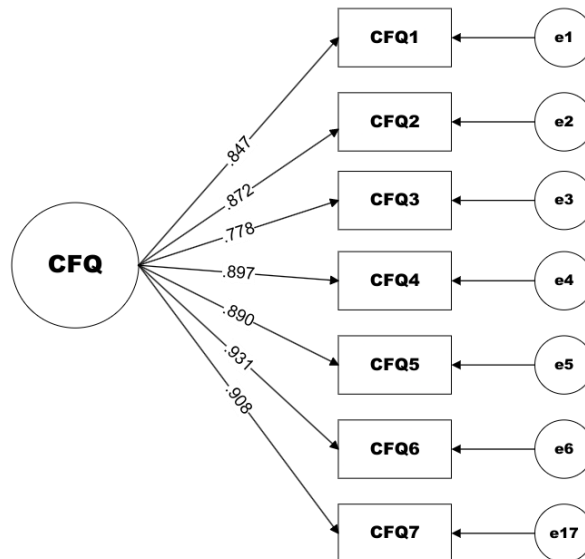


Figure 1. Factorial structure of the CFQ.

Internal consistency reliability and convergent and divergent validity

Internal consistency reliability was calculated using the Omega coefficient. The Omega coefficient of the CFQ is excellent $\omega = .954$; CI 95% [.946 - .961]. Therefore, there is a high reliability in the instrument's scores. Table 3 shows the internal consistency reliability results when removing an item from the questionnaire. As shown, the Omega coefficient decreases in its reliability if any of the items are removed, therefore, it is not appropriate to remove any item.

Table 3. Preliminary analysis of the CFQ items.

Items	Omega Coefficient if Item Deleted
My thoughts cause me distress or emotional pain.	.946
I get so caught up in my thoughts that I am unable to do the things I most want to do.	.946
I over-analyze situations to the point where it is unhelpful to me.	.953
I struggle with my thoughts.	.943
I get upset with myself for having certain thoughts.	.944
I tend to get very entangled in my thoughts.	.939
It is such a struggle to let go of upsetting thoughts even when I know that letting go would be helpful.	.944
Total	.954 [.946 - .961]

Note: 367 cases.

Figure 2 shows the results of the SEM model where the values of CFQ correlated with the values of AAQ-II and SWLS, where good fit indices were obtained. Similarly, the latent correlations are consistent with the theory and with previous studies, since the CFQ shows a high positive correlation with the AAQ-II ($r = .889$; $p < .001$), and a low negative correlation with SWLS ($r = -.208$; $p < .001$). Therefore, the validity of the instrument is considerable.

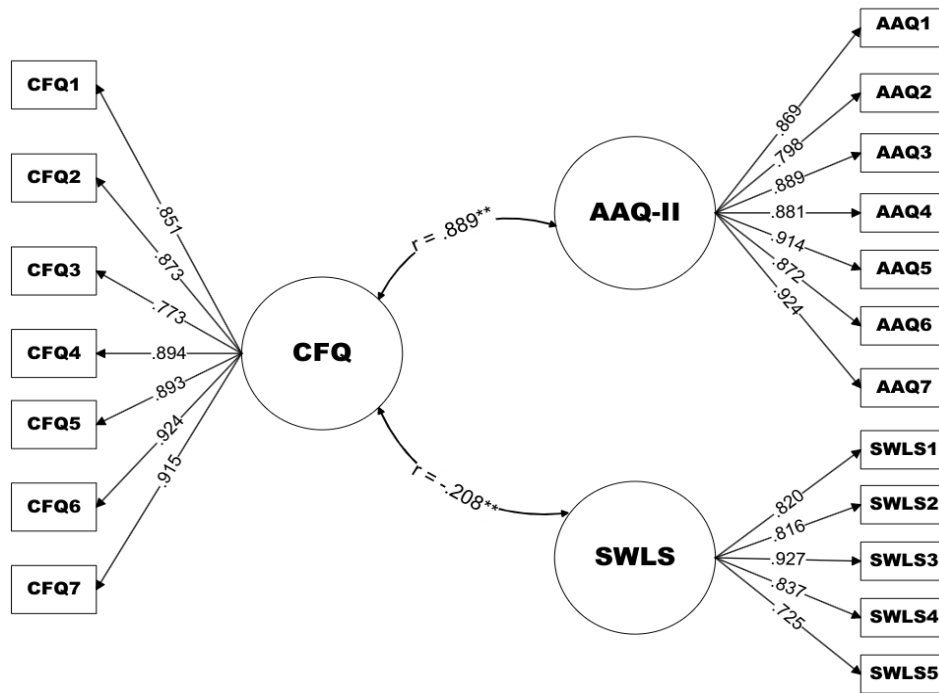


Figure 2. Analysis of the latent correlations between the instruments.

Note: CFQ = Cognitive Fusion Questionnaire; AAQ-II = Acceptance and Action Questionnaire AAQ-II; SWLS = Satisfaction with Life Scale.

DISCUSSION

The objectives of the present study were to determine the factorial validity of the CFQ, its internal consistency reliability, and convergent and divergent validity in a sample of Ecuadorian college students.

In the descriptive analysis of the test, the differences between the means were not significant, which shows homogeneity in the response pattern of each question. Regarding the distribution, although the items met the assumption of univariate normality (assessed by g_1 and g_2), that was not the case in the assumption of multivariate normality since the Mardia test for g_1 and g_2 was significant ($p < .05$). This suggested the use of robust estimators to analyze the factorial structure of the CFQ (Li, 2016). Regarding the prevalence of CF, the sample had a total mean close to half of the total score of the instrument. In this case, the presence of CF is relatively moderate, which differs from other studies among college students that suggest low levels of CF (Flynn et al., 2018; Ruiz et al., 2017; Valencia & Falcón, 2019). This suggests a different dynamic of the phenomenon within the Ecuadorian context that will require further studies. These results converge with those presented by Moreta-Herrera et al. (2021b) on the presence of psychological distress in college students and the existing risk. Among the risk factors, the significant relationship between low social support and low self-esteem with depression and suicidal risk stands out (Torres et al., 2017). However, the mean score obtained in CF is still lower than the scores obtained among clinical samples (Gillanders et al., 2014; China et al., 2018; Ruiz et al., 2017).

Regarding the factorial structure of the CFQ, the four models analyzed (Gillanders et al., 2014; Flynn et al., 2018; Kim & Cho, 2015; Lucena-Santos et al., 2017) showed a good one-dimensional fit in the CFAs through different indices (χ^2 , χ^2/df , CFI, TLI, SRMR, and RMSEA; Ferrando & Anguiano-Carrasco, 2010; Hu & Bentler, 1999). However, since the unidimensional solution without correlating errors between items was originally proposed (Gillanders et al., 2014), it was less complex in its construction and more parsimonious. The result of this analysis is similar to the research carried out with Spanish-speaking college students in Peru (Valencia & Falcón, 2019), Colombia (Ruiz et al., 2017), and even in a sample of adults from Argentina (José Quintero et al., 2022) and Spain (Romero-Moreno et al., 2014). Hence, it gives strength to this model as the most appropriate in the region. Although to verify this assumption, cross-cultural studies are necessary to demonstrate the equivalence of measurement and the general test.

Regarding the convergent and divergent validity, the SEM analysis of the model demonstrates that the latent correlations are coherent with the theory. In this case, the relationship of the CFQ is positive and has high experiential avoidance ($r = .889$; $p < .001$). These results are similar to previous works among college students in Korea (Kim & Cho, 2015), the United States (Flynn et al., 2018), and Colombia (Ruiz et al., 2017); as well as among adult populations in the United Kingdom (Gillanders et al., 2014) and Argentina (José Quintero et al., 2022). On the other hand, the CFQ presents a low and negative correlation with the

SWLS ($r = -.208; p < .001$), which is consistent with the theoretical construction. These findings are similar to previous results about divergent validity in United States and Columbian college students (Flynn et al., 2018; Ruiz et al., 2017), and in the adult population of Spain (Romero-Moreno et al., 2014). For these reasons, it can be concluded that the validity of evidence based on relations with other variables of the CFQ is evident, and also relevant for individual or group evaluations of the Ecuadorian university population.

Finally, the reliability of internal consistency, evaluated by Omega's coefficient, is found to be excellent. The values found are high and all items are consistent with the construct; therefore, no modification is necessary. In addition, the results are appropriate and analogous to what Valencia & Falcón (2019) found under the same methodological criteria. Other studies in which Cronbach's alpha was used as a test to assess consistency support a similar conclusion (Gillanders et al., 2014; Ruiz et al., 2017), although the use of this test is questionable nowadays.

In general, it is concluded that the psychometric properties of the CFQ are optimal and that its use in the Ecuadorian population is reliable. At a theoretical level, these findings have relevant implications, since they provide empirical evidence that the unidimensional model without item correlation is the model with the best fit and the most parsimonious for the Ecuadorian and Spanish-speaking college population. In methodological terms, the use of robust estimators (DWLS) allows better control of the estimated bias and makes the results more efficient. The use of these estimators is limited among instrumental studies, so this work contributes precisely to its use since it is technically more acceptable. Similarly, the use of SEM analysis for convergent and divergent validity represents progress in psychometric studies of the CFQ. From a practical point of view, the implications show that the CFQ is a fundamental instrument that will allow psychologists to evaluate CF correctly, as well as enable the subsequent development of research that analyzes the implication of this construct in the psychological problems of the Ecuadorian population.

Limitations

This research has some limitations that are worth mentioning. First, the sample only includes college students; hence, inferences related to other populations must be carried out with caution. Likewise, the absence of clinical samples prevents the properties of this group being known and does not ensure its optimal application when evaluating within clinical interventions.

For these reasons, it is recommended that future research includes diverse populations, such as adolescents, adults, and the clinical population. Second, for the confirmatory factor analysis, the DWLS estimator was used. In some related works, the Maximum Likelihood (ML) estimator was mainly used, which does not allow appropriate comparisons to be made. It must be highlighted that robust methods are recommended when working with ordinal variables that do not meet the multivariate normality (Li, 2016). However, future research is needed to examine the consequences of one estimator versus another on the CFQ. Finally, it is common to analyze convergent and divergent validity with experiential avoidance (AAQ-II) and satisfaction with life (SWLS). It is recommended that for future research, more instruments such as the Automatic Thoughts Questionnaire (ATQ) should be added, as well as the Mindful Attention Awareness Scale (MAAS). Moreover, it is necessary to evaluate the temporal stability of the CFQ because the analysis of Test-retests in Latin America is limited.

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