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Psychometric Properties of the Positivity Scale - Brazilian Version

Propriedades Psicométricas da Versão Brasileira da Escala de Positividade (EP)

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Abstract

This study presents the psychometric properties of the Brazilian version of the Positivity Scale (P-Scale). Participants were 730 subjects (65% women), aged from 17 to 70 years old ($M = 31.0$ years; $SD = 11.43$), from 21 Brazilian states. The sample was randomly split in two halves to cross-validate the results. With the first half of the sample ($n_1 = 365$), an exploratory factor analysis (EFA) was conducted. With the second half of the sample ($n_2 = 365$), a confirmatory factor analysis (CFA) assessed the fit of the exploratory model. Convergent validity and group differences were also evaluated. The EFA and CFA presented a one-dimensional structure for the P-Scale. Moderate correlations were found between the P-Scale and mental-health, subjective happiness and life-satisfaction. The levels of positivity presented a low positive correlation with age, educational level and financial income. Slightly significant effects were found for occupational status and marital status. Positivity appears to be more closely related to personal dispositions than to sociodemographic aspects. Our results suggest that the P-Scale is a reliable measure with which to evaluate the levels of positivity in Brazil.
Keywords: Positivity, scale, translation, adaptation, factor analysis.

Resumo

Este estudo apresenta as propriedades psicométricas da versão brasileira da Escala de Positividade (EP). Participaram 730 sujeitos (65,0% mulheres), com idades entre 17 e 70 anos ($M = 31,0$; $DP = 11,43$) de 21 estados brasileiros. A amostra foi dividida em duas metades para a validação cruzada dos resultados. Com a primeira metade da amostra ($n_1 = 365$), foi conduzida uma análise fatorial exploratória (AFE). Com a segunda metade da amostra ($n_2 = 365$), foi conduzida uma análise fatorial confirmatória (AFC) para avaliar a adequação do modelo exploratório. Validade convergente e diferenças entre grupos também foram avaliadas. A AFE e a AFC indicaram o modelo unidimensional para a EP. Correlações moderadas foram encontradas entre a EP e medidas de saúde mental, felicidade subjetiva e satisfação com a vida. Os níveis de positividade apresentaram correlações positivas fracas com as variáveis idade, nível educacional e renda. Resultados significativos, com baixo tamanho de efeito, foram encontrados nos níveis de positividade em relação a *status* ocupacional e estado civil. A positividade parece estar mais relacionada a disposições pessoais do que com características sociodemográficas. Os resultados sugerem que a EP pode ser uma medida confiável para avaliar os níveis de positividade no Brasil.

Palavras-chave: Positividade, escala, tradução, adaptação, análise fatorial.

The positive features of individual functioning have gained increased attention over recent decades in accordance with a view of well-being as a state in which individuals fully realize their potentials, successfully manage their lives and contribute effectively to their communities (Gable & Haidt, 2005). A number of authors have been engaged in the identification of major determinants and

proper indicators of optimal functioning with the goal of designing effective interventions to enable people to fully express their potentials (Oudou & Vella-Brodrick, 2013; Rashid, 2009). Other researchers, in various ways and under different names, have discussed the concept of a general disposition conducive to addressing experiences with a positive outlook (such as “positive thinking” in Scheier & Carver, 1993, and “positivity” in Diener, Scollon, Oishi, Dzokoto, & Suh, 2000).

Caprara and his colleagues (e.g., Caprara et al., 2009; Caprara & Steca, 2005; Caprara, Steca, Alessandri, Abela,

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& McWhinnie, 2010) focused on what is common to self-esteem, life satisfaction and dispositional optimism. They identified a trait resembling a basic disposition, initially named “positive thinking” (Caprara & Steca, 2005) and later named “positive orientation” (Caprara, Alessandri, Eisenberg, et al., 2012; Caprara, Alessandri, Trommsdorff, et al., 2012). The same common latent structure has been corroborated across different cultures (Caprara, Alessandri, Trommsdorff, et al., 2012) and has been largely attributed to genetic factors (Caprara, 2012). Multivariate genetic analyses revealed high correlations of genetic factors (i.e., the amount of variance two traits share due to the same genetic factors), between .80 and .87, for self-esteem, life satisfaction and optimism, suggesting that a common genetic factor affects all three dimensions (Caprara, 2012). Other findings have shown that positive orientation is a strong predictor of measures related to depression, positive and negative affectivity, quality of friendship, and health. Other findings attest to a positive association of positive orientation with the positive sides of basic personality traits, basic values, psychological well-being, self-efficacy beliefs, resilience, trust and various indicators of health, pro-sociality and adjustment across domains of functioning, such as family, school, work and civic engagement (Alessandri, Caprara, & Tisak, 2012). Negative associations have been found between positive orientation and depression, shyness, hostile rumination, irritability, violence and somatic complaints. Little variance was left to self-esteem, life satisfaction, and optimism after controlling by the levels of positive orientation (Caprara, 2012).

Together, these findings indicate the existence of a basic disposition conducive to a positive appraisal of life and experiences. Positive orientation, or simply “positivity”, is therefore considered a general determinant of subjective well-being. Acting as a dispositional characteristic, positivity explains both individual variation and stability on the levels of subjective well-being, despite environmental changes (Caprara, Alessandri, Eisenberg, et al., 2012; Diener et al., 2000).

Considering the potential benefits that positivity may have in people’s lives, a new measure comprising eight items has been developed to directly assess the construct: the Positivity Scale, or P-Scale (Caprara, Alessandri, Eisenberg, et al., 2012; Caprara, Alessandri, Trommsdorff, et al., 2012). The P-scale aims to evaluate a person’s positive view of his/her self, life and future, as well as confidence related to other people (Caprara, Alessandri, Eisenberg, et al., 2012; Caprara, Alessandri, Trommsdorff, et al., 2012). Several findings attested to the one-dimensionality of positivity and corroborated previous findings regarding its stability, heritability, ecological validity and generalizability across cultures (Alessandri et al., 2012; Caprara, Alessandri, Eisenberg, et al., 2012; Caprara, Alessandri, Trommsdorff, et al., 2012). Considering the relevance of evaluating people’s levels of positivity, this study presents the adaptation process and the psychometric properties of the P-Scale in the Brazilian context.

Method

Translation and Adaptation Processes of the P-Scale

The translation and adaptation process of the original P-Scale to the Brazilian-Portuguese version included several steps, based on the International Test Commission guidelines (ITC, 2010) and on the work of Borsa, Damásio and Bandeira (2012). Initially, two independent translators translated the questionnaire from English to the Brazilian Portuguese. A synthesis of the two versions was then conducted. The synthesized version was evaluated by a target group ($N = 4$) and by a group of three experts in psychometric evaluation. After minor revisions, the adapted version was back-translated from Portuguese to English by a third independent translator. The back-translated version was evaluated by the author of the original P-Scale and was considered both grammatically and semantically equivalent (Annex).

Participants

Participants were a non-probabilistic sample of 730 subjects (65% women), aged from 17 to 70 years old ($M = 31.0$ years; $SD = 11.43$), from 21 Brazilian states. A total of 37% were single, 21.2% were married, 24.2% were dating or engaged, 13.6% were in cohabitation and 4% were divorced.

Several sources were used to recruit subjects: personal and media invitations and the snowball technique (Patton, 1990). Those who decided to participate answered a web-based survey. The free-consent term was added in the first page of the survey so that participants could only advance in the questionnaire by accepting the terms and consenting to participate in the study. Because responses on all items was mandatory, there were no missing answers across all participants. Participants who did not complete the questionnaire (8%) were not considered in the analyses. This project was approved by the Institutional Review Board (Ethics Committee) of the Federal University of Rio Grande do Sul (Brazil; Protocol number: 22240).

Instruments

Sociodemographic Questionnaire. A sociodemographic questionnaire was used to gather information about gender, age, religiosity, educational level, financial income, occupational status (employed, unemployed, or retired) and other factors.

Positivity Scale (P-Scale; Caprara, Alessandri, Eisenberg, et al., 2012). The P-Scale is a questionnaire composed of eight items which evaluate people’s positive view of the self, life and the future, as well as confidence related to other people. The questionnaire uses a Likert scale ranging from 1 (totally disagree) to 5 (totally agree). In the validation study of the P-Scale (Caprara, Alessandri, Eisenberg, et al., 2012), the authors found an adequate reliability index [alpha coefficient = .75; 95% confidence interval (CI): .71-.79]. Further, exploratory factor analysis (EFA) indicated a one-factor solution, and all loadings

were greater than .39 ($M = .55$, $SD = .09$). Confirmatory factor analysis (CFA) also presented adequate fit indexes (Italian sample, $N = 3.589$): CFI = .94; RMSEA (95% CI) = .067; (.067 - .084); SRMR = .039 (Caprara, Alessandri, Eisenberg, et al., 2012).

Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985; Brazilian version adapted by Gouveia, Milfont, Fonseca, & Coelho, 2009). The five items that comprise this instrument evaluate life-satisfaction from a subjective perspective (e.g., “In general, I am satisfied with my life”). In the validation study, the scale presented adequate psychometric properties, reliability index $\alpha = .80$; goodness-of-fit indexes (GFI = .99; NNFI = .98; CFI = .99; RMSEA = .06; SRMR = .02). In this study, the goodness-of-fit indexes of the SWLS were as follow: CFI = 1.00; TLI = 1.00; RMSEA = .01 (.00 - .05); SRMR = .01.

Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999; Brazilian version adapted by Damásio, Zannon, & Koller, 2014). The SHS is a 4-item test that evaluates happiness from the respondent’s own perspective. The instrument has presented excellent psychometric properties in several countries (Moghnie & Kazarian, 2012; Shimai, Otake, Utsuki, Ikemi, & Lyubomirsky, 2004; Spagnoli, Caetano, & Silva, 2012; Swami, 2008; Swami et al., 2009). In the validation study (Lyubomirsky & Lepper, 1999), the authors found an adequate reliability index, with alpha coefficients varying from .80 to .94 in 14 different samples ($N = 2.732$). In this study, the goodness-of-fit indexes of the SHS were as follows: CFI = 1.00; TLI = 1.00; RMSEA (90% CI) = .01 (.000 - .072); SRMR = .02.

Five-item Mental Health Inventory (MHI-5; McHorney & Ware, 1995; Brazilian version adapted by Damásio, Borsa, & Koller, 2014). The MHI-5 is one of the eight independent subscales that comprise the SF-36 (Ware, Snow, Kosinski, & Gandek, 1993). The MHI-5 is composed of five items and evaluates symptoms of depression and anxiety in both clinical and non-clinical populations; it used the five response categories of the SF-36 version 2 (all, most, some, a little, or none of the time). The scores were coded and ranged from 0 to 100. Higher scores indicate better mental health. In this study, the goodness-of-fit indexes of the MHI-5 were as follows: CFI = .99; TLI = .99; RMSEA (90% CI) = .07 (.05 - .11); SRMR = .02.

Data Analysis

Initially, the total sample was randomly split in two halves. An EFA was performed with the first half of the sample ($n_1 = 365$). Considering the ordinal measurement level of the variables and the violation of the assumption of multivariate normality of the data, the analysis was conducted based on a polychoric correlation matrix (Muthén & Muthén, 2010) using the Minimum Rank Factor Analysis (MRFA) extraction method (Shapiro & ten Berge, 2002). The MRFA minimizes the residual common variance in the factor extraction process and enables

the interpretation of the proportion of common variance that is explained by the retained factors (Lorenzo-Seva & Ferrando, 2006). Factor retention criterion was the Hull Method (HM; Lorenzo-Seva, Timmerman, & Kiers, 2011). To date, the HM has proved to be the most reliable factor retention method (Lorenzo-Seva et al., 2011). Sample adequacy was assessed using the Kaiser–Meyer–Olkin (KMO) and Bartlett’s sphericity test. Scale reliability was assessed using Alpha coefficient.

To cross-validate the obtained exploratory factor structure that was obtained, a confirmatory factor analysis (CFA) using the robust maximum likelihood estimation method with correction for data non-normality (Satorra & Bentler, 2001) was then conducted with the second half of the sample ($n_2 = 365$). The fit indexes used were the standardized root mean square residual (SRMR), the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA). According to established guidelines (Brown, 2006; Schreiber, Stage, King, Nora, & Barlow, 2006), the model fit is acceptable if the following values are achieved: SRMR less than .08, CFI and TLI values greater than .90 (preferably greater than .95); and RMSEA values of less than .06 to indicate adequate fit (with its 90% confidence interval not greater than .10).

Convergent validity analyses were performed between the P-Scale and the MHI-5, SWLS, and the SHS using Spearman’s (rho) correlations. Low-to-moderate positive correlations between the P-Scale and all other variables were expected.

To evaluate the levels of positivity in relation to sociodemographic variables, Spearman’s correlations were employed with age, educational level, and financial income. Lastly, a MANOVA evaluated the levels of positivity by gender, marital status (single, dating/engaged, cohabitation, married, and divorced), parenthood (yes/no), religiosity/spirituality (yes/no), and employment (yes, no, or retired).

The MANOVA was performed using bootstrapping (1000 re-samplings; 99% confidence interval for the mean difference, ΔM). Bootstrapping was used to achieve greater reliability, to correct the non-normal distribution of the sample and the difference in group sizes and to present a confidence interval of 99% for the mean differences (Haukoos & Lewis, 2005).

Results

Exploratory Factor Analysis

The EFA (KMO = .84; Bartlett’s test of sphericity $\chi^2 [28] = 1368.7$, $p < .001$) performed with the first half of the sample ($n_1 = 365$) presented a single-factor solution, which accounted for 52% of the explained variance of the construct. All eight items loaded on the first factor with satisfactory factor loadings ($\geq .36$; Table 1).

Table 1
Exploratory Factor Analysis of the Brazilian Version of the Positivity Scale (P-Scale)

	Factor Loadings
	P-Scale
Item 1	.70
Item 2	.45
Item 3	.80
Item 4	-.36
Item 5	.67
Item 6	.77
Item 7	.77
Item 8	.88
Eigenvalue	4.16
Explained Variance	52%
Mean (SD)	30.15 (4.94)
Alpha Reliability	.86

Confirmatory Factor Analysis

A CFA was performed with the second half of the sample ($n_2 = 365$) to cross-validate the exploratory model. An adequate fit was achieved: $\chi^2 (df) = 113.98 (20)$, $p < .001$; SRMR = .065; CFI = .95; TLI = .93; RMSEA = .11 (.09-.13). Factor loadings were as follows: Item 1 = .66, Item 2 = .33, Item 3 = .69, Item 4 = .42, Item 5 = .74, Item 6 = .79, Item 7 = .74, Item 8 = .80. Although the goodness-of-fit was acceptable for the majority of the indicators, the RMSEA value was higher than the commonly acceptable value (.10). A modification indexes analysis showed that three error terms were significantly increasing the chi-square value, and consequently increasing the RMSEA. In order of importance, the error correlations were Error 1 (“I have great faith in the future”) and Error 6 (“At times, the future seems unclear to me”), $M. I = 70.176$, $p < .001$; Error 8 (“I generally feel confident in myself”) and Error 3 (“Others are generally here for me when I need them”), $M. I = 54.528$; and Error 8 (“I generally feel confident in myself”) and Error 1 (“I have great faith in the future”), $M. I = 23.391$, $p < .001$. When applying these modifications, the model presented excellent fit indexes: $\chi^2 (df) = 37.63 (17)$, $p < .01$; SRMR = .045; TLI = .99; CFI = .98; RMSEA = .058 (.033 - .083).

Convergent Validity

Convergent validity was conducted by employing the P-Scale and other correlated measures. As expected, the P-Scale correlated positively with MHI-5 ($r = .56$), SHS ($r = .62$) and SWLS ($r = .68$).

Table 2
Spearman’s Correlations among P-Scale, MHI-5, SHS and SWLS

Constructs	P-Scale	MHI-5	SHS	SWLS
Positivity Scale (P-Scale)	-			
Five-item Mental Health Inventory (MHI-5)	.56	-		
Subjective Happiness Scale (SHS)	.62	.63	-	
Satisfaction with Life Scale (SWLS)	.68	.57	.62	-

Note. All correlation significant at level $p < .001$.

Positive Index and Sociodemographic Variables

The levels of positivity presented slightly positive correlations with age ($r = .13$, $p < .001$), educational level ($r = .15$, $p < .001$), and financial income ($r = .11$, $p < .001$).

No significant differences were found for gender [$F(1, 670) = .215$, $p = .64$], parenthood [$F(1, 670) = .242$, $p = .62$], or religiosity/spirituality [$F(1, 670) = .808$, $p = .37$].

Slightly significant effects were found for employment [$F(2, 670) = 3.287$, $p < .05$; $\eta^2 = .01$] and for marital status [$F(4, 670) = 3.873$, $p < .01$; $\eta^2 = .02$]. Employed people

presented higher levels ($M = 30.46$; 95% CI = 29.76 – 31.15; $SE = .35$) when compared to the unemployed ($M = 28.32$; 95% CI = 26.83 – 29.80; $SE = .76$). No significant differences were found among the retired ($M = 30.19$; 95% CI = 27.19 – 33.20; $SE = 1.53$) compared to the other categories. Married participants presented higher levels ($M = 31.33$; 95% CI = 29.99 – 32.67; $SE = .68$) when compared to the single ($M = 27.75$; 95% CI = 26.47 – 29.04; $SE = .65$) and dating or engaging ($M = 30.23$; 95% CI = 28.93 – 31.53; $SE = .66$). Divorced ($M = 29.34$; 95% CI

= 26.82 – 31.86; $SE = 1.28$) and cohabiting ($M = 30.15$; 95% $CI = 28.59 – 31.71$; $SE = .79$) presented no significant differences compared with any other group.

Discussion

This study provided empirical evidence of construct validity and reliability for the Brazilian version of the P-Scale. As expected, a single-factor solution was achieved in the EFA and corroborated in the CFA, with all items loading satisfactorily in the dimension. The goodness-of-fit of the CFA was adequate; however, the modification index showed that the correlations of three error terms would increase model fit. All of these items are related to positive expectations about the future (optimism), and these results likely suggest an overlap in content among these items (Brown, 2006). It is important to note that the most important error correlation ($E1 \leftrightarrow E6$) found in this study was also encountered in Caprara, Alessandri, Eisenberg, et al. (2012). Future studies should evaluate the possibility of refining the P-Scale by reducing the number of items that evaluate optimism.

Moderate correlations were found between the P-Scale and all other measures. The levels of mental health, as measured by the MHI-5, reflect symptoms of both anxiety and depression. Life satisfaction and subjective happiness, in turn, are the subjective perception of well-being: people evaluate their lives through their own perspectives (Diener et al., 1985; Lyubomirsky & Lepper, 1999).

These constructs correspond to positive feelings, cognitions, and actions and have been highly correlated with one another and with a number of outcomes that reflect individual well-being, such as health, job success, and positive interpersonal relationships (Caprara, Alessandri, Eisenberg, et al., 2012; Caprara, Alessandri, Trommsdorff, et al., 2012). The moderate correlations were expected because the P-Scale explicitly encompasses items of self-esteem, perceived social support, optimism, and life satisfaction. The convergent validity presented in this study corroborates several studies (Caprara, Alessandri, Eisenberg, et al., 2012; Caprara, Alessandri, Trommsdorff, et al., 2012; Caprara & Steca, 2005; Caprara et al., 2010) that argued that the aforementioned positive constructs might be grouped by a common factor, titled positivity, which explains, to a large extent, the variability in the individual's evaluations of self, life, and future (Diener et al., 2000). This assumption has been tested in several countries (e.g., Italy, Germany, and Japan), strengthening an initial hypothesis that positivity may be a worldwide construct (Caprara, Alessandri, Trommsdorff, et al., 2012).

The effects of sociodemographic variables were almost negligible. Low positive correlations were found with age, educational level, and financial income. The highest correlation (age, $r = .15$) presented only 2.25% (r^2) of shared variance with the P-Scale. No significant differences were found by sex, fatherhood, or religiosity/spirituality, and the significant differences found among marital status and em-

ployment had very low effect sizes. These results are in line with those presented by Caprara, Alessandri, Trommsdorff, et al. (2012), in which the authors found non-significant correlations between the P-Scale scores and subject's sex, SES, and age. These results indicate that positivity may be more related to personality characteristics than external (in this case, sociodemographic) indicators.

These findings relate to the discussion about to what degree a human's "positive" characteristics are better explained by personality dispositions versus sociodemographic variables and the contextual contingencies an individual develops. Although not evaluated in this study, this assumption held true elsewhere (Caprara, Alessandri, Trommsdorff, et al., 2012), where the P-Scale showed higher positive correlations with personality traits (big-five approach) than with sociodemographic characteristics.

Positivity is a relatively new construct in the field of Positive Psychology. However, the number of studies published on the topic shows that positivity is an important variable that explains both the individual's perception of life as a whole and the covariance among several positive indicators of human well-being (e.g., self-esteem, optimism, life satisfaction, etc.).

We have provided initial evidence that the concept of Positivity may also hold true in the Brazilian context. The psychometric properties and validity evidence of the Brazilian P-Scale were adequately achieved. It is important to note that data collection was conducted exclusively via an online survey tool. Although several empirical studies suggest that online surveys present no bias when compared to offline collection procedures (e.g., Buchanann, 2001; van Gelder, Bretveld, & Roeleveld, 2010), this study could have also been conducted with an offline sample for possible comparative analysis. Future studies including a larger and more diverse sample, employing online and offline data collection procedures, and including clinical and non-clinical participants are welcome. Longitudinal studies associating the P-Scale with personality traits and a large set of sociodemographic and contextual variables would also help to clarify to what extent positivity is, in fact, a relatively stable personality disposition.

Conclusion

The present article presented the translation and adaptation process of the P-Scale (Caprara, Alessandri, Eisenberg, et al., 2012; Caprara, Alessandri, Trommsdorff, et al., 2012) for the Brazilian Portuguese. The results indicate that the P-Scale can be applied to the Brazilian context.

Researchers working in Positive Psychology and related areas may benefit from the P-Scale once adequate content, criterion and construct validity are confirmed. Moreover, the P-scale is a useful measure for various settings: as a screening instrument, positivity can be used to contrast with a variety of psychological dysfunctions, and it can also represent positive psychological functioning (Caprara, Alessandri, Eisenberg, et al., 2012; Caprara,

Alessandri, Trommsdorff, et al., 2012). We hope that this newly developed measure can both foster Positive Psychology studies in the Brazilian context and contribute to the comprehension and promotion of positive aspects of human development.

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Annex

Escala de Positividade (EP)

Instruções: As sentenças de 1 a 8 descrevem afirmações com as quais você pode ou não concordar. Marque o quanto você concorda com cada uma das informações a seguir, em uma escala de 1 (Discordo Fortemente) a 5 (Concordo Fortemente), colocando um X sobre o número correspondente à sua opinião. Leia atentamente as informações e procure responder com a máxima espontaneidade. Não existem respostas certas ou erradas.

1	2	3	4	5
Discordo fortemente	Discordo	Nem concordo, nem discordo	Concordo	Concordo fortemente

1. Eu tenho muita confiança no futuro	1	2	3	4	5
2. Posso contar com outras pessoas quando preciso delas	1	2	3	4	5
3. Eu estou satisfeito(a) com a minha vida	1	2	3	4	5
4. Algumas vezes, o futuro parece incerto para mim	1	2	3	4	5
5. Eu geralmente sinto confiança em mim mesmo(a)	1	2	3	4	5
6. Eu vejo o futuro com esperança e entusiasmo	1	2	3	4	5
7. Eu sinto que tenho muitas coisas das quais me orgulhar	1	2	3	4	5
8. No geral, eu estou satisfeito(a) comigo mesmo(a)	1	2	3	4	5