

## Validez y confiabilidad de una Escala de Misericordia

### Validity and reliability of a Mercy Scale

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### Resumen

Se planteó como objetivo elaborar y determinar las evidencias de validez y de confiabilidad de una escala tipo Likert para medir la misericordia, entendida como ponerse en el lugar de otras personas, sentir compasión y ayudar, sin necesidad de recibir nada a cambio. Se trabajó con una muestra seleccionada de manera no probabilística e integrada por 284 participantes. A partir del Análisis Factorial Exploratorio, el método de validez convergente y el Análisis Factorial Confirmatorio, se estableció que 15 ítems se consolidan en un modelo unifactorial con adecuados índices de ajuste ( $\chi^2 = 183.00$ ,  $gl = 90$ ,  $\chi^2/gl = 2.03$ ,  $CFI = .92$ ,  $TLI = .90$ ,  $RMSEA = .07$  ( $RMSEA\ 90\% \text{ CI} = .056 - .086$ ),  $SRMR = .05$ ). En cuanto a la confiabilidad de la Escala, obtenida mediante el Coeficiente Omega, fue de .90. Se concluye que la Escala de Misericordia es unifactorial y dispone de adecuadas propiedades psicométricas de validez y de confiabilidad.

*Palabras clave:* confiabilidad, escala, misericordia, validez.

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## Abstract

The objective of the study was to elaborate and determine the evidence of validity and reliability of a Likert-type scale to measure mercy, understood as putting yourself in the place of other people, feeling compassion, and to help without the need to receive anything in return. We worked with a sample selected in a non-probabilistic way and made up of 284 participants. From the Exploratory Factor Analysis, the convergent validity method and the Confirmatory Factor Analysis, it is confirmed that 15 items are consolidated in a unifactorial model with adequate adjustment indices:  $\chi^2 = 183.00$ ,  $df = 90$ ,  $\chi^2/df = 2.03$ ,  $CFI = .92$ ,  $TLI = .90$ ,  $RMSEA = .07$  ( $RMSEA\ 90\% \text{ CI} = .056 - .086$ ),  $SRMR = .05$ . Regarding the reliability of the Scale, obtained through the Omega Coefficient, it was .90. It concludes that the Mercy Scale is unifactorial and has adequate psychometric properties of validity and reliability.

*Key words:* reliability, scale, mercy, validity

Mercy is consolidated into a human value, which manifestation acquires relevance and gives meaning to the life of those who practice it, especially in the present, in which there is a need to transcend our own needs to attend to those of others. It constitutes a value that is necessary to cultivate, promote and strengthen; especially in a post-modern context in which, according to Giraldo (2015), values associated with indifference, individualism, consumption and pleasure prevail and those of coexistence, mutual respect and solidarity are subordinated.

The Lima-Peru Jubilee Mission (1993), links mercy to charitable actions to help others in their bodily and spiritual needs. For Broveto (see Cordovilla & Fleta, 2015), it is a virtue that implies offering love, forgiveness and charity to those who need it. According to De Paiva (2017) it is an emotion or feeling of piety in the face of another's suffering. For Acevedo (2020) it implies encountering the human and putting affection in places and situations where there is only injustice, and, according to González de Cardedal (as cited in Sánchez, 2019), it represents the compassion and piety of God to forgive original sin.

Zyzak (2015) highlights that the dogmatic foundations of mercy allow to demonstrate its ethical-moral dimensions, but there are also other dimensions such as the pastoral, liturgical, social, legal, and psychological: Our interest is focused on the latter: mercy from the psychological dimension. In this discipline there is very little literature related to the subject, although some terms stand out that could be close to mercy, such as benevolence, altruism, solidarity, pro-social behavior, etc., but that do not necessarily represent mercy.

The review of the literature has only allowed us to identify an investigation, carried out by Gartner in 2011, which, among other objectives, was aimed at developing a scale to measure the merciful behavior of a person towards an offender. In this sense, it is more frequent to find studies associated with compassion and piety; two terms that Gonzales de Cardedal (2011) linked to mercy and that have been taken into account for this study.

Regarding compassion, a systematic review study conducted by Estupiñan et al., (2019), points out that the most widely used instrument belongs to Neff's Self-Compassion Scale (Neff, 2003) and its short version the Self-Compassion Scale (Raes et al., 2011). Likewise, other scales stand out, such as the Self-compassion prime (adapted from Rockliff et al., 2011), Compassion Attributes and Actions Scales (Cunha et al., 2017), and the Self-Criticizing and Self Attacking Scale (Gilbert et al., 2004).

One of the latest versions of the compassion scale for adolescents is the Self-Compassion Scale - Youth, which was validated by Neff et al., in 2020, through four studies with different samples of adolescents. At the end, they obtained a two-factor model, the first composed of a self-compassion scale, in general, and the other, represented by a subscale with 6 items. The instrument in its final presentation was made up of 17 items.

Novák et al. (2021) standardized the Santa Clara Brief Compassion Scale, through Confirmatory Factor Analysis, in a Czech population. The authors highlighted that the scale was better adjusted to a unifactorial model with 5 items and 7 response possibilities. In Peru, Caycho et al., (2020) conducted a study with the aforementioned Scale in a sample of 273 university students. From the Confirmatory Factor Analysis, they established that the scale responds better to a unifactorial model.

Asano et al. (2020), in Japan, established the validity and reliability of the Japanese version of the Compassionate Engagement and Action Scale in 279 university students, through the internal consistency method and structure analysis. They determined that of 10 Likert-type items, 6 evaluated commitment and 4 actions of compassion.

In relation to piety, several research studies have been reported in the Asian context. In this regard, Lum et al., (2016) conducted a study with the Contemporary Filial Piety Scale, in a sample of 1,080 older adults living in Hong Kong. From the Confirmatory Factor Analysis, they identified a good fit in a model with two factors and 10 items. They also determined that both factors have reliability indices greater than .84, which implies a good internal consistency to objectively evaluate the referred variable.

Fu et al. (2018) developed a Chinese Elderly Filial Piety Scale made up of 12 items. They worked with a sample of 521 older adults. The Exploratory and Confirmatory Factor Analysis allowed them to find a model of three factors: parental care, family integrity and family aspiration. They also developed internal consistency processes and other forms of validation. The analysis of piety has also been the object of study by Tan et al., (2019), who worked with a sample of adolescents from Malaysia. The study included the translation of a Filial Piety Scale of 16 items and the Exploratory and Confirmatory Factor Analysis, from which they identified the best fit in a model with 2 factors.

Continuing with the Eastern culture, there is a construct very closely related to mercy, called enlightenment, understood as the authentic way of being of an individual. Boyd-Wilson & Walkey (2015) report that it is possible to measure it with an Enlightenment Scale, which has a two-dimensional structure: One called "Peace" and another denominated "Open Heart", with 15 items each. Lingqi et al (2021) validated the Enlightenment Scale in 1111 Chinese students, with a medium to low academic performance level. They identified 3 factors with a good level of adjustment: Open Heart, Fullness and Peace.

Developing a scale to measure mercy becomes relevant due to the implications that the term itself has as an axis for individual and social development. In addition, it could contribute research and knowledge of this human value that is becoming more important every day in a context where loneliness, isolation, individualism, selfishness, etc., have a high presence. Due to the above, it is formulated as a research problem to identify what are the psychometric indicators of a scale elaborated to measure mercy? The general objective is: To identify the psychometric indicators of a scale designed to measure mercy. Likewise, two objectives are proposed: a) to identify the validity indices of the elaborated elements and, b) to identify the specific reliability indices of the Scale.

## METHOD

**Design:** An instrumental quantitative study is formulated using a Likert type format. The psychometric properties of the Mercy Scale are analyzed (Ato et al., 2013; Hernández et al., 2016).

**Participants:** We worked with a sample made up of 284 participants (78 men and 206 women), with some type of religious practice (religious, prayer group, parish group, etc.) aged between 18 and 79 years, 119 participated in organizations of social support and 165 did not. The sample was chosen in an intentional non-probabilistic way.

### **Instruments:**

*Demographic sheet.* A demographic data sheet was prepared to characterize and identify those evaluated. Thus, we inquired about gender, age, religious practice and participation in social support organizations.

*Mercy Scale.* It was prepared according to the structure of the Likert method. The Scale was initially made up of 30 items, which were empirically expected to be grouped into two dimensions: merciful intention and merciful behavior.

The items have five response possibilities, and the examinee must select only one of them. The response categories with scores ranging from 1 to 5 are as follows: "Totally Agree" (5), "Agree" (4), "Neither Agree nor Disagree" (3), "Disagree" (2) and "Totally Disagree" (1). High scores at the individual level or the total sum of items imply high levels of compassion in those evaluated, while low scores do the opposite. The items of the initial version 3, 4, 10 and 24 are considered negative. The reduced version of the Mercy Scale was made up only of positive items.

*Benevolence Dimension of the Colunchi Interpersonal Values Scale* (2018). It was used to determine the convergent validity. It is made up of 4 items (devoting my time to helping others, helping others without any benefit, providing help to those most in need, and offering my friendship to people who have no friends), aimed at measuring "putting oneself in from other people without the need to receive anything in return" (p.14); being a solidarity type value. The range of communalities of the aforementioned items varied between .57 and .58 and the reliability of this factor, obtained by the author through the Omega Coefficient, was .76.

### **Procedure:**

The items were prepared and reviewed by the various members of the team, who made the corresponding reviews for consistency, relevance, and clarity. After that, the scale was passed to google forms format.

The format was structured with three sections, the first was a brief presentation and informed consent; if the evaluated person agreed to participate in the study, they went continued to the next section, otherwise, the system did not allow it. The second section inquired about demographic data, such as sex, age, religious practice and participation or not in social support organizations. In the third section the items were presented. The Scale was anonymous and online.

The various statistical calculations were carried out by using Jamovi 2.3.2 and SPSS v26. Initially, a descriptive analysis of the items was carried out (mean, standard deviation, asymmetry and kurtosis: we worked with the  $\pm 2$  criterion (Bandalos & Finney, 2010). For the analysis of homogeneity of items, those that had an index  $> .30$  were expanded (Correa et al., 2006).

Exploratory Factor Analysis was used to identify the items that would make up the Mercy Scale. Considering the criteria of Londoño et al. (2006), the items that achieved a factorial load greater than 0.30 and those in which the Exploratory Factorial Analysis explained at least 30% of the total variance were considered. Likewise, communalities had to be greater than 0.30 (Child, 2006).

To identify the convergent validity of the Mercy Scale with the Benevolence Dimension of the Colunchi Interpersonal Values Scale (2018), the Pearson correlation coefficient was applied, and the obtained value was interpreted with the criteria proposed by Dominguez (2018): .10 to .29 small, .30 to .49 medium and  $> .50$  large.

Subsequently, with the Confirmatory Factor Analysis. The: chi-square ( $\chi^2/df$ ) goodness-of-fit index was calculated, it is assumed that values less than 3 indicate a good fit (Medrano and Muñoz, 2017). Additionally, the root means square error index (RMSEA,  $\leq .08$ ); the root mean square standardized residual root (SRMR,  $\leq .08$ )-and the comparative fit index (CFI,  $\geq .90$ ): were used to confirm the unifactorial nature of the test. In this regard, Yılmaz, 2018 (as cited in Yucel, et al., 2020) considers CFI values  $> 0.90$  as reasonable indicators of acceptable model fit.

Finally, the reliability of the Scale was estimated using the Omega Coefficient, for which the categories proposed by Viladrich, et al. (2017) were taken into account: acceptable value if it ranges between .70 and .79, good between .80 and .89, and, excellent, in scores greater than or equal to .90. The final version of the Scale was made up of 15 items.

## RESULTS

**Evidence of validity through Exploratory Factor Analysis.** The Mercy Scale initially consisted of 30 items, each with five possible answers, and the respondent had to choose one of them. The tendency of the responses is towards high scores, with the lowest average score being 3.09 and the highest 4.73. On the other hand, a tendency towards normality is observed in the items following the  $\pm 2$  criterion (Bandalos & Finney, 2010).

It is also appreciated, adequate homogeneity indexes in 17 items (23, 26, 5, 27, 22, 15, 21, 11, 19, 25, 2, 6, 8, 30, 9, 1 and 13), whose corrected item-test correlations ( $r_{itc}$ ) were between the range of .50 to .68; exceeding the value of .30, proposed by Correa et al. (2006). Table 1 presents the pertinent information and does not consider item 1 (I feel compassion for those who suffer) and item 13 from the initial version (I feel sorry for the ills of others because I feel them as my own), because they were discarded in the Confirmatory Factor Analysis.

The Exploratory Factor Analysis generated a KMO of .923 and a Chi-Square approximation of 1381.610 (Sig. .000). Pérez & Medrano (2010) argue that a value higher than .70 represents a high significance and leads the KMO to be considered acceptable. On the other hand, Montoya (2007) points out that a value lower than .05, in Bartlett's test of sphericity, leads to rejecting the null hypothesis and accepting the alternative: which in this case states that the variables are correlated in the population. The fulfillment of both conditions allowed the subsequent analysis of the results.



**Table 1**  
*Estimation of descriptive statistics.*

N°	Ítem	Mean	Standard deviation	<i>g1</i>	<i>g2</i>	<i>r<sub>itc</sub></i>
1	Selflessly support those who need it	4,55	,61	-1,56	1,55	,57
2	I am merciful to my neighbor	4,23	,59	-,09	-,42	,64
3	I can deprive myself of something to give it to those who need it	4,07	,73	-,57	,41	,56
4	I am benevolent with those who need it	4,26	,58	-,23	,39	,55
5	I usually feel sorry for the sufferings of others	4,34	,71	-1,26	1,91	,52
6	Would bring comfort to a grieving person	4,53	,52	-,35	-1,39	,60
7	I feel the need to comfort those who suffer	4,07	,78	-1,01	1,93	,61
8	Reason to teach those who do not know	4,27	,60	-,31	,20	,47
9	I include in my plans the voluntary actions for those who need the most	3,86	,81	-,48	-,06	,58
10	I try every day to perform a benevolent action towards the other	3,78	,78	-,41	-,07	,61
11	I promote hope in those who despair in the face of life	4,28	,583	-,13	-,53	,62
12	My actions of helping others are part of my meaning of life	4,21	,720	-,65	,25	,68
13	I do good without looking at who	4,29	,66	-,60	,28	,68
14	I promote charity among people	4,37	,65	-,77	,54	,64
15	I participate in charity activities	3,95	,87	-,63	,09	,55

Note: *g1* = asymmetry; *g2* = kurtosis, *ritc* = corrected item-test correlation

Taking into consideration the Principal Axis Factorization Method with Oblique rotation, it was established that the Mercy Scale should be unidimensional; that is, the 17 items should be grouped into a single factor. As for the discarded items, some statements were oriented to evaluate that one can be taken advantage of, be indifferent to the needs of others, disclose acts of charity, be flattered by acts of mercy, feel pity and forgive.

The only factor obtained reached an initial eigenvalue of 7.38 and the explained variance of 43.38. Subsequent to the application of the Confirmatory Factor Analysis the initial eigenvalue was reduced to 6.76 and the total variance explained increased to 45.04. On the other hand, the factor loadings varied between .55 and .74. (Table 2).

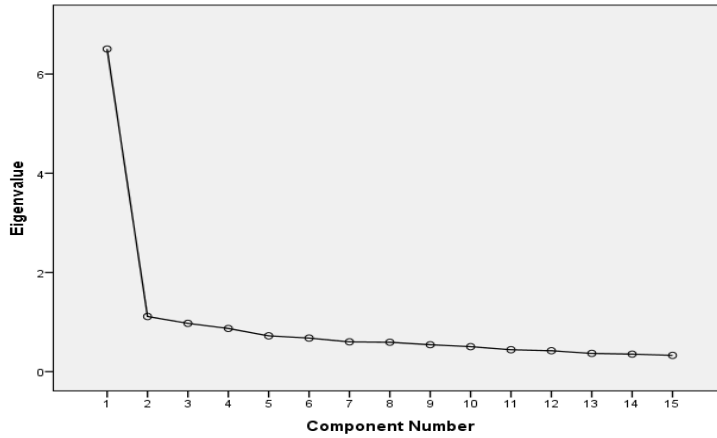
**Table 2**

*Matrix of factor loadings*

Nº	Item	Factor $\lambda$
12	My actions of helping others are part of my meaning of life	.73
2	I am benevolent with those who need it	.60
14	I promote charity among people	.67
7	I am merciful to my neighbor	.70
13	I wish to promote charity among people	.68
1	I promote hope in those who despair in the face of life	.66
11	I feel the need to comfort those who suffer	.68
10	Selflessly support those who need it	.67
15	I can deprive myself of something to give it to those who need it	.63
3	I participate in charity activities	.65
6	I try every day to perform a benevolent action towards the other	.66
9	I include in my plans the voluntary actions for those who need the most	.62
4	Would bring comfort to a grieving person	.63
8	Reason to teach those who do not know	.60
5	I usually fell sorry for the sufferings of others	.59

Extraction Method: Principal Component Analysis      *Note:*  $\lambda$  = Factor Loading

**Figure 1**  
*Graphic distribution of the Mercy Scale Factors.*



The unidimensionality of the Scale can also be verified graphically through figure 1.

**Validity evidence established by Confirmatory Factor Analysis.** A Confirmatory Factor Analysis was performed to validate the unidimensional structure of the Mercy Scale. (Table 3). The fit indices obtained, from the first analysis performed at 17 items, did not reach acceptable values in the CFI = .90 and in the TLI = .88, so the model was respecified, eliminating items 1 and 13 that presented low factor loads and reduced the expected indices. The new model allowed obtaining acceptable fit indices ( $\chi^2 = 183.00$ ,  $df=90$ ,  $\chi^2/df = 2.03$ , CFI = .92, TLI = .90, RMSEA = .07 (RMSEA 90% CI = .056 - .086), SRMR = .05). Finally, the factor loads (Table 2) were higher than the acceptable minimum (> .30, Worthington & Whittaker, 2006).

**Table 3**  
*Goodness-of-fit and reliability indices of the different models*

Models	X2	gl	$\chi^2/df$	CFI	RMSEA	TLI	SRMR	IC
M1	232.00	77	3.01	.90	.08	.88	.05	.07 - .07
M2	183.00	90	2.03	.92	.07	.90	.05	.06 - .09

**Evidence of validity based on another variable.** We proceeded to determine whether or not the mercy and benevolence variables had a normal distribution, for which the Shapiro Wilk statistical test was applied. The results allowed us to establish that the data for both variables do not have a normal distribution (0.001 and 0.023, respectively), so Spearman's Rho statistical test was applied to correlate the scores of both variables. The result leads to the inference that there is a positive relationship, of large magnitude or very strong and high significant between the two variables; therefore, it is confirmed that the Mercy Scale items have adequate validity criteria.

As for the reliability of the Mercy Scale, obtained with McDonald's Omega Coefficient, it was .90. This index is considered excellent (Viladrich et al., 2017), as it represents a  $\omega > .90$ .

## DISCUSSION

The search for literature related to psychometric instruments aimed at measuring mercy, carried out in various databases such as Ebsco, Proquest, Redalyc and even Scopus, among others, has only allowed us to identify a scale of mercy (Gartner, 2011), aimed at identifying a prosocial act or recommending fewer negative consequences or punishment for those who justly deserve it.

Considering the above, the concern arose to design, validate the items and establish the reliability of a scale that allows mercy to be measured, based on a Likert-type design. Although mercy is a term that has a strong link with the Zyzak religion (2015), the intention in this study has been to give it a broader focus: as a human value manifestation acquires relevance and gives meaning to life to those who practice it, especially in a time like the one we are living in there is a need to transcend our own needs to support the needs of others.

Empirically, the starting point was to formulate items aimed at measuring two factors: merciful intention and merciful behavior. 30 items were elaborated, which at first, were reviewed by the researchers in aspects related to relevance, coherence, and clarity.

The Exploratory Factor Analysis led to establish that the Scale reached better metrics when it was analyzed as unifactorial. Thus, it was considered to select only the 17 items with the highest factorial load  $> .30$ , (Londoño et al. 2006). The communality indices were higher than that proposed by Child (2006),  $> .30$ , varying between  $.32$  and  $.54$ . On the other hand, the only component obtained reached a total explained variance of  $43.36$ , which exceeded the index of  $0.30$ , proposed by Londoño et al. (2006).

The discarded items were those that in one way or another were aimed at evaluating aspects related to the recognition of the merciful act, boasting for the activities that were carried out and also situations aimed at forgiveness. Regarding the latter, from a religious perspective, forgiveness can be seen as a merciful act, but from a more psychological perspective, it would respond more to a way of coping and overcoming the negative psychological consequences after having been treated unfairly, as Enright & Fitzgibbons argue. (2015), or conflict management (Wilkowski et al., 2010).

The Confirmatory Factor Analysis after re-specifying a first model and eliminating items 1 and 13, for presenting low factor loadings and reducing the expected indices, allowed obtaining acceptable fit indices ( $\chi^2 = 183.00$ ,  $df = 90$ ,  $\chi^2/df = 2.03$ ,  $CFI = .92$ ,  $TLI = .90$ ,  $RMSEA = .07$  ( $RMSEA\ 90\% \text{ CI} = .056 - .086$ ),  $SRMR = .05$ ). Finally, the factor loads were higher than the acceptable minimum ( $> .30$ , Worthington & Whittaker, 2006).

Regarding the validity obtained through the convergent validity method, based on the correlation of the Mercy Scale and the Benevolence Dimension, of the Colunchi Interpersonal Values Scale (2018), it allowed to establish a positive and highly significant relationship, for which infers that the proposed variable is properly constructed and measures the intended purpose: mercy in those evaluated.

The high reliability indices merely reflect an appropriate consistency of the Mercy Scale to objectively evaluate the proposed variable.

Considering that the present study has been carried out in a time of significant restrictions due to COVID-19, perhaps one of the main limitations of the study has been having to work with a non-probabilistic – intentional sample; fact that led to broaden the age range, to increase participant response. The latter, however, played an important role, because it encourages various psychometric procedures to be carried out (in subgroups according to the characteristics of the sample), which ultimately favored decision-making regarding the items that should make up the final version of the questionnaire. the Scale or those that should be discarded. Condition that consolidated a scale that can be answered by different groups with the characteristics of the worked sample.

Finally, the Mercy Scale, in its final version, has adequate evidence of validity and reliability indices that contribute to its use for research purposes, clinical use or other purposes such as characterization of groups, establishment of baseline, etc.

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