

## Flourishing Scale in the Atheist Community of Puerto Rico: Validation and Psychometric Study

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Juan Aníbal González-Rivera, Psy. D<sup>1</sup>  
*Ponce Health Sciences University, Puerto Rico*

### Abstract

This article examines the psychometric properties of the Flourishing Scale in the atheist community of Puerto Rico. A total of 380 atheists participated in this exploratory and psychometric study. The results confirmed that the scale has a one-dimensional structure. The eight items complied with the discrimination criteria. The reliability index of the scale was of 0.87 (Cronbach's alpha) psychometrically adequate according to Kline (2005). These results suggest that the Flourishing Scale has the potential to measure this construct among the atheist community of Puerto Rico. We recommend the use of this scale for the development of new research regarding psychological well-being and possible correlations with other psychosocial variables in the atheist community.

Keywords: *atheism, psychological well-being, flourishing, psychometric properties, validation*

### Resumen

El presente estudio analiza las propiedades psicométricas de la Escala de Florecimiento en la comunidad atea de Puerto Rico. Un total de 380 ateístas participaron en este estudio de carácter exploratorio y psicométrico. Los resultados confirmaron que la escala mantiene una estructura unidimensional. Los ocho ítems de la escala cumplieron con los criterios de discriminación. El índice de confiabilidad alfa de Cronbach de la escala fue 0.87 considerado como adecuado psicométricamente (Kline, 2005). Estos resultados sugieren que la Escala de Florecimiento tiene el potencial para medir este constructo en la comunidad atea de Puerto Rico. Recomendamos que la escala se utilice para el desarrollo de nuevas investigaciones sobre el bienestar psicológico y sus posibles correlaciones con otras variables psicosociales en la comunidad atea.

Palabras claves: *ateísmo, bienestar psicológico, florecimiento, propiedades psicométricas, validación*

<sup>1</sup>Juan A. González-Rivera, Psy.D., Assistant Professor, School of Behavioral and Brain Sciences, Ponce Health Sciences University, San Juan University Center, Puerto Rico.

Correspondence: Dr. Juan A. González-Rivera, 500 West Main Suite 215, Bayamón, Puerto Rico, 00961. Tel.: 011 787 315 6034. jagonzalez@psm.edu

The empirical research about psychological well-being in the Puerto Rican atheist community has been limited. Essentially, there was no empirical literature concerning the psychological and subjective well-being in atheists until 2010 (Martínez-Taboas & Orellana, 2017). This fact demonstrated the lack of interest that prevailed during decades concerning topics related to the atheist community in the psychology field (González-Rivera, Rosario-Rodríguez, Rodríguez-Ramos,

Hernández-Gato, & Torres-Báez, 2019). Likewise, many behavior professionals have labeled atheist individuals as empty, not having a purpose in life, and being neurotic, asocial, selfish, and immoral (Martínez-Taboas, Varas-Díaz, López-Garay, & Hernández-Pereira, 2011). In popular terms, there is a generalized perception about the atheist community that qualifies them as insensitive, satanic, cynical, and lustful (González-Rivera, Pabellón-Lebrón, & Rosario-Rodríguez, 2017a).

This scenario could explain the reason why there are no empirical studies that assess the psychometric properties of positive psychological functioning scales in the atheist community. This fact results interesting – and unfortunate at the same time – when it has been shown historically that this community has been one of the most marginalized groups in Western countries (Gervais & Norenzayan, 2013; Doane & Elliott, 2015). The origin of this marginalization lies in rejecting the existence of God in a highly theistic society. In this sense, the atheist – someone who does not adhere to the central principles of theism and does not believe in God or gods (Cliteur, 2009) – is demonized in the hands of theistic majorities. In fact, a study conducted in Puerto Rico with 348 atheists reported that 82% of the participants showed significant levels of perceived discrimination (González-Rivera et al., 2017a).

In Puerto Rico, very few studies have directly examined the psychological well-being of atheists (González-Rivera et al., 2017a; González-Rivera et al., 2019; González-Rivera, Quintero-Jiménez, Veray-Alicea, & Rosario-Rodríguez, 2017b; Martínez-Taboas & Orellana, 2017). Most of these studies have used the Psychological Wellbeing Scale (Ryff, 1995), the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), and the Flourishing Scale (Diener et al., 2010) as measurement instruments. The first two instruments have been validated through psychometric studies in numerous countries. However, the Flourishing Scale is the most recent and has slight psychometric evidence in Latin America (Cassaretto & Martínez, 2017; González-Rivera, 2018). The Flourishing Scale measures

psychosocial success, taking the integration of the main psychological theories that deal with human flourishing and personal prosperity as the conceptual foundation. Specifically, it evaluates human well-being from an eudaemonic perspective (González-Rivera, 2018). This instrument has thrived due to its brief and easy administration.

Due to the lack of research in Puerto Rico and Latin America regarding how the atheist community describes its own psychological well-being, and in the need of having valid and reliable instruments to examine these constructs, a transverse, instrumental study, was designed to evaluate the psychometric properties of the Flourishing Scale in the atheist community of Puerto Rico (Ato, López, & Benavente, 2013). Specifically, this project has four main objectives: (1) analyze the factor structure of the instrument through confirmatory factor analysis, (2) examine the discriminatory capability of the items, (3) evaluate the reliability of the instrument, and (4) establish convergent validity through the correlation with a measure of psychological well-being (life satisfaction).

## Method

### Participants

The sample consisted of 380 atheists, residents of Puerto Rico, selected upon availability. The participants average age was 34.40 (SD = 9.57). Sociodemographic data of the sample is shown in Table 1. The inclusive criteria established for participating in the study was: be 21 years or older and be self-identified as an atheist (theological atheist and self-identified atheist). The exclusion criteria was to be self-identified as an agnostic.

Table 1.  
*Sociodemographic Data of Participants*

Variables	<i>f</i>	%
<i>Sex</i>		
Feminine	166	43.7
Masculine	214	56.3
<i>Annual Income</i>		
25,000 or less	208	54.7
26,000 – 50,000	122	32.1
51,000 – 100,000	42	11.1
101,000 or more	8	2.1
<i>Academic Background</i>		
High School or less	25	6.6
Associate or Technical	65	17.1
Bachelor's Degree	165	43.4
Master's Degree	79	20.8
Doctoral Degree	46	12.1

Note. *n* = 380, *f* = frequency.

## Measurements

**General Data Questionnaire.** To describe the study sample, a sociodemographic questionnaire was developed to obtain information regarding age, sex, academic background, among other variables.

**Flourishing Scale.** We used the flourishing scale developed by Diener et al. (2010), consisting of eight items, to assess the psychological well-being from an eudaemonic perspective (e.g. *I lead a purposeful and meaningful life; I am optimistic about my future*). Each item has a response scale of seven points, which fluctuates from “*fully disagree*” to “*fully agree*”. The possible range is from 8 to 56 points. A high score characterizes a person with resilience and psychological resourcefulness.

**Satisfaction with Life Scale (SWLS).** The Spanish version of the SWLS from Diener, Emmons, Larsen, and Griffin (1985) was used. These authors believe that life satisfaction constitutes the cognitive component of subjective well-being. The instrument consists of five items in total (e.g., *I am very satisfied with my life; In most ways my life is close to my ideal*), with a response scale of seven points fluctuating from “*totally disagree*” to “*totally agree*”. The lowest score that can be obtained is 5 and the highest is 35. High scores suggest a high life satisfaction. The Spanish version of the scale reported an Alpha of .77 (González-Rivera & Rosario-Rodríguez, 2019).

## General Procedures

Once the Institutional Revision Committee (IRB) of the Carlos Albizu University (San Juan, Puerto Rico) approved the procedures for this study, the participant recruitment stage started. A paid advertisement amongst popular social networks (such as Facebook, Twitter, Google+, WhatsApp, among others) was used. In this stage, the collaboration of Ateístas de Puerto Rico, an organization of atheist activism, was very useful, as they shared the ad in their social networks, which significantly speed up the process. The data compilation was carried out through online questionnaires using the PsychData platform. Once the data was collected, the psychometric properties of the Flourishing Scale were examined. The computer application IBM SPSS Statistics (version 24) and STATA (version 15.1) were used for the data analysis. In SPSS, discriminatory, reliability, and correlation analyses were performed. The confirmatory factor analysis was performed in STATA, using the maximum-likelihood estimation method and the Satorra–Bentler corrections (2001).

## Results

First, a confirmatory factor analysis with structural equations was carried out. To evaluate the adjustment of the model, the following goodness-of-fit tests were used: Chi-square test ( $\chi^2$ ), Root Mean Square

Error of Approximation (RMSEA), Tucker–Lewis Index (TLI), and Comparative Fit Index (CFI). For an adequate adjustment of the model, the CFI and TLI must be equal to or greater than .90 and the value of the RMSEA must be equal to or less than .08 (Byrne, 2010). Since the data was not normally distributed, the Satorra-Bentler adjustments were used to compute the adjustment of the structural equations' models, as the non-normality of the data modifies the standard error of the estimates and the global adjustment of the model. After the corrections were made, the results showed an adequate adjustment of the model, composed only by one latent factor that encompasses the eight items of the scale,  $\chi^2 = 131.139 (20) p < .001$ , RMSEA = .12, CFI = .92, TLI = .89,  $\chi^2$  corrected = 46.534 (20)  $p < .001$ , RMSEA corrected = .06, CFI corrected = .93, TLI corrected = .91. The obtained results are considered adequate adjustment levels (Byrne, 2010; Satorra & Bentler, 2001). Regression coefficients ranged between .60 and .79 (see Table 2).

Then, the discrimination of the eight items of the scale was analyzed through the item-total correlation index. The indexes ranged between .59 and .71 and all exceeded the recommended minimal value of .30 (Kline, 2005). Table 2 presents the discrimination indexes of the scale, the explained variance, and the regression coefficients of the confirmatory factor analysis with its respective confidence intervals. Later, an internal consistency analysis of the eight items was performed to determine the reliability index of the scale. The three methods used were as follows: Cronbach alpha coefficient, Spearman-Brown split half, and the Omega coefficient (see Table 3). All the indexes exceeded the minimum of .70, recommended by the literature to be considered a reliable instrument (DeVellis, 2017; Kline, 2000). Last, in order to evaluate the convergent validity of the scale, the correlation of the Satisfaction with Life Scale was analyzed. As can be seen in Table 3, the correlation index was significant and showed a positive association, which confirmed that the relationship among both scales is within the expected and they converge with each other.

Table 2  
*Descriptive and Distribution Statistics, Item Discrimination Indexes, Regression Coefficients, and Confidence Intervals*

Items	<i>M</i>	<i>SD</i>	Skewness	Kurtosis	Kolmogorov-Smirnov	Shapiro-Wilk	<i>r<sub>bis</sub></i>	<i>R</i> <sup>2</sup>	<i>β</i>	<i>I.C. 95%</i>
Item 1	6.42	1.000	-2.457	7.633	.36	.62	.71	.55	.78	[.69, .86]
Item 2	6.12	1.135	-1.621	2.877	.26	.76	.62	.42	.64	[.54, .74]
Item 3	6.40	.926	-2.398	8.386	.33	.66	.71	.57	.79	[.71, .87]
Item 4	6.50	.900	-2.475	7.798	.39	.61	.60	.38	.65	[.54, .76]
Item 5	6.76	.627	-4.924	37.086	.46	.41	.64	.53	.73	[.59, .87]
Item 6	6.72	.618	-3.571	21.585	.45	.49	.69	.57	.76	[.64, .88]
Item 7	6.23	1.211	-1.959	3.954	.33	.68	.64	.46	.68	[.60, .76]
Item 8	6.05	1.222	-1.569	2.594	.26	.76	.59	.41	.60	[.50, .70]

*Note:* *M* = Mean; *SD* = Standard Deviation; Skewness standard error = .125; Kurtosis standard error = .250. Degrees of freedom Kolmogorov–Smirnov and Shapiro–Wilk = 330, all the values  $p < 0.001$ ; *r<sub>bis</sub>* = Item discrimination indexes; *R*<sup>2</sup> = Explained variance; *β* = standardized regression coefficients; *p* = significance; *C.I. 95%* = confidence intervals of regression coefficients.

Table 3  
*Means, Standard Deviations, Alphas, Omega Coefficient, and Correlations*

	<i>M</i>	<i>SD</i>	<i>α</i>	<i>α<sub>stand</sub></i>	<i>ω</i>	<i>SB</i>	<i>1</i>	<i>2</i>
Flourishing Scale	51.21	5.71	.87	.89	.89	.84	-	.63
Satisfaction with Life	.26.97	6.32	.88	.89	.89	.85	.63	-

*Note:* *M* = Mean; *SD* = Standard Deviation; *α* = Cronbach’s alpha coefficient; *α<sub>stand</sub>* = Cronbach's standardized alpha; *ω* = Omega coefficient; *SB* = Spearman-Brown coefficient. ( $n = 380$ ).

## Discussion

Based on the findings of this study, it could be stated that the Flourishing Scale has adequate psychometric properties to examine the human well-being from a eudemonic perspective in the atheist community of Puerto Rico. The analyses performed to the Flourishing Scale showed an elevated reliability and validity of the instrument in the atheist community. In addition, the Flourishing Scale showed an adequate construct validity, tested through the confirmatory factor analysis, as well as an appropriate convergent validity.

Regarding the reliability of the instrument, consistent indexes were obtained to those evidenced by the scale in other studies (Cassaretto & Martínez, 2017; Diener et al., 2010; González-Rivera, 2018; Hone et al., 2014; Silva & Caetano, 2013; Sumi, 2013). The correlations of each item with the total score show a remarkable internal consistency. The moderately high correlation of the Flourishing Scale with the measure of life satisfaction provides evidence on the convergent validity of the scale and agrees with the correlation patterns obtained in other research (González-Rivera, 2018; González-Rivera et al., 2017a; Hone et al., 2014; Silva & Caetano, 2013).

In theoretical terms, the psychometric findings confirmed the unidimensionality of the scale. This is consistent with the research conducted both in Puerto Rico (González-Rivera, 2018) and in other countries (Cassaretto & Martínez, 2017; Hone, Jarden, & Schofield, 2014; Howell & Buro, 2015; Silva & Caetano, 2013), which suggests that the scale, until this moment, is not affected by sociocultural variables or attributes. This unique dimension assesses positive interpersonal relationships, feelings of competence, sense of purpose, and optimism. We must point out that these elements of human well-being have not been studied in depth in the atheist community of Puerto Rico. Only two empirical studies have addressed such aspects in the community (Martínez-Taboas & Orellana, 2017; González-Rivera et al., 2019), and that is why the use of the Flourishing Scale is suggested

to develop new research with atheist people and understand the psychological processes that stimulates their well-being.

In practical terms, it was shown that the Flourishing Scale can be used for the development of new research on psychological well-being and its possible correlations with other psychosocial variables in the atheist community. These studies might provide valuable information about this population from different perspectives and psychosocial approaches that can reveal a more complete profile of the atheist individuals. On the other hand, the simple language of the Flourishing Scale and its constitution of eight items makes the instrument useful and of easy administration and interpretation. In this sense, the Flourishing Scale is a practical and effective instrument in the research work within the atheist community of Puerto Rico.

Like all research, our study owns some limitations. First, the sample gathered was a convenience, non-probabilistic type, which makes the generalization of the results limited. Another limitation lies in the use of electronic platforms for data collection, since it restricts the opportunity to participate in research only to people who have access to the internet and the ones, that in a certain way, dominate the use of computers and/or are familiar with the use of digital platforms. However, the use of the internet for data collection is a growing practice in psychological and psychometric research. For future research, we recommend continuing the application of the inventory in other cultural contexts to establish the sensitivity of the variations in the indicators according to the context changes.

In summary, the psychometric properties obtained demonstrate that the Flourishing Scale shows adequate validity and reliability indexes. Based on these findings, it is concluded that the scale is an excellent measurement instrument for future research in the atheist community of Puerto Rico. Finally, we encourage behavioral professionals and graduate students of psychology to consider the psychological well-being in the atheist community as a topic for research or dissertation work.

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