Translation and validation for the Portuguese adult population of the Persistent and Intrusive Negative Thoughts Scale: Assessing measurement invariance

Maria Manuela Peixoto¹ & Olga Cunha²

¹ Psychology for Positive Development Research Center (CIPD), Universidade Lusíada, Porto, Portugal

² HEI-Lab: Digital Human-Environment Interaction Lab, Universidade Lusófona do Porto, Porto, Portugal.

Correspondence concerning this article should be addressed to:

Maria Manuela Peixoto

Centro de Investigação em Psicologia para o Desenvolvimento Positivo, Instituto de Psicologia e Ciências da Educação, Universidade Lusíada-Norte, Rua Dr. Lopo de Carvalho, 4369 – 006, Porto, Portugal

E-mail: mmpeixoto@por.ulusiada.pt

Conflict of Interest: The authors declare that they have no conflict of interest.

Abstract

Repetitive Negative Thinking (RNT) is a transdiagnostic construct associated with a variety of emotional disorders. To date, disorder-specific self-report measures have been found to capture specific types of RNT. The Persistent and Intrusive Negative Thoughts Scale (PINTS) is a 5-item measure developed to overcome current limitations. The current study aims to translate and validate the PINTS for the Portuguese population. An online sample consisting of 432 participants (213 men, 219 women) completed the PINTS and a series of related self-report measures. Confirmatory factor analysis revealed that the one-factor model fit the Portuguese version and supported the proposed factorial structure. Reliability analyses showed good internal consistency and excellent temporal stability. Convergent and criterion validity results also showed good values. Overall, the Portuguese version of the PINTS proved to be a brief and reliable measure for assessing persistent and intrusive negative thoughts, and its use in clinical and research contexts is recommended.

Keywords: confirmatory analysis; intrusive thoughts; measurement invariance; persistent thoughts; repetitive negative thinking

Introduction

According to Ehring et al. (2011), Repetitive Negative Thinking (RNT) is a thinking style that is strongly associated with emotional disturbance and relates to past, present, and/or future problems or to past and/or anticipated negative experiences. Additionally, this thinking style is characterized by being repetitive, partially intrusive, difficult to resolve, and leads to dysfunctional effects (Ehring et al., 2011). Therefore, RNT has been described as a transdiagnostic construct involved in the onset, development, and/or maintenance of a range of disorders, particularly affective and emotional disorders (e.g., major depression, anxiety disorders, bipolar disorder, obsessive-compulsive and related disorders; Arditte et al., 2016; Ehring & Watkins, 2008; McEvoy et al., 2013; Wahl et al., 2019).

Previous research on RNT has focused on cognitive constructs in disorder-specific forms, such as rumination in the context of depressive disorders and worry within anxiety disorders (e.g., Hur et al., 2017; McEvoy & Brans, 2013; Watkins, Molds, & Mackintosh, 2005). More specifically, worry is one form of RNT identified as a core feature in Generalized Anxiety Disorder (GAD; APA; 2013), whereas rumination is another form of RNT empirically recognized as a vulnerability factor for depressive disorders (e.g., Nolen-Hoeksema et al., 2008). Although slight differences have been described between rumination and worry, mainly related to thought content and time orientation, with rumination characterized by past negative thoughts and worry describing thoughts about upcoming potential negative outcomes, both constructs are highly correlated and comorbid (Ehring & Watkins, 2008; Hur et al., 2017; Watkins et al., 2005). Furthermore, a direct comparison between worry and ruminative thoughts found more similarities than differences (Arditte et al., 2016; Drost et al., 2014; Watkins et al., 2005).

Comorbidity in mental disorders is widespread and is known to negatively impact quality of life and well-being, and significantly impair the functional domains of those affected (Gonzalez-Robles et al., 2018). In recent decades, researchers and clinicians have made considerable efforts to better understand the cognitive processes involved in the high rates of comorbidity of affective and emotional disorders. These processes, recognized as transdiagnostic constructs, are implicated in the etiology and onset of certain emotional disorders (e.g., rumination as a risk factor for depressive disorders) and play a key role in certain emotional disorders (e.g., worry as a core feature in GAD; Arditte et al., 2016; Ehring & Watkins, 2008; Wahl et al., 2019). Nonetheless, transdiagnostic constructs are also shared by several other emotional disorders, e.g., rumination as a cognitive process that frequently occurs in social anxiety disorder after the patient has been exposed to an anxiety-related episode (Arditte et al., 2016; Ehring & Watkins, 2008; Wahl et al., 2019).

The Perseverative Thinking Questionnaire (PTQ) was developed by Ehring et al. (2011) to assess RNT and is a self-report measure consisting of 15 items assessing three factors: core features of RNT (intrusive, repetitive, and difficult to disengage); unproductive perceptions of RNT; and capturing mental capacity of RNT. Despite the psychometric properties suggesting the PTQ as a valid and reliable measure to assess RNT, the PTQ subscales showed high intercorrelations, suggesting that RNT can be assessed using a single-factor measure (Magson et al., 2019). According to McEvoy et al. (2014), the need for short, reliable, and validated self-report measures is primarily related to the urgency of minimizing the burden on both the therapist and the patient associated with administering multiple measures to assess major and comorbidity diagnoses. Additionally, shorter measures are recommended for longitudinal and epidemiological studies (Magson et al., 2019). Furthermore, despite specific measures

of disturbance for RNT (e.g., Penn State Worry Questionnaire; Meyer et al., 1999), there are fewer neutral measures of disturbance for this transdiagnostic process (e.g., PTQ; Ehring et al., 2011) and for the adult population. Therefore, Magson et al. (2019) developed a five-item self-report measure to assess RNT, the Persistent and Intrusive Negative Thoughts Scale (PINTS), for children, adolescents, and adults.

The PINTS is a brief, valid, and reliable self-report measure developed to capture a thinking style characterized by persistent thoughts that are also intrusive and negative (Magson et al., 2019). The five items allow capturing the RNT characteristics proposed by Ehring et al. (2011), specifically the core characteristics of repetitive, intrusive, and having difficulty disengaging from these thoughts, as well as unproductive cognition of RNT. Unlike the PTQ, this specific scale allows assessment of RNT using a single-factor model. However, due to its novelty, validation studies have only been conducted with community samples (Magson et al., 2019). Previously, individuals who score higher on scales assessing symptomatology of emotional disturbance have also reported more RNT (Magson et al., 2019).

In the Portuguese context, emotional disorders are very widespread (Antunes et al., 2018; WHO, 2017), which negatively affects the public mental health system and the quality of life of the population, leading to a high prevalence of the use of psychotropic drugs use (Perelman et al., 2018). The PTQ was translated and validated for the Portuguese population (Azevedo et al., 2017; Chaves et al., 2013), but failed to replicate the three-factor model of the original version (Ehring et al., 2011), suggesting a two-factor model (i.e., repetitive thoughts; and cognitive interference and unproductivity; Azevedo et al., 2017; Chaves et al., 2013). Considering the advantages of the PINTS and the limitations related to the Portuguese version of the PTQ, our main goal was to translate and validate the PINTS for the Portuguese adult population

(PINTS-PT). This study aims to examine the if a single-factor model proposed by Magson et al. (2019) for PINTS fits the Portuguese version of the instrument, and to explore the psychometric properties of the PINTS-PT, by examining internal consistency and temporal stability, as well as convergent and criterion validity, by examining the correlation between PINTS-PT and rumination, depression, generalized anxiety, social anxiety, and life satisfaction. In addition, this study aims to explore the invariance of the PINTS-PT across gender and psychiatric history. With this study, we expect to make available to researchers, clinicians, and academics a new instrument to assess RNT in a short time, with good psychometric properties and according to a one-factor model, and gender invariant. The PINTS-PT will provide a brief self-report measure that will mitigate the burden on Portuguese psychotherapists and patients during clinical assessments, as well as the burden on Portuguese clinical researchers in longitudinal and epidemiological.

Materials and Methods

Participants

The sample is composed of a total of 432 Portuguese adults (49.3% men, $n = 213$) who participated in the study. The age of the participants ranged from 18 to 73 years ($M_{age} = 35.66$, $SD = 10.71$). The majority of the sample had 13 or more years of schooling (60.9%, $n = 263$), were single (51.4%, $n = 222$), had a middle socioeconomic status (63.2%, $n = 273$), and lived in an urban area (79.4%, $n = 343$). Most participants reported having no clinical diagnosis (79.6%, $n = 344$), not taking medication (81.5%, $n = 352$), and having no current (100%) or past (50.7%, $n = 219$) psychological or psychiatric treatment. Detailed sociodemographic characteristics are presented in Table 1.

[INSERT HERE TABLE 1]

Procedures

The PINTS was translated from English into Portuguese by two researchers Portuguese native speakers and proficient in English and then back-translated from Portuguese into English by two independent researchers, Portuguese native speakers and proficient in English. Inconsistencies were revised until no semantic differences were found between the English and Portuguese versions of PINTS. This version was then tested in a group of Portuguese adults to ensure that the individuals fully understood the present version of the PINTS. As the results of the pilot study were satisfactory, no further changes were made to the PINTS.

The final version of the PINTS and the other instruments were added to the Google Forms platform. The link to complete the questionnaires was distributed via email and social networking sites (e.g., Facebook, LinkedIn). Individuals over the age of 18 were invited to participate in a 10- to 12-minute survey. All participants were informed of the voluntary and anonymous nature of the study and signed an online consent form. There was no financial support, compensation, or incentives for participation in the study. All ethical standards and procedures established by Portuguese legislation were met, and ethical approval was granted by the University XX.

Measures

The Persistent and Intrusive Negative Thoughts Scale (PINTS; Magson et al., 2019) is a disorder-neutral five-item questionnaire to assess the three core characteristics of maladaptive repetitive negative thought, as proposed by Ehling et al., (2011): a) repetitive; b) intrusive; and c) difficult to disengage from. Items are rated on a 5-point Likert scale from 1 (*never*) to 5 (*almost always*). Scores were computed as a sum, and scores range from 5 to 25. Research found that the PINTS have good internal

consistency ($\alpha = .91$), and test-retest reliability ($r = .78$), and criterion validity (Magson et al., 2019). Confirmatory factor analysis revealed that the model provided a good fit to the data.

The Ruminative Response Scale – 10 (RRS-10; Treynor et al., 2003) consists of 10 items from the original Response Styles Questionnaire (RSQ; Nolen-Hoeksema & Morrow, 1991). Each item is scored on a 4-point Likert scale, ranging from 1 (*almost never*) to 4 (*almost always*). Scores were computed as sum, with scores ranging from 10 to 40. The short version is highly correlated to the original version of the scale ($r = .90$) and has good internal reliability (.85). The Portuguese version of the RRS-10 also reached good values of internal consistency (.75 and .76), test-retest ($r = .75$ to .79), and convergent and divergent validity (Dinis et al., 2011). The reliability of the scale in the current study was good ($\alpha = .80$).

The Depression, Anxiety and Stress Scale – 21 (DASS-21; Henry & Crawford, 2005) is a 21-item scale composed by three subscales: depression; anxiety; and stress. This scale measures depression, anxiety, and stress over the past two weeks on a scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much or most of the time*). Total scores were computed as sum, and ranging from 0 to 63. DASS-21 revealed good reliability and construct validity. The Portuguese version of the scale also revealed good internal consistency ($\alpha = .85$; Pais-Ribeiro, Honrado, & Leal, 2004). The internal consistency for the present sample was excellent ($\alpha = .95$).

The Generalized Anxiety Disorder – 7 (GAD-7; Spitzer et al., 2006) is a self-report measure for the screening, diagnosis, and assessment of symptom severity in generalized anxiety disorder. Individuals are asked to rate how often they have been bothered by each of the seven symptoms over the past 2 weeks on a scale from 0 (*not at all*) to 3 (*nearly every day*). Total score was computed as sum, and scores ranging from

0 to 21. GAD-7 revealed an excellent internal consistency ($\alpha = .92$) and test-retest reliability (ICC = .83; Spitzer et al., 2006). The Portuguese version of GAD-7 also reached good internal consistency values ($\alpha = .89$), test-retest reliability and construct validity (Sousa et al., 2015). The reliability estimate of the GAD-7 in the current study was high ($\alpha = .92$).

The Social Phobia Scale (SPS; Mattick & Clarke, 1998) is a 20-item self-report measure designed to assesses anxiety in situations involving observation by others. Individuals are asked to indicate the degree to which they feel the statement is characteristic or true of him/her on a five-point Likert scale from 0 (*not at all*) to 4 (*extremely*). Total score was computed as a sum, and scores range from 0 to 80. Both the original version and the Portuguese version of SPS revealed good internal reliability and test-retest reliability (Mattick & Clarke, 1998; Pinto-Gouveia & Salvador, 2001). The SPS had good internal consistency in the current study ($\alpha = .91$).

The Satisfaction with Life Scale (SWLS; Diener et al., 1985) is a five-item self-report measure that assesses global life satisfaction on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). The total score was computed as a sum, and scores range from 5 to 40. The scale has demonstrated good psychometric properties (Diener et al., 1985). Also, the Portuguese version of SWLS revealed good internal consistency (Simões, 1992). The internal consistency in the current study was good ($\alpha = .75$).

Data analysis

To analyse if the PINTS structure fit to the data a confirmatory Factor Analysis (CFA) using the software AMOS 25 was conducted. To assess the adjustment quality the following indexes were used: a) X^2/df (ratio of chi-square on degrees of freedom) inferior to 2.0; b) TLI (Tucker-Lewis Index) and CFI (Comparative Fit Index) superior to .90; c) RMSEA (Root Mean Square Error of Approximation) inferior to 0.10; and d)

AIC (Akaike Information Criterion) that has no reference value, but the lower, the better (Marôco, 2014). The invariance of the factorial model across gender and clinical/psychiatric diagnosis was assessed through a Multigroup Confirmatory Factor Analysis (MCFA) using software AMOS 25. Measurement invariance was analysed by testing configural, metric, and scalar invariance (To assess the instrument invariance the Δ CFI was used since it is not affected by the model specification and its value should be smaller or equal to 0.01 (Cheung & Rensvold, 2002).

All the following procedures were performed on data analysis software IBM SPSS 27. The construct validity was assessed testing the Pearson Correlation Coefficient between PINTS and total scores of RRS-10, DASS-21, GAD-7, SPS and SWLS. Construct validity was also assessed through the Extracted Average Variance (VME; $\geq .50$) and Composite Reliability (CR; $\geq .70$; Netemeyer et al., 2003). Internal reliability was assessed through the Cronbach's Alpha ($\geq .70$) and Omega Coefficient ($\geq .70$; cf. Dunn, Baguley, & Brunsden, 2014). Test-retest reliability was assessed through Pearson correlation Coefficient and the Intraclass Correlation Coefficient ($\geq .75$; cf. Koo & Li, 2017).

Results

Preliminary analyses

The PINTS did not contain missing values or outliers. There was no evidence of kurtosis (-.652 to -.214) or skewness (-.201 to -.037) because all values fell within the acceptable range of ± 2 (Gravetter & Wallnau, 2014). Because the data were deemed normally distributed, all the analyses were conducted using parametric statistics.

Confirmatory factor analysis

The PINTS' one-factor structure was tested through Confirmatory Factor Analysis (CFA). Based on the analysis of the goodness of fit indices the one-factor

model shows evidence of satisfactory adjustment: $X^2/df = 3.723$, CFI = .99, TLI = .98, RMSEA = .079 [.034-.132], AIC = 45.170. All the items' factors loadings are higher than .50 (see Table 2).

[INSERT HERE TABLE 2]

Reliability

The Cronbach's alpha value of .88 indicated that the five-item PINTS had good internal consistency. All the PINTS items were well correlated ($r_s = .388$ to $.727$; see Table 3), and the item-total coefficients suggested that the deletion of any of the items would not significantly improve the reliability of the scale. Coefficient omega also indicated that the PINTS had good composite reliability ($\omega = .89$).

Twenty participants were retested 4 weeks after the initial testing to establish the test-retest reliability of the PINTS scale. Results showed test-retest correlation for the PINTS mean score was positive and significant and demonstrated good test-retest reliability ($r = .86$; $p < .001$). The intraclass correlation coefficient estimate and the corresponding 95% confidence intervals were also calculated using the two-way mixed effects model with a single measure (ICC). Results indicated that the level of absolute agreement between the two-time waves was excellent (ICC = .93; 95% CI [.82, .97]).

[INSERT HERE TABLE 3]

Convergent and criterion validity

To assess the convergent and criterion validity of the PINTS, Pearson coefficient correlations between the PINTS and rumination, depression, generalized anxiety, social anxiety, and life satisfaction were performed. As shown in Table 4, the PINTS was significantly associated with rumination, symptoms of depression, generalized anxiety, social anxiety, and low life satisfaction.

The Average Variance Extracted (AVE) and the Composite Reliability (CR) were estimated to better explore the construct validity. The AVE was satisfactory (.62; $\geq .50$ cf. Netemeyer et al., 2003) and the CR was above the recommended values (.89; $\geq .70$; cf. Netemeyer et al., 2003).

[INSERT HERE TABLE 4]

Invariance of the factor structure between samples

Means and standard-deviations of PINTS score for male and female samples, and for with and without clinical diagnosis samples were reported, and differences between samples were computed (Table 5).

[INSERT HERE TABLE 5]

PINTS measurement invariance was tested across gender and psychiatric history (Table 6). The one-factor model showed a good adjustment to male and female individuals simultaneously ($X^2/df = 3.681$; RMSEA = .079; CFI = .99; TLI = .96), revealing configural invariance. The ΔX^2 and the ΔCFI revealed metric ($\Delta X^2 (4) = 5.531, p = .023$) and scalar invariance ($\Delta X^2 (9) = 18.021, p = .035$). The model also revealed an acceptable fit both to individuals with and without psychiatric history ($X^2/df = 2.170$; RMSEA = .052; CFI = .99; TLI = .98), showing configural invariance. Results also revealed metric ($\Delta X^2 (4) = 14.930, p = .005$) and scalar invariance ($\Delta X^2 (9) = 45.780, p < .001$). These overall results corroborate the presence of measurement invariance across sample.

[INSERT HERE TABLE 6]

Discussion

The PINTS was developed to overcome limitations associated with the RNT assessment (Magson et al., 2019; McEvoey et al., 2014), by allowing to rapidly evaluate a transdiagnostic construct associated with the onset, development, and/or maintenance

of a range of emotional disorders (Arditte et al., 2016; Ehring & Watkins, 2008; McEvoy et al., 2013; Topper et al., 2010; Wahl, 2019). The current study aimed to translate and validate the PINTS to the Portuguese adult population. The main results showed that the Portuguese adult version of the PINTS is a brief, valid, and reliable self-report measure that clinicians and researchers are encouraged to use.

Confirmatory factor analysis replicated the single-factor model proposed by Magson et al. (2019), which corroborated the data from the original version of the PINTS and supported the proposal to capture RNT with a single-factor measure (Magson et al., 2019). The goodness-of-fit indices showed good to excellent scores, with the exception of the RMSEA score, which showed an acceptable value (.08; Awang, 2012). In addition, the data from the original version of PINTS showed a poor goodness-of-fit value for RMSEA ($rmsea = .098$; Magson et al., 2019). Factor loadings for each of the five items yielded values ranging from .559 to .877, showing a similar pattern to the original version, with the item "*I lay awake at night thinking about things*" having the lowest factor loading. A possible explanation may be related to the interpretation of the item, which may lead to the idea of being awake all night thinking about things. It is possible that persistent and repetitive negative thinking may be associated with early insomnia or later insomnia, but not strongly related to severe insomnia.

In terms of reliability, the results of this study replicated the results of the original study by showing that the PINTS has good internal consistency as measured by Cronbach alpha and McDonald omega (Green & Yang, 2015; Peters, 2014). Furthermore, test-retest correlation analyses revealed that the measure is stable over time, confirming the results of the original study (Magson et al., 2019).

As expected, the results of convergent and criterion validity showed that the PINTS was significantly, positively, and moderately correlated with the constructs of rumination and worry, with symptoms of depression, anxiety, stress, generalized anxiety, and social anxiety. Previous research has shown that RNT is a transdiagnostic construct involved in emotional disorders such as generalized anxiety disorder, social anxiety, or major depression and is highly correlated with other transdiagnostic constructs such as worry and rumination (Arditte et al., 2016; Ehring & Watkins, 2008; McEvoy et al., 2013; Wahl, 2019). Furthermore, PINTS was significantly, negatively, and moderately correlated with life satisfaction, supporting the idea of an intrusive, repetitive, and negative thinking style as a burden on mental health and quality of life (Perelman et al., 2018). Interestingly, the current study found a stronger correlation between PINTS-PT and life satisfaction, by showing that Portuguese individuals who exhibited higher levels of persistent and repetitive negative thinking style, perceived greater impairment in their lives than individuals from the original study.

In terms of measurement invariance, the PINTS showed measurement invariance across gender and psychiatric history, suggesting that the one-factor model has a good fit in female and male samples and in individuals with and without a psychiatric history of emotional disturbance. The original version of the PINTS has also revealed gender measurement invariance (Magson et al., 2019). To date, no studies have examined measurement invariance across psychiatric history. Our results suggest, that regardless of gender and of clinically experiencing emotional disturbance at a clinical level, the PINTS proves to be a brief, valid and reliable measure for capturing and assessing persistent and intrusive negative thoughts.

Nevertheless, the current study has some limitations that should be considered. The validation process of the PINTS was conducted with an adult sample, and data from

children and adolescents have not yet been collected. Future studies should consider collecting a sample of children and adolescents and test the psychometric properties of the PINTS and measurement invariance across age. The psychiatric history of the sample was self-report, and all measures were self-report; therefore, no clinical assessment or diagnosis was guided by a health professional, and no clinical judgment was assessed. In addition, some individuals who did not report current clinical diagnosis, reported taking psychiatric medication, which may interfere with results. Future research should examine the psychometric properties, model fit, and measurement invariance with clinical populations, with individuals before and after psychotherapeutic interventions to test how the PINTS works.

Emotional disorders, such as mood and anxiety disorders, are highly prevalent in the Portuguese context (Antunes et al., 2018; WHO, 2017), with a negative burden on the mental health system, quality of life and population well-being (Perelman et al., 2018). Brief and reliable measures are recommended for clinical screening contexts and for research purposes, as are neutral disturbance measures for assessing transdiagnostic processes such as RNT (Magson et al., 2019). Overall, the current study provided empirical evidence for a new, short, valid, and reliable instrument to assess RNT, for the Portuguese population.

References

- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th Edition). Arlington, VA: Author.
- Antunes, A., Frasilho, D., Azeredo-Lopes, S., Neto, D., Silva, M., Cardoso, G., et al. (2018). Disability and common mental disorders: Results from the World Mental Health Survey Initiative Portugal. *European Psychiatry*, 49, 56-61.
<http://dx.doi.org/10.1016/j.eurpsy.2017.12.004>

- Awang, Z. H. (2012). *A Handbook on SEM: Structural Equation Modeling* (4th ed.).
Kualalumpur: Centre for Graduate Studies, University Teknologi MARA
Kelantan.
- Azevedo, J., Pereira, A. T., Amaral, A. P., Nogueira, V., Soares, M. J., Mota, D., et al.
(2017). Perseverative Thinking Questionnaire: Confirmatory factor analysis with
two different samples. *European Psychiatry*, 41, S377-S378.
<https://doi.org/10.1016/j.eurpsy.2017.02.401>
- Arditte, K. A., Swaw, A. M., & Timpano, K. R. (2016). Repetitive negative thinking: A
transdiagnostic correlate of affective disorders. *Journal of Social and Clinical
Psychology*, 35(3), 181-201. <https://doi.org/10.1521/jscp.2016.35.3.181>
- Chaves, B., Pereira, A. T., Castro, J., Soares, M. J., Amaral, A. P., Bos, S., et al.
(2013). Perseverative thinking questionnaire: validation of the Portuguese version.
Atencion Primaria, 45:162.
- Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for
testing measurement invariance. *Structural Equation Modeling*, 9(2), 233–
255. https://doi.org/10.1207/S15328007SEM0902_5
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction with
Life Scale. *Journal of Personality Assessment*, 49(1), 71-75.
https://doi.org/10.1207/s15327752jpa4901_13
- Dinis, A., Pinto-Gouveia, J., Duarte, C., & Castro, T. (2011). Estudo de validação da
versão portuguesa da Escala de Respostas Ruminativas – Versão Reduzida.
Psychologica, 54, 175-202. https://doi.org/10.14195/1647-8606_54_7
- Drost, J., van der Does, W., van Hemert, A.M, Penninx, B.W., S&pinhoven, P. (2014).
Repetitive negative thinking as a transdiagnostic factor in depression and anxiety:

A conceptual replication. *Behaviour Research and Therapy*, 63, 177-183.

<https://doi.org/10.1016/j.brat.2014.06.004>

Dunn, T., Baguley, T., & Brunsden, V. (2014). From alpha to omega: A practical solution to the pervasive problem of internal consistency estimation. *British Journal of Psychology*, 105, 399-412. <https://doi.org/10.1111/bjop.12046>

Ehring, T. & Watkins, E. R. (2008). Repetitive negative thinking as a transdiagnostic process. *International Journal of Cognitive Therapy*, 1(3), 192-205. <https://doi.org/10.1680/ijct.2008.1.3.192>

Ehring, T., Zetche, U., Weidacker, K., Schonfeld, S., & Ehlers, A. (2011). The Perseverative Thinking Questionnaire (PTQ): Validation of a content-independent measure of repetitive negative thinking. *Journal of Behavior Therapy and Experimental Psychiatry*, 42(2), 225-232. <https://doi.org/10.1016/j.jbtep.2010.12.003>

Erdur-Baker, O. & Bugay, A. (2010). The short version of ruminative response scale: reliability, validity and its relation to psychological symptoms. *Procedia Social and Behavioral Sciences*, 5, 2178-2181. <https://doi.org/10.1016/j.sbspro.2010.07.433>

Gonzalez-Robles, A., Díaz-García, A., Miguel, C., García-Palacios, A., & Botella, C. (2018) Comorbidity and diagnosis distribution in transdiagnostic treatments for emotional disorders: A systematic review of randomized controlled trials. *PLoS ONE*, 13(11), e0207396. <https://doi.org/10.1371/journal.pone.0207396>

Gravetter, F., & Wallnau, L. (2014). *Essentials of statistics for the behavioral sciences* (8th ed.). Belmont, CA: Wadsworth.

Green, S. B. & Yang, Y. (2015). Evaluation of Dimensionality in the Assessment of Internal Consistency Reliability: Coefficient Alpha and Omega Coefficients.

Educational Assessment: Issues and Practice, 34(4), 14-20.

<https://doi.org/10.1111/emip.12100>

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British Journal of Clinical Psychology*, 44(Pt2), 227–239. <https://doi.org/10.1348/014466505X29657>

Horn, J., & McArdle, J. (1992). A practical and theoretical guide to measurement invariance in aging research. *Experimental Aging Research*, 18(3), 117–144. <https://doi.org/10.1080/03610739208253916>

Hur, J., Heller, W., Kern, J. L., & Berenbaum, H. (2017). A bi-factor approach to modeling the structure of worry and rumination. *Journal of Experimental Psychopathology*, 8(3), 252-264. <https://doi.org/10.5127/jep.057116>

Koo, T. K., & Li, M. Y. (2016). A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *Journal of Chiropractic Medicine*, 15(2), 155-163. <https://doi.org/10.1016/j.jcm.2016.02.012>

Lovibond, P., & Lovibond, S. (1995). The structure of negative emotional states: Comparison of the depression anxiety stress scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, 33(3), 335-343. [https://doi.org/10.1016/0005-7967\(94\)00075-U](https://doi.org/10.1016/0005-7967(94)00075-U)

Magson, N. R., Rapee, R. M., Fardouly, J., Forbes, M. K., Richardson, C. E., Johnco, C. J., et al. (2019). Measuring repetitive negative thinking: Development and validation of the Persistent and Intrusive Negative Thoughts Scale (PINTS). *Psychological Assessment*, 31(11), 1329-1339. <https://doi.org/10.1037/pas0000755>

- Marôco, J. (2014). *Análise de equações estruturais. Fundamentos teóricos. Software & aplicaciones*. Pero Pinheiro: Report Number.
- Mattick, R. P. & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behavior Research and Therapy*, 36(4), 455-470. [https://doi.org/10.1016/S0005-7967\(97\)10031-6](https://doi.org/10.1016/S0005-7967(97)10031-6)
- McEvoy, P. M., & Brans, S. (2013). Common versus unique variance across measures of worry and rumination: Predictive utility and mediational models for anxiety and depression. *Cognitive Therapy and Research*, 37, 183-196. <https://doi.org/10.1007/s10608-012-9448-5>
- McEvoy, P. M., Thibodeau, M. A., & Asmundson, G. J. G. (2014). Trait repetitive negative thinking: A brief transdiagnostic assessment. *Journal of Experimental Psychopathology*, 5(3), 1-17. <https://doi.org/10.5127/jep.037813>
- McEvoy, P. M., Watson, H., Watkins, E. R., & Nathan, P. (2013). The relationship between worry, rumination, and comorbidity: Evidence for repetitive negative thinking as a transdiagnostic construct. *Journal of Affective Disorders*, 151(1), 313-320. <https://doi.org/10.1016/j.jad.2013.06.014>
- Meyer, T. J., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State Worry Questionnaire. *Behaviour Research and Therapy*, 28(6), 487-495. [https://doi.org/10.1016/0005-7967\(90\)90135-6](https://doi.org/10.1016/0005-7967(90)90135-6)
- Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications*. Thousand Oaks, CA: Sage.
- Nolen-Hoeksema, S., & Morrow, J. (1991). A prospective study of depression and posttraumatic stress symptoms after a natural disaster: The 1989 Loma Prieta Earthquake. *Journal of Personality and Social Psychology*, 61(1), 115–121. <http://dx.doi.org/10.1037/0022-3514.61.1.115>

Nolen-Hoeksema, S., Wisco, B.E., & Lyubomirsky, S. (2008). Rethinking rumination.

Perspectives on Psychological Science, 3(5), 400-424.

<http://dx.doi.org/10.1111/j.1745-6924.2008.00088.x>

Pais-Ribeiro, J. L., Honrado, A., & Leal, I. (2004). Contribuição para o estudo da

adaptação portuguesa das escalas de ansiedade, depressão e stress de 21 itens de

Lovibond e Lovibond. *Psicologia, Saúde & Doenças*, 5, 229-239.

Perelman, J., Chaves, P., de Almeida, J. M. C., & Matias, M. A. (2018). Reforming the

Portuguese mental health system: an incentive-based approach. *International*

Journal of Mental Health Systems, 12, 25. [https://doi.org/10.1186/s13033-018-](https://doi.org/10.1186/s13033-018-0204-4)

0204-4

Peters, G.-J. Y. (2014). The alpha and the omega of scale reliability and validity: Why

and how to abandon Cronbach's alpha and the route towards more comprehensive

assessment of scale quality. *European Health Psychologist*, 16(2), 56-69.

<https://doi.org/10.3124/osf.io/h47fv>

Pinto-Gouveia, J., & Salvador, M. C. (2001). The social interaction anxiety scale and

the social phobia scale in the Portuguese population. Paper presented at the XXXI

Annual Congress of European Association for Behavioural and Cognitive

Therapies, Istanbul – Turkey.

Simões, A. (1992). Ulterior validação de uma escala de satisfação com a vida (SWLS).

Revista Portuguesa de Pedagogia, 3, 503-515.

Sousa, T. V., Viveiros, V., Chai, M. V., Vicente, F. L., Jesus, G., Carnot, M. J., et al.

(2015). Reliability and validity of the Portuguese version of the Generalized

Anxiety Disorder (GAD-7) scale. *Health and Quality of Life Outcomes*, 13, 50.

<https://doi.org/10.1186/s12955-015-0244-2>

- Spitzer, R. L., Kroenke, K., Williams, J. B. & Lowe, B. (2006). A brief measure for assessing Generalized Anxiety Disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092-1097. <https://doi.org/10.1001/archinte.166.10.1092>
- Treynor, W., Gonzalez, R., & Nolen-Hoeksema, S. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research*, 27(3), 247–259. <https://doi.org/10.1023/A:1023910315561>
- Wahl, K., Ehrling, T., Kley, H., Lieb, R., Meyer, A., Kordon, A., et al. (2019). Is repetitive negative thinking a transdiagnostic process? A comparison of key processes of RNT in depression, generalized anxiety disorder, obsessive-compulsive disorder, and community controls. *Journal of Behavior Therapy and Experimental Psychiatry*, 64, 45-53. <https://doi.org/10.1016/j.jbtep.2019.02.006>.
- Watkins, E., Moulds, M., & Mackintosh, B. (2005). Comparisons between rumination and worry in a non-clinical population. *Behaviour Research and Therapy*, 43(12), 1577-1585. <https://doi.org/10.1016/j.brat.2004.11.008>
- World Health Organization (2017). *Depression and Other Common Mental Disorders: Global Health Estimates*. Geneva.

Table 1

Sociodemographic Characterization

	N	%
Sex		
<i>Male</i>	213	49.3
<i>Female</i>	219	50.7
Educational Level		
<i>4 years</i>	1	0.2
<i>6 years</i>	1	0.2
<i>9 years</i>	128	29.6
<i>12 years</i>	39	9
<i>13 years or more</i>	263	60.9
Marital status		
<i>Single</i>	222	51.4
<i>Married/in cohabitation</i>	176	40.7
<i>Divorced/separated</i>	32	7.4
<i>Widower</i>	2	0.5
Socioeconomic level		
<i>Low</i>	11	2.5
<i>Medium-Low</i>	79	18.3
<i>Medium</i>	273	63.2
<i>Medium-High</i>	65	15
<i>High</i>	4	0.9
Residence area		
<i>Urban</i>	343	79.4
<i>Rural</i>	89	20.6
Clinical diagnosis		
<i>No diagnosis</i>	344	79.6
<i>Depression</i>	30	6.9
<i>Anxiety</i>	14	3.2
<i>Depression and anxiety</i>	35	8.1
<i>Other</i>	9	2.1
Current medication		
<i>No medication</i>	352	81.5
<i>Antidepressants</i>	20	4.6
<i>Anxiolytics</i>	45	10.4
<i>Antidepressants and Anxiolytics</i>	11	2.5
<i>Antipsychotics or other</i>	4	0.9
Past Psychological/Psychiatric treatment		
<i>No</i>	219	50.7
<i>Yes</i>	213	49.3

Table 2

Standardized Factorial Loadings of the PINTS

Items	Loadings
I lay awake at night thinking about things.	.559
When I have a problem, I can't get it out of my head.	.824
When something upsets me, I think about it over and over.	.877
I get stuck thinking about things.	.813
When something difficult is coming up, I keep thinking about it all of the time.	.831

Note. PINTS – Persistent and Intrusive Negative Thoughts Scale.

Table 3

Correlations between PINTS items.

Items	1	2	3	4	5
I lay awake at night thinking about things.	1				
When I have a problem, I can't get it out of my head.	.526***	1			
When something upsets me, I think about it over and over.	.478***	.720***	1		
I get stuck thinking about things.	.482***	.642***	.727***	1	
When something difficult is coming up, I keep thinking about it all of the time.	.388***	.702***	.718***	.647***	1

Note. *** $p < .001$; PINTS – Persistent and Intrusive Negative Thoughts Scale.

Table 4.

Correlations between PINTS, RRS-10, DASS-21, GAD-7, SPS, and SWLS.

	1	2	3	4	5	6
1. PINTS	1					
2. RRS-10	.51***	1				
3. DASS-21	.51***	.62***	1			
4. GAD-7	.52***	.58***	.82***	1		
5. SPS	.47***	.46***	.61***	.55***	1	
6. SWLS	-.54***	-.33***	-.39***	-.41***	-.36***	1

Note. *** $p < .001$; PINTS – Persistent and Intrusive Negative Thoughts Scale, RRS-10 – Ruminative Response Scale - 10, DASS-21 – Depression, Anxiety and Stress Scale - 21, GAD-7 – Generalized Anxiety Disorder - 7, SPS – Social Phobia Scale, and SWLS – Satisfaction with Life Scale.

Table 5

PINTS scores and differences across gender and psychiatric history

	Gender		Differences	Psychiatric history		Differences
	Male	Female	between	No clinical diagnosis	Clinical diagnosis	between
	(n = 213)	(n = 219)	groups	(n = 344)	(n = 88)	groups
	<i>M(SD)</i>	<i>M(SD)</i>	<i>t</i> (430) <i>p-value</i>	<i>M(SD)</i>	<i>M(SD)</i>	<i>t</i> (430) <i>p-value</i>
PINTS	15.77 (3.95)	16.30 (3.82)	-1.40, <i>p</i> = .163	15.54 (3.84)	18.01 (3.43)	-5.51, <i>p</i> < .001

Note: PINTS – Persistent and Intrusive Negative Thoughts Scale.

Table 6.

Tests of Measurement Invariance of the PINTS

		X²	df	RMSEA	CFI	TLI	ΔCFI
Gender	Configural	22.088	6	.079 [.045-.115]	.99	.96	—
	invariance						
	Metric invariance	27.619	10	.064 [.036-.093]	.99	.97	.01
	Scalar invariance	40.109	15	.062 [.039-.086]	.98	.97	.01
Clinical diagnosis	Configural	13.019	6	.052 [.009-.091]	.99	.98	—
	invariance						
	Metric invariance	27.949	10	.065 [.037-.094]	.99	.97	.01
	Scalar invariance	40.109	15	.082 [.061-.105]	.98	.97	.01

Note: PINTS – Persistent and Intrusive Negative Thoughts Scale. χ^2 – Chi-Square; df – degrees of freedom; CFI - Comparative Fit Index; TLI - Tucker-Lewis Index; RMSEA - Root Mean Square Error of Approximation.