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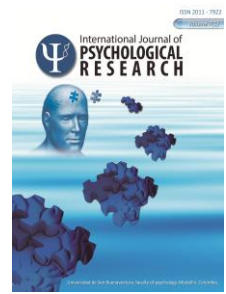
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Evidences of Reliability and Validity of the Dispositional Envy Scale in Argentinian Samples

Evidencias de Validez y Confiabilidad de la Escala de Envidia Disposicional en Muestras de Argentina



Research

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ABSTRACT

The emotional experience of envy goes through different cultures. However, few instruments have been developed for its measurement. Smith et al. (1999) proposed the Dispositional Envy Scale (DES), which has shown good validity properties, stability and internal consistency in psychometric studies conducted with U.S. and Brazilian samples. This research aimed at evaluating the psychometric properties of validity and reliability of the DES with samples of participants from Cordoba, Argentina, university students ($n = 399$) and adults from general population ($n = 316$). Furthermore, the Psychological Entitlement Scale and the Subjective Happiness Scale were applied. Analysis of exploratory and confirmatory factor structure provided evidence about the unidimensionality of the scale. Evidence of adequate internal consistency was obtained. Besides, envy was positively related to entitlement and it was negatively related to subjective happiness.

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RESUMEN

La experiencia emocional de envidia atraviesa distintas culturas. No obstante, son escasos los instrumentos para su medición. Smith et al. (1999) propusieron la Dispositional Envy Scale, la cual ha evidenciado buenas propiedades de validez, estabilidad y consistencia interna en estudios psicométricos conducidos con muestras estadounidenses y brasileras. Esta investigación se propuso evaluar las propiedades psicométricas de validez y confiabilidad con muestras de participantes de Córdoba, Argentina, estudiantes universitarios ($n = 399$) y adultos de población general ($n = 316$). Asimismo, se aplicaron la Psychological Entitlement Scale y la Escala de Felicidad Subjetiva. Análisis de la estructura factorial exploratorios y confirmatorios ofrecieron evidencia sobre la unidimensionalidad de la escala. Se obtuvo evidencia de adecuada consistencia interna. Además, la envidia se relacionó de manera positiva con el derecho psicológico y negativa con la felicidad subjetiva.

Palabras clave:

Escala de Envidia Disposicional; Psicometría; estructural factorial; consistencia interna.

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1. INTRODUCTION¹

The tendency to feel envy is widespread. Recently, empirical studies have shown that most of the people in different cultures seem to be able to feel it (Cohen-Charash & Mueller, 2007; Milfont & Gouveia, 2009; Smith, Parrot, Diener, Hoyle, & Kim, 1999).

To understand how envy appears, an upward social comparison is necessary. This comparison reveals the perception of inferiority of a person in terms of a desired or important attribute, which is owned by another person with similar characteristics. This upward social comparison can lead to lower self-esteem and a sense of inferiority and also can trigger unpleasant feelings stemming from such consciousness of inferiority. Another key aspect of envy is the feeling of injustice that arises when someone who is similar in most respects to the envious person enjoys a significant advantage. When that advantage is considered an unavoidable feeling of misery will appear (Smith et al., 1999).

In different studies, dispositional envy has been assessed by the scale of dispositional envy (Smith et al., 1999) and has been related to variables such as cooperation, perceived injustice and harmful behaviors in social dilemmas and distributional preferences. A study conducted on university students showed that higher scores of envy were associated with lower levels of cooperation (Parks, Rumble, & Posey, 2002). Moreover, Cohen-Charash and Mueller (2007) found that the perception of injustice acts as a mediator of the relationship between envy and harmful behaviors toward the envied person. That is, the relationship between envy and harming behaviors other is positive and significant only when levels of perceived unfairness are high. Meanwhile, Kemp and Bolle (2013), in a study conducted with students from eastern Germany, found no significant relationships between the preferences of monetary distribution and dispositional envy, even most envious participants reported they prefer more equitable distributions.

Milfont and Gouveia (2009), in a study conducted with university students in Brazil, observed that envy is negatively correlated with measures of well-being, life satisfaction and happiness. Whereas

McCullough, Emmons and Tsang (2002) found that U.S. university students who experienced higher levels of dispositional gratitude report less dispositional envy, it is suggested that lower levels of envy are associated with less frustration and resentment about the achievements and possessions of others.

In the studies cited above, the instrument used to measure dispositional envy was the Dispositional Envy Scale (DES) developed by Smith et al. (1999). This instrument is a self-report measure comprising 8 items with a 5-point Likert scale format from 1 (strongly disagree) to 5 (strongly agree). Next, the psychometric properties reported by the authors of the scale are recovered.

Smith et al. (1999) conducted a study with a sample of U.S. students and implemented an instrument with 54 items related to envy. After an exploratory factor analysis with principal axis extraction method the final version of 8 items was obtained. Such unidimensional structure was replicated in exploratory and confirmatory studies with new samples of students. Confirmatory factor analysis with maximum likelihood estimation showed an adequate fit after allowing co-variation of errors of a few variables. Taking into account the covariance allowed, the authors evaluated two additional models. A model comprised two factors which grouped different items (factor 1 = items 4, 7 and 8, factor 2 = items 1, 2, 3, 5 and 6). The fit of this model was good ($\chi^2(19, N = 324) = 81.02, p < .001$; CFI = .94), with factor loadings greater than .60. Moreover, the correlation between factors was .67. Another model included two latent factors, a general factor comprising all items and another unique factor gathering only items 4, 7 and 8. This model showed a good fit ($\chi^2(17, N = 324) = 69.49, p < .001$; CFI = .95), even superior to the model of a factor. Based on these results, the authors conclude that the items of the DES are represented by one latent variable and the subset of three items share an additional source of variation.

The DES has shown adequate reliability properties (Smith et al., 1999). In particular, an adequate stability in the span of two weeks ($r = .80$) and internal consistency (Cronbach's alpha coefficient between .83 and .86 in studies with different samples). In turn, Smith et al. (1999) have reported evidence of convergent and discriminant validity of the DES. Specifically, they have found negative correlations with life satisfaction, resentment, self-esteem, happiness, self-esteem dimension of the Inventory of Texas and jealousy; and positive correlations with the dimension of neuroticism of the NEO-PI and the

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Eysenck Personality Inventory, hostility and various measures of depression. Furthermore, criterion validity evidence has been obtained considering the daily report of envy, moods, different emotional experiences, and feelings of superiority in different domains, and even in situations where the comparison condition was experimentally manipulated, situation in which the participants in the condition of superiority felt more envy than participants in the condition of inferiority.

The psychometric properties of the DES have also been evaluated with samples of participants from other countries. In particular, the study of Milfont and Gouveia (2009) conducted with samples of university students in Brazil stands out. The authors reported good properties of internal consistency (Cronbach's $\alpha = .79$), with a range of item-total correlations of .31-.59. Exploratory and confirmatory analysis of the underlying structure confirmed the unidimensionality of the scale. Exploratory factor analysis showed that the obtained factor explained 43.5% of the total variance. While the confirmatory analysis with maximum likelihood estimation showed an adequate fit of the data to the theoretical model according to several indicators, after allowing several errors, it was shown that they correlate with each other ($\chi^2 (19, N = 102) = 53.97, p < .001$; $\chi^2/df = 2.84$; CFI = .90; RMSEA = .13 (90% CI = .093-.18); SRMR = .080). This study also provided evidence of discriminant validity. DES scores correlated negatively with measures of life satisfaction, vitality and happiness.

A better knowledge of envy would permit to understand behaviors triggered by this emotion in different contexts or settings (eg, labor, educational, economic). However, it is necessary to have measurement instruments with adequate psychometric properties adapted to particular cultural contexts. The DES has shown good validity properties, stability and internal consistency in psychometric studies conducted with U.S. and Brazilian samples. Thus, in this study we aimed at evaluating the psychometric properties of the scale in the local context, in particular, to obtain evidence of internal validity, convergent / discriminant validity and reliability.

2. METHOD

2.1. Participants

The study included two samples: university students and adults from general population. In both cases the sample was self-selected because the guest people decided whether or not to participate in the

study (Sterba & Foster, 2008). The sample of university students was comprised of 399 participants from 18 to 58 years old ($M = 22.78, SD = 4.85$) of both sexes (248 (62.2%) women, 151 (37.8%) men) who were attending different careers at the Universidad Nacional de Córdoba or Universidad Tecnológica Nacional. The general population sample comprised 316 inhabitants of the city of Cordoba from 18 to 65 years old ($M = 32.7, SD = 10.65$) of both sexes (178 (56.3%) women, 138 (43.7%) men), characterized by the following educational levels: 3.5% complete primary, 7.9% incomplete secondary, 19% complete secondary, 9.8% incomplete tertiary, 12.3% complete tertiary, 31% incomplete university, 14.6% complete university, 1.9% post-graduate. Participants received oral and written information about the study objectives. It was emphasized that participation was voluntary and that data would be managed under strict conditions of anonymity and confidentiality.

2.2. Instruments

The Dispositional Envy Scale (Smith et al., 1999) was used, which consists of 8 items that are scored on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). This score was used in the study with university students. Instead, a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree) was used with the general population sample. As noted in the introduction, several studies have shown a unidimensional structure of the scale, with appropriate properties of internal consistency and stability. For this investigation, the English version of the scale was tested in a preliminary study involving the following steps: a) direct translation from English to Spanish by two specialists in English language and comparison of differences; b) pilot study with 15 adults to assess cultural appropriateness, semantic clarity, and grammatical aspects of the items and instructions; c) discussion within the research group on the results of the pilot study. A total score, the sum of the items of the scale, was calculated, with higher scores indicating greater presence of envy. Moreover, the Psychological Entitlement Scale was applied (PES, Campbell, Bonacci, Shelton, Exline, & Bushman, 2004; Mola, Saavedra, Reyna, & Belaus, 2013), which assesses the psychological deserving as a global intrapsychic phenomenon. Studies with samples of participants from Argentina have provided evidence of a factor structure and adequate reliability. Total score was computed as the sum of the items of the scale, where a higher score indicates higher levels of psychological entitlement. The Subjective Happiness Scale was also applied (SHS, Lyubormirsky & Lepper,

1999; Ortiz, Gancedo, & Reyna, 2013) but only in the sample of participants from the general population. This scale assesses happiness as an overall psychological phenomenon, and has demonstrated adequate psychometric properties of validity and reliability in local samples. Total score was computed as the sum of the items of the scale, where a higher score indicates higher subjective happiness. Also, information on socio-demographic data was collected through a questionnaire developed ad-hoc.

2.3. Procedure.

For the collection of data in the sample of university students, the teacher authorization was mandatory. Then, the students were invited to participate in the study, and completed the questionnaires individually. Data collection in the general population sample was conducted through personal invitations in public spaces. After explaining the study objectives and the conditions of participation, information on socio-demographic data were requested. After that, trained research assistants explained how to complete the remaining questionnaires and provided examples, ensuring that the participant had fully understood the task. Finally, participants completed the questionnaires individually, which were subsequently withdrawn. Participation was voluntary, the data were handled under conditions of confidentiality and anonymity, it was explained that the results will only be used for research purposes.

2.4. Data analysis.

Data were analyzed separately for each sample due to singular score format used in each case. Initially, descriptive analysis of variables and cases were performed. Cases with Z values $> \pm 3.29$ were considered univariate outliers, while the multivariate atypicality was assessed at $p < .001$ (Tabachnik & Fidell, 2007). Values of skewness and kurtosis in the range ± 1 were considered excellent, and in the range ± 1.5 were acceptable (George & Mallery, 2001). Then, in the sample of college students, we proceeded to examine the dimensionality of the scale through exploratory and confirmatory analysis, while in the general population sample only a confirmatory analysis was conducted. Extraction method of principal axes was used in the exploratory factor analysis. While maximum likelihood estimation was used in the confirmatory analysis. Different indicators were considered for the assessment of the adjustment: χ^2 , χ^2/df (Kline, 1998), with values less than 3 being indicative of a good fitness; standardized root mean square residual (SRMR, Hu & Bentler,

1999), values close to .08 are considered acceptable and values of .05 indicate a very good fit; Tucker-Lewis index (TLI, Tucker & Lewis, 1973) and comparative fit index (CFI, Bentler, 1990), values below .90 indicate the need to re-specify the model and greater than .95 indicate a good fit; root mean square error of approximation (RMSEA, Steiger, 1990), values less than .05 indicate a good fit, and between .05 and .08 fit is acceptable. Also, standardized regression coefficients were interpreted. Subsequently, for each sample the internal consistency was estimated using Cronbach's alpha coefficient. Finally, the relationship between the total score of envy and the total scores of subjective happiness (only in the sample of college students), and psychological entitlement (in both samples) was evaluated. Data were analyzed with SPSS 20 and AMOS 20.

3. RESULTS

3.1. Sample of university students

Preliminary analysis showed that no variable had more than 5% of missing data. In total, 7 cases had missing data on one or more items. Given the sample size, we choose not to consider such cases for the following analysis. A total of 19 cases showed univariate atypicality and 16 of these cases showed multiple atypicality, which were discarded. Thus, the sample was composed of 376 participants. Regarding skewness and kurtosis, as shown in Table 1, higher values than the acceptable limit were observed for most of the items, a fact that was taken into account in the following analysis.

Before analyzing factorial structure, we divided the sample into two halves at random. Sample 1 ($n = 188$) was used for the exploratory factor analysis (EFA), and sample 2 ($n = 188$) for the confirmatory factor analysis (CFA).

The KMO index was .854, the Bartlett test of sphericity was significant (χ^2 aprox. (28, $n = 188$) = 825.183, $p < .000$), which guaranteed the feasibility of the factor analysis. The Kaiser-Guttman rule suggested the extraction of two factors, while the scree plot suggested the presence of a factor. Based on it, the analysis was repeated extracting a factor. The resulting factor explains 49.66% of the variance after extraction. All items presented factor loadings greater than .40 (see Table 1), and communality values greater than .30. Similar results were observed when using other extraction methods that contemplate non-normality of the items, as the method of weighted least squares.

Subsequently, the items were submitted to a CFA. The initial analysis indicated that χ^2 was significant ($\chi^2(20, n = 188) = 208.468, p < .000$). Based on the modification indices and expected parameter change values provided by the software used, correlations between errors of the indicators were allowed, considering that they were measured with the same instrument. Although the statistical discrepancy remained significant ($\chi^2(12, n = 188) = 25.692, p = .012$), other indices indicated a good fit of the data to the model: $\chi^2/gf = 2.141$; TLI = .954; CFI = .98; RMSEA = .078 (IC 90% .04-.12); SRMR = .042. Finally, the standardized regression coefficients were

evaluated, which were in the range of .431-.862 (see Table 1).

Then, the internal consistency was estimated using the sample of 376 participants through Cronbach's alpha, yielding an appropriate value (.834, See Table 1).

Finally, the relationship between envy and psychological entitlement was evaluated. Only 374 participants completed the two scales that those constructs assess. Correlation analysis showed a positive but weak relationship between the variables ($r = .183, p < .000$).

Table 1. Descriptive statistics for the items of the Dispositional Envy Scale, factor loadings according to different analysis, and Cronbach's alpha if item is deleted - Sample of university students

	M	SD	Skewness	Kurtosis	EFA	CFA	Cronbach's alpha if item is deleted
1. I feel envy every day.	1.31	.56	1.77	2.62	.64	.62	.820
2. The bitter truth is that I generally feel inferior to others.	1.79	1.02	1.09	.12	.56	.43	.806
3. Feelings of envy constantly torment me.	1.26	.53	2.04	3.80	.87	.69	.812
4. It is so frustrating to see some people succeed so easily.	2.11	1.19	.66	-.89	.50	.43	.834
5. No matter what I do, envy always plagues me.	1.22	.49	2.12	3.78	.79	.86	.816
6. I am troubled by feelings of inadequacy.	1.74	1.10	1.34	.64	.56	.46	.810
7. It somehow doesn't seem fair that some people seem to have all the talent.	1.44	.77	1.86	3.07	.77	.65	.809
8. Frankly, the success of my neighbors makes me resent it.	1.26	.56	2.63	8.96	.84	.82	.814

Note. EFA = exploratory factor analysis with axis principal as extraction method; CFA = confirmatory factor analysis.

3.2. General population sample

Preliminary analysis showed that no variable had more than 5% of missing data. In total, 9 cases presented missing data on one or more items that were discarded. A total of 19 cases showed atypicality univariate, and 12 of those cases showed multiple atypicality, we chose not to include those cases in the following analysis. Thus, the sample was composed of 295 participants. Regarding the values of skewness and kurtosis, as shown in Table 2, above the acceptable limit values were observed for most of the

items, a fact that was taken into account in the next analysis.

To analyze the underlying structures a CFA was performed. The initial analysis indicated that the statistical discrepancy was significant ($\chi^2(20, n = 295) = 188.911, p < .000$). The same correlations between variables than those admitted to the sample of university students were admitted. The statistical discrepancy remained significant ($\chi^2(12, n = 295) = 23.057, p = .027$), but other indices indicated a good fit of the data to the model: $\chi^2/gf = 1.921$; TLI = .974; CFI

= .989; RMSEA =.056 (CI 90% .018-.09); SRMR = .029.

Finally, the standardized regression coefficients were evaluated, which were in the range of .332-.835 (see Table 2).

Of the participants included in the previous analysis, 286 completed the PES and SHS, so the analyses of relations among variables were based on that sample. The evaluation of the relation between envy and psychological entitlement showed to be

Then, the internal consistency through Cronbach's alpha coefficient was estimated, and a coefficient of .792 was obtained, which is well considered (see Table 2).

positive and statistically significant ($r = .292, p < .000$). Instead, the relation between envy and subjective happiness was statistically significant in the negative direction ($r = -.427, p < .000$).

Table 2. Descriptive statistics for the items of the Dispositional Envy Scale, factor loadings according to CFA, and Cronbach's alpha if item is deleted - General population sample

	M	SD	Skewness	Kurtosis	CFA	Cronbach's alpha if item is deleted
1. I feel envy every day.	1.47	0.82	2.15	5.04	.79	0.759
2. The bitter truth is that I generally feel inferior to others.	2.08	1.49	1.35	0.91	.50	0.743
3. Feelings of envy constantly torment me.	1.33	0.69	2.62	7.97	.84	0.762
4. It is so frustrating to see some people succeed so easily.	2.69	1.73	0.73	-0.61	.33	0.797
5. No matter what I do, envy always plagues me.	1.27	0.63	2.92	9.70	.87	0.768
6. I am troubled by feelings of inadequacy.	2.12	1.56	1.26	0.49	.42	0.755
7. It somehow doesn't seem fair that some people seem to have all the talent.	1.66	1.19	2.06	4.02	.49	0.779
8. Frankly, the success of my neighbors makes me resent it.	1.29	0.67	2.64	6.81	.58	0.783

Note. CFA = confirmatory factor analysis.

4. DISCUSSION

The present research aimed at examining the psychometric properties of the DES (Smith et al., 1999) in the local context. Samples were made up of university students and adults from the general population of the city of Cordoba. The factor structure was studied in exploratory and confirmatory way, internal consistency was assessed and evidence of convergent / discriminant validity was obtained. In general, evidence of adequate psychometric properties of the DES was obtained.

Factor analysis carried out with the sample of university students suggested the extraction of a single factor that explains 49.66% of the variance. It was found that all items showed factor loadings greater than .40 and communality values greater than

.30. These items were subject to CFA. In that analysis, several indices indicated an inadequate fit of the data to the theoretical model. Thus, it was necessary to allow correlations between the error of the indicators as other authors proceeded (Milfont & Gouveia, 2009; Smith et al., 1999). Although the discrepancy index remained significant, other indices (TLI, CFI, RMSEA, SRMR) indicated an adequate fit. Furthermore, standardized regression coefficients ranged from .33 to .84. The unidimensionality of the scale was confirmed in the study with the general population sample, where the CFA showed similar fit indices than in the case with the sample of university students.

As for the internal consistency, studies with both samples showed evidence of suitable properties, with Cronbach's alpha coefficients around .80. These results are consistent with those observed in the original scale studies conducted with American

samples (Smith et al., 1999), and in the study conducted by Milfont and Gouveia (2009) with a Brazilian sample.

Regarding the assessment of the relation between envy and psychological entitlement, it showed to be positive and statistically significant in the sample of university students and the general population. These results agree with those evidenced by Krizan and Johar (2012), who observed a positive and significant, but weak, relation between psychological entitlement and envy in an American sample. Meanwhile the relation between subjective happiness and envy proved to be significant in the negative direction in the general population sample. These results agree with those reported by Smith et al. (1999) and Milfont and Gouveia (2009).

Although we were able to respond to the the proposed aim, it is necessary to admit certain limitations. First, it is highlighted that the samples were not selected in a probabilistic way, which limits the possibility of generalization of the results to the populations of reference. The use of a self-selected sample was due to the availability of human resources for data collection. Secondly, it is important to consider the possible influence of social desirability in the responses from participants, something that was not controlled in this study. However, Smith et al. (1999) emphasize that while there is a link between social desirability and envy, it has been evidenced that DES is an appropriate measure of dispositional envy. In addition, we note that in this paper the DES was self-administered and applied in group conditions (sample of university students) or individually without the presence of the researcher (sample of general population), whereby it is expected to have lessened the influence of social desirability in the answers of the participants.

Future research should advance the study of other psychometric properties and provide evidence, for example, of convergent/discriminant validity scores obtained with the DES and constructs such as narcissism, life satisfaction, cooperation, gratitude, perceived unfairness. Additionally, it would be positive to obtain evidence of the psychometric properties of the scale in specific contexts such as labor, considering that several authors have emphasized the role of envy in counter-productive behavior among coworkers (Kemp & Bolle, 2013; Khan, Quratulain, & Bell, 2013). In turn, considering the psychosocial characteristics of envy, studies on the relation between it and cooperation could clarify its participation in the choices of the participants in situations of social dilemmas (Parks, Rumble & Posey, 2002).

Finally, considering the contributions of recent research which suggests the existence of two types of envy, benign and malicious (van de Ven, Zeelenberg, & Pieters, 2012), and since some authors postulate differences from envy itself (Smith & Kim, 2007), it would be relevant to investigate the relationship between the scores obtained from the DES and these particular types of envy.

Summarizing, we emphasize that the psychometric studies conducted in this research have provided evidence of adequate properties of the Dispositional Envy Scale, which implies that the scale can be used as a valid and reliable instrument with the population of Cordoba.

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