Psychometric properties of the spanish version of The Distress Tolerance Scale and its relationship with personality and psychopathological symptoms

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Abstract

Background: Distress tolerance is defined as the individual's capacity to experience and withstand negative psychological states. The goal of this study was to examine the psychometric properties and the factor structure of the Spanish version of the Distress Tolerance Scale (DTS) and to test its relationship with psychopathological symptoms and personality. **Method:** A sample of 650 participants completed the DTS, the Eysenck Personality Questionnaire Revised–Abbreviated) (EPQR-A), and the Symptom Assessment-45 Questionnaire (SA-45). **Results:** The DTS showed good internal consistency (Cronbach's alpha) and adequate temporal stability (7-month test-retest). Results of a confirmatory factor analysis supported the hypothesized 4-factor structure (tolerance, appraisal, absorption, and regulation) that load onto a higher-order general factor. A structural equation model (SEM) was tested to provide evidence of construct validity. Neuroticism was inversely associated with distress tolerance, and distress tolerance partially mediated the effects of neuroticism on current symptoms. Results indicated that the Spanish DTS mediated associations between personality traits and current psychiatric symptoms. **Conclusions:** Results support the use of this version as a useful tool for assessing distress tolerance in clinical and research settings in Spanish-speaking countries. In addition, we found that distress tolerance may form a link between neuroticism and psychopathology.

Keywords: Distress tolerance, Spanish Distress Tolerance Scale, personality, neuroticism; psychopathological symptoms.

Resumen

Propiedades psicométricas de la versión española y relación con la personalidad y los síntomas psicopatológicos de la Escala de Tolerancia al Estrés. **Antecedentes:** la tolerancia al estrés es la capacidad que tiene el individuo para soportar los estados psicológicos negativos. El objetivo del presente estudio consistió en examinar las propiedades psicométricas y la estructura factorial de la versión española de la Distress Tolerance Scale (DTS) y probar su relación con los síntomas psicopatológicos y la personalidad. **Método:** se utilizó una muestra de 650 participantes que cumplimentó el DTS, el Eysenck Personality Questionnaire Revised-Abbreviated) (EPQR-A) y el Symptom Assessment-45 Questionnaire (SA-45). **Resultados:** la DTS resultó tener buena consistencia interna (alfa de Cronbach) y adecuada estabilidad temporal (test-retest 7 meses). Los resultados del análisis factorial confirmatorio apoyan la estructura hipotetizada de 4 factores (tolerancia, evaluación, absorción y regulación) que saturan en un factor general superior. Tras aplicar un modelo de ecuaciones estructurales se constató que el neuroticismo se asociaba de forma inversa con la tolerancia al estrés, actuando esta como factor mediador entre los efectos del neuroticismo sobre los síntomas psicopatológicos. **Conclusiones:** los resultados apoyan la adecuación de la Spanish DTS para evaluar la tolerancia al estrés en población de habla española. Asimismo, los datos sugieren que la tolerancia al estrés actúa como mediador del efecto del neuroticismo sobre los síntomas psicopatológicos.

Palabras clave: tolerancia al estrés, Spanish Distress Tolerance Scale, personalidad, neuroticismo, síntomas psicopatológicos.

The concept of distress tolerance has been a focus of increased interest in clinical psychology research during the past decade. It refers to an individual's capacity to experience and withstand negative psychological states (Simons & Gaher, 2005). This construct appears to be conceptually different from other related concepts, such as emotional avoidance, anxiety sensitivity, emotion regulation, avoidant coping, and tolerance of ambiguity (see Leyro, Zvolensky, & Bernstein, 2010, for a review).

Current research suggests that distress tolerance may be conceptualized as an individual difference variable that contributes to development and/or maintenance of several manifestations of psychopathology, including borderline personality disorder (Gaher, Hofman, Simons, & Hunsaker, 2013; Kiselica & Bornovalova; Simons & Gaher, 2005), alcohol and substance use-related problems (Howell, Leyro, Hogan, Buckner, & Zvolensky, 2010), cannabis use related problems (Bujarski, Norberg, & Copeland, 2012), anxiety and depressive symptoms (Bernstein, Marshall, & Zvolensky, 2011; Keough, Riccardi, Timpano, Mitchell, & Schmidt, 2010), eating disorders (Raykos, Byrne, & Watson, 2009), bulimic symptoms and other impulsive behaviors (Anestis et al., 2012),

and posttraumatic stress disorder symptom severity (Marshall-Berenz, Vujanovic, Bonn-Miller, Bernstein, & Zvolensky, 2010). Accordingly, distress tolerance could be understood as a transdiagnostic marker of a wide spectrum of mental symptoms and disorders similar to other well-established transdiagnostic constructs (Barajas, 2015; Sandín, Chorot, & Valiente, 2012; Sandín, Sánchez-Arribas, Chorot, & Valiente, 2015).

According to Simons and Gaher (2005), distress tolerance may be considered as a dispositional variable related to evaluations and expectations of experiencing negative emotional states concerning (a) perceived tolerability and severity of distress, (b) appraisal of distress and concomitant self-evaluation, (c) tendency to absorb attention (e.g., one's experience of negative emotions is related to disrupted functioning) and (d) emotional regulation (e.g., low distress tolerance is associated with great efforts to avoid negative emotions). Thus, individuals with low distress tolerance are more likely to perceive distress as unbearable, unacceptable, and uncontrollable, and to be overly reactive to stress and distress.

Based on this theory-driven approach, Simons and Gaher (2005) developed the Distress Tolerance Scale (DTS), a 15-item self-report measure which, accordingly, taps the four basic components of distress tolerance, i.e., tolerance, appraisal, absorption, and regulation. Using exploratory and confirmatory factor analyses, the authors found a general distress tolerance factor (a second-order factor) and four first-order factors that represent the four conceptual dimensions of the distress tolerance construct. Simons and Gaher also provided evidence on reliability and convergent and discriminant validity of the scale. For example, they found good internal consistency both for the second-order factor (α's $\geq$ .82) and for the first-order factors (α's $\geq$ .70), as well good temporal stability (6-month interval intra-class $r = .61$, for the second order scale).

Overall, research using the DTS tends to support significant associations between distress tolerance and a number of features and symptoms of mental disorders. In addition, some recent studies have found that the DTS may work better than other current measures of distress tolerance. Marshall-Berenz et al. (2010) investigated the relations between measures of perceived distress tolerance (i.e., the DTS and the Discomfort Intolerance Scale-DIS; Schmidt, Richey, & Fitzpatrick, 2006) and behavioral distress tolerance (mirror-tracing and breath-holding tasks) and post-traumatic stress disorder (PTSD) symptom severity within a trauma-exposed community. The authors found that DTS but no other measures of distress tolerance were significantly related to PTSD symptom severity above and beyond the variance accounted for by number of traumas, trait-level neuroticism, and participant sex. Bernstein et al. (2011) also conducted a multi-method study to investigate differential associations between distinct self-report and behavioral measures of distress tolerance (DTS, DIS, mirror-tracing, breath-holding, and CO$_2$-enriched air tolerance tasks) and mood and anxiety psychopathology and quality of life. They concluded that only the DTS was significantly related to the outcome measures (lower levels of perceived tolerance of emotional distress were related to mood and anxiety disorder diagnostic status, greater levels of co/multi-morbidity, and poorer quality of life), evidencing transdiagnostic relationships to psychopathology and quality of life.

The DTS appears to emerge as a gold-standard measure of great value as a transdiagnostic tool for research and clinical purposes. It is apparent from the previous research that the DTS has good empirical properties. However, it is important to validate the DTS in languages other than English in order to support cross-cultural uses of the scale both for clinical and theoretical purposes. So, the primary goal of the present study was to examine the factor structure and psychometric properties (evidence of reliability and convergent and discriminant validity) of the Spanish version of the DTS in a Spanish sample, providing evidence for cross-cultural validation of the scale. The DTS has been translated into several languages, including Persian (Azizi, 2010) and French (Wagener & Blairy, 2015). However, as far as we know, it has not been adapted to be used in Spanish-speaking countries yet. Consistent with the previous validation study (Simons & Gaher, 2005), it was predicted that the DTS would consist of four first-order factors (tolerance, appraisal, absorption, and regulation), which are indicators of a single second-order general distress tolerance factor. We also hypothesized that these factors would demonstrate good reliability (internal consistence and temporal stability) and evidence of convergent (positive associations with close constructs) and discriminant (negative or null associations with distant constructs) validity.

Neuroticism is a personality trait of general vulnerability to experiencing negative emotional states (Costa & McCrae, 1980; Eysenck, 1967), especially symptoms and disorders of depression and anxiety (Widiger & Trull, 1992), and has been suggested as a predisposing factor vulnerability to distress and distress tolerance (Leyro et al., 2010; Marshall-Berenz et al., 2010). Likewise, preliminary evidence suggests that distress tolerance could be a mediator of the relationship between neuroticism and symptoms of anxiety and depression (Leyro et al., 2010). Thus, a second main purpose of the study was to examine the association between distress tolerance and neuroticism, as well as to extend current research on relationship between distress tolerance and psychopathological symptoms. In this respect, we hypothesized that neuroticism should be negatively associated with distress tolerance and positively with current psychiatric symptoms and, in addition, distress tolerance should negatively mediate the effect of neuroticism on psychiatric symptoms. In contrast with neuroticism, extraversion has been negatively linked to vulnerability to stress (Eysenck, 1967); further, consistent with past research on negative relationships between positive affect/extraversion and distress tolerance with symptoms of anxiety and depression (Brown & Barlow, 2009; Watson, 2009; Wray, Simons, Dvorak, & Gaher, 2012), we also hypothesized an inverse association between extraversion and psychopathological symptoms via distress tolerance, though this effect was expected to be weaker than for neuroticism. In contrast, because psychoticism is a less theoretical related construct with distress than neuroticismo and extraversion (Eysenck & Eysenck, 1976; Watson, 2009), the personality trait of psychoticism was not expected to be significantly associated with distress tolerance.

Method

Participants

The sample consisted of 650 psychology university students (71% females) from first and second year and recruited from the Universidad Nacional de Educación a Distancia (Spain), from seventeen Spanish regions (see Table 1). Participants ranged in age from 19 to 63 years ($M = 34.4$, $SD = 9.5$). The majority of the

participants were white (approximately 90%), with the remainder being Hispanic and Black. Concerning the marital status of the sample, 61.2% of the participants were single/never married, 31.5% were married, and 7.3% were separated/divorced or widow/er.

Procedures performed in the study were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants included in the study.

Instruments

Distress Tolerance Scale (DTS) (Simons & Gaher, 2005). The DTS is a 15-item self-report scale designed to assess the degree to which individuals experience and withstand distressing psychological states. Participants rate the items on a 5-point scale ranging from *strongly agree* (1) to *strongly disagree* (5), with lower scores indicating a greater ability to tolerate distress. In addition to a total score, the DTS includes four subscales related to (1) perceived ability to tolerate emotional distress (Tolerance (3 items); e.g., "Feeling distressed or upset is unbearable to me"), (2) subjective appraisal of distress (Appraisal (6 items); e.g., "My feelings of distress of being upset are not acceptable"), (3) attention absorbed by negative emotions (Absorption (3 items); e.g., When I feel distressed or upset, all I can think about is how bad I feel"), and (4) regulation efforts to alleviate distress (Regulation (3 items); e.g., "I'll do anything to stop feeling distressed or upset"). In the present study we used a Spanish version of the scale. The DTS was adapted to Spanish (see Table 5) using a back translation method and structured guidelines (Geisinger, 1994). First, it was independently translated from English to Spanish by three of the authors, and they determined by consensus a final version of the scale based on the tree drafts. Second, this version was then back-translated by a native English-speaking clinical psychologist. Third, the back-translated version was reviewed by the two original developers of the scale. No major discrepancies were detected in the back-translation procedure.

Eysenck Personality Questionnaire Revised-Abbreviated) (EPQR-A) (Francis, Brown, & Philipchalk (1992). The EPQR-A is an abbreviated form of the Eysenck Personality Questionnaire. It is a 24-item self-report measure that taps three personality scales (extraversion, neuroticism, and psychoticism) and a lie validity scale. Each scale is assessed by 6 questions which participants rate on a binary frequency scale scored 1 or 0. We employed the Spanish version of the questionnaire (Sandín, Valiente, Romero, Chorot, & Santed, 2002). The Spanish EPQR-A has good psychometric properties, including evidence of factorial validity, internal consistency, and convergent and discriminant validity. In the present study, the alpha coefficient for each scale was .84 for Extraversion, .75 for Neuroticism, and .50 for Psychoticism.

Symptom Assessment-45 Questionnaire (SA-45) (Davison et al., 1997). This is a 45-item self-report questionnaire of psychiatric symptomatology derived from the original SCL-90. The instrument consists of nine 5-item scales assessing each of the same symptoms domains as its parent instrument with no item overlap across domains. Participants rate the degree to which they have experienced each of the psychiatric 45 symptoms over the past week using a 5-point scale ranging from *not at all* (0) to *very much o extremely* (4). The questionnaire provides measures for each of the 9 scales (each ranged from 0 to 20). We used the Spanish adaptation of the questionnaire (Sandín, Valiente, Chorot, Santed, & Lostao, 2008). With regard to the goals of the present study, we used the following scales of the questionnaire (Cronbach's alphas obtained in this work are in parentheses): hostility (.80), interpersonal sensitivity (.82), somatization (.81), anxiety (.79), obsessive-compulsive (.75), and depression (.82).

Procedure

Participants were recruited through internet electronic announcements within the Universidad Nacional de Educación a Distancia during a period of a month. The invitation to voluntarily participate in the study was addressed to students enrolled in the Faculty of Psychology. Informed consent and administration of the questionnaires were completed as a web based survey, which guaranteed the anonymity of the participants. In order to calculate the temporal stability of the DTS, this measure was completed by the participants in a 7-month second time. In exchange for involvement, participants received credit course. Seven subjects who initially completed the protocol but were unable to complete the DTS at the second time were deleted from the study.

Data analysis

First, means, standard deviations, reliability (Cronbach's alpha and test-retest), univariate analyses of variance to test gender differences, and Pearson's correlations among the study variables were calculated by means of the SPSS 22.0. Second, a confirmatory factor analysis (CFA) of the DTS with robust weighted least squares means and variance (WLSMV) estimator was tested. This estimator is considered optimal for ordinal data CFA (Flora & Curran, 2004). Third, to examine evidence of construct validity we conducted a second CFA model and a SEM with the maximum likelihood robust estimator. In the CFA model, we tested whether a 2-factor model comprised of distress tolerance and current symptoms was a better fit to the data than a single factor model. Distress tolerance was a latent factor with four indicators (the DTS subscale scores). Current symptoms were a latent factor with six indicators, the depression, anxiety, hostility, somatization, obsessive compulsive, and interpersonal

Table 1
Regional distribution of the sample (*N* = 650)

Spanish region	Frecuency	Percentage
Andalucía	100	15.4
Asturias	15	2.3
Aragón	39	6.0
Baleares	14	2.2
Canarias	25	3.8
Cantabria	16	2.5
Castilla-León	45	6.9
Castilla-La Mancha	48	7.4
Cataluña	51	7.8
Extremadura	13	2.0
Galicia	29	4.5
La Rioja	03	0.5
Madrid	145	22.3
Murcia	15	2.3
Navarra	19	2.9
País Vasco	21	3.2
Valencia	52	8.0

sensitivity subscales of the Symptom Assessment-45). Finally, we tested a SEM testing whether distress tolerance mediated associations between personality and current symptoms. This tests the evidence of convergent and discriminant validity of the DTS in respect to associations with personality. Model fit was determined by examining the χ^2 goodness-of-fit, comparative fit index (CFI), root mean square error of approximation (RMSEA), weighted root mean square residual (WRMSR), and standardized root mean square residual (SRMSR). Non-significant χ^2 values indicate good fit. However, χ^2 goodness-of-fit tends to over-reject good fitting models as sample size increases. Values close to .95 for CFI, .06 for RMSEA, .08 for SRMR (Hu & Bentler, 1999), and 1.0 for WRMR (Yu, 2002) represent a good fit. The models were tested in Mplus 7.1 (Muthén & Muthén, 2012).

Results

Descriptive statistics

Means and standard deviations for all study variables are showed in Table 2. As indicated in this table, we found significant differences between men and women on DTS total score (the higher-order scale). Zero-order correlations for study variables are reported in Table 3. Correlations among the four subscales of the DTS were moderate, ranging from .39 to .65. As expected, correlations of the measures of DTS with symptoms of psychopathology (SA-45) and neuroticism were negative and statistically significant. Likewise, as might be expected, the correlations between psychoticism (EPQR-A) and the variables of

distress tolerance were low (ranging from -.05 to -.08). Finally, extraversion (a variable of positive affect) correlated significantly and positively with measures of distress tolerance.

Confirmatory factor analysis

The confirmatory factor analysis of the Spanish DTS replicated the original model of Simons and Gaher (2005) consisting of four lower order factors of tolerance, appraisal, regulation, and absorption that loaded onto a higher-order general factor. The hypothesized model was a good fit to the data χ^2 (86, $N = 650$) = 407.64, $p<.001$, CFI = .98, RMSEA = .076, WRMR = 1.02. Standardized factor loadings were all significant at $p<.001$ and ranged from 0.60 - 0.97 (see Table 4). Correlations between the lower-order factors ranged from .51 - .76. The translated scale thus has a comparable factor structure to the original. Cronbach's alphas were .83 (Tolerance), .89 (Absorption), .84 (Appraisal), and .83 (Regulation). Likewise, the Spanish version has demonstrated adequate 7-month test-retest reliability, both for the DTS total score ($r = .70$) and for the subscales: Tolerance ($r = .60$), Absorption ($r = .69$), Appraisal ($r = .67$), and Regulation ($r = .48$).

Evidence of construct validity

A second CFA model was conducted to examine construct validity of the DTS. A 2-factor structure supports the hypotheses that distress tolerance can be distinguished from symptoms of distress. The 1-factor model was a poor fit to the data χ^2 (35, $N = 650$) = 563.49, $p<.001$, CFI = .77, RMSEA = .152, WRMR = .094. In contrast, the hypothesized 2-factor model fit the data well, χ^2 (34, $N = 650$) = 106.72, $p<.001$, CFI = .97, RMSEA = .057, SRMR = .037. The Satorra-Bentler scaled chi-square difference test indicated that the 2-factor model was a significantly better fit to the data $\Delta\chi^2$ (1, $N = 650$) = 613.08, $p<.001$. Hence the results indicate that distress tolerance is a unique factor discriminable from current symptoms. The factors were correlated at $r = -.61$, $p<.001$.

Second, we tested a SEM testing the convergent and discriminant validity of the DTS. Distress tolerance is expected to be inversely associated with neuroticism, while exhibiting weaker inverse associations with psychoticism and weaker positive associations with extraversion. In addition, distress tolerance is expected to mediate associations between personality and symptom presentation. The correlation matrix is in Table 3. Gender, age, neuroticism, extraversion, and psychoticism were exogenous variables predicting the latent distress tolerance factor, which in turn predicted the current symptoms factor (from the previous measurement model). The model was tested in Mplus 7.1 with the maximum likelihood robust estimator. The fully mediated model did not fit well χ^2 (77, $N = 650$) = 383.15, $p<.001$, CFI = .90, RMSEA = .078, SRMR = .057. We then examined modification indices to improve the fit. This resulted in 3 paths being sequentially freed. First, a direct path from neuroticism to current symptoms was added. Hence, both neuroticism and distress tolerance had unique direct effects on current symptoms. Second, a direct path from extraversion to the interpersonal sensitivity indicator was added. This indicates that extraversion has a unique inverse effect on interpersonal sensitivity that is not accounted for by the latent symptom factor. Third, a direct path from neuroticism to obsessive symptoms was added. Given the positive association

Table 2
Descriptive statistics (mean and *SD*) and gender differences for the study variables

	Total sample (N = 650)	Men (n = 187)	Women (n = 463)	Men vs. women	Effect size
	Mean (SD)	Mean (SD)	Mean (SD)	F(1,648)	ηp2
Distress tolerance (DTS):					
DTS-G	3.48(.84)	3.65(.81)	3.41(.84)	10.4**	.016
Tolerance	3.31(1.10)	3.56(1.06)	3.20(1.09)	14.3***	022
Appraisal	3.84(.88)	3.90(.84)	3.81(.89)	1.3	.002
Absorption	3.33(1.17)	3.59(1.10)	3.22(1.18)	12.8***	.019
Regulation	3.08(1.12)	3.28(1.1.)	3.00(1.24)	8.1*	012
Personalidty (EPQR-A):					
Neuroticism	2.3(1.9)	1.7(1.8)	2.6(1.9)	25.4***	038
Extraversion	3.8(2.1)	3.9(2.1)	3.8(2.1)	< 1	001
Psychoticism	1.6(1.3)	1.7(1.3)	1.6(1.2)	1.2	002
Psychiatric symptoms (SA-45):					
Depression	3.8(3.2)	3.2(3.1)	4.0(3.2)	8.1*	012
Hostility	1.6(2.3)	1.5(2.3)	1.6(2.4)	< 1	000
Interpersonal sensitivity	2.9(3.0)	2.3(2.7)	3.2(3.1)	10.8**	016
Somatization	3.4(3.3)	2.6(2.6)	3.8(3.5)	15.7***	024
Anxiety	4.1(3.0)	3.5(2.7)	3.5(2.7)	12.7***	019
Obsessive-compulsive	3.3(2.8)	2.9(2.4)	3.5(3.0)	5.4	008

Note: In order to control for Type I error, we applied the Bonferroni correction in multiple comparisons. η_p^2 = partial η^2. DTS = Distress Tolerance Scale. EPQR-A = Eysenck Personality Questionnaire Revised–Abbreviated. SA-45 = Symptom Assessment–45 Questionnaire
* $p<0.05$; ** $p<0.01$; *** $p<0.001$

Table 3
Correlation matrix of observed variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. DTS-G	.82														
2. Tolerance	.85	.83													
3. Absorption	.85	.65	.89												
4. Appraisal	.80	.62	.65	.84											
5. Regulation	.74	.48	.44	.39	.83										
6. Hostility	-.31	-.20	-.33	-.33	-.16	.80									
7. Interpersonal Sen.	-.42	-.31	-.44	-.41	-.21	.45	.82								
8. Somatization	-.25	-.18	-.24	-.26	-.14	.39	.40	.81							
9. Anxiety	-.43	-.34	-.43	-.39	-.23	.54	.53	.53	.79						
10. Obsessive	-.41	-.34	-.40	-.39	-.19	.45	.59	.50	.62	.75					
11. Depression	-.44	-.33	-.46	-.42	-.20	.53	.64	.43	.61	.57	.82				
12. EPQR-A_Neuroticism	-.49	-.36	-.49	-.50	-.25	.44	.46	.37	.53	.37	.53	.75			
13. PQR-A_Psychoticism	-.08	-.06	-.05	-.07	-.08	.15	.05	.14	.13	.07	.15	.12	.50		
14. EPQR-A_Extraversion	.17	.14	.21	.23	-.01	-.08	-.31	-.11	-.10	-.16	-.23	-.20	.03	.84	
15. Age	-.07	-.00	.11	.01	.10	-.11	-.16	-.00	-.13	-.12	-.17	-.14	-.05	-.07	

Note: N = 650. DTS-G = the higher-order scale. Hostility–Depression are subscales of the SA-45. Cronbach alphas are on the diagonal. EPQR-A = Eysenck Personality Questionnaire Revised–Abbreviated. $r \geq |.08|$ significant at $p<.05$, $r \geq |.11|$ significant at $p<.01$, $r \geq |.13|$ significant at $p<.001$. Gender is coded male = 1, female = 2

Table 4
Item mean, standard deviation, and factor loadings for the DTS

	M (SD)	Factor loading
Tolerance		.86
1. Feeling distressed or upset is unbearable to me	3.12(1.26)	.90
3. I can't handle feeling distressed or upset	3.28(1.27)	.94
5. *There's nothing worse than feeling distressed or upset*	3.53(1.29)	.77
Appraisal		.85
6. I can tolerate being distressed or upset as well as most people (R)	3.87(1.12)	.66
7. My feelings of distress or being upset are not acceptable	4.04(1.11)	.74
9. Other people seem to be able to tolerate feeling distressed or upset better than I can	3.34(1.27)	.76
10. Being distressed or upset is always a major ordeal for me	3.57(1.20)	.83
11. I am ashamed of myself when I feel distressed or upset	4.20(1.13)	.71
12. My feelings of distress or being upset scare me	4.00(1.24)	.79
Absorption		.89
2. When I feel distressed or upset, all I can think about is how bad I feel	3.21(1.28)	.91
4. My feelings of distress are so intense that they completely take over	3.67(1.32)	.91
15. When I feel distressed or upset, I cannot help but concentrate on how bad the distress actually feels	3.10(1.28)	.89
Regulation		.60
8. I'll do anything to avoid feeling distressed or upset	3.15(1.31)	.89
13. I'll do anything to stop feeling distressed or upset	3.29(1.36)	.97
14. When I feel distressed or upset, I must do something about it immediately	2.81(1.36)	.67

Note: N = 650. Item factor loadings are standardized loadings for the first-order factors. For the Tolerance, Appraisal, Absorption, and Regulation factors, standardized loadings on the higher-order Distress Tolerance general factor are reported. Item 6 was reverse scored. DTS-G = higher order factor

between neuroticism and obsessive symptoms, this inverse association is some form of suppression effect. The final model fit well, χ^2 (74, N = 650) = 240.18, $p<.001$, CFI = .95, RMSEA = .059, SRMR = .039 (See Figure 1). Significance of indirect effects of personality on current symptoms via distress tolerance was calculated by bias-corrected bootstrapped confidence intervals. There was a significant indirect positive effect of neuroticism on current symptoms via distress tolerance B = 0.19 95% CI [0.14, 0.25]. Conversely, there was a significant indirect inverse effect of extraversion on current symptoms via distress tolerance B = -0.04 95% CI [-0.07, -0.02].

Discussion

The primary aim of the present study was to examine the factor structure and psychometric properties of the Spanish DTS in a nonclinical sample of young adults. A CFA supported a hierarchical four-factor structure of the scale. This structure consists of four lower order factors of tolerance, absorption, appraisal, and regulation, which loaded onto a higher-order factor of general distress tolerance. These data replicated the previous findings reported by Simons and Ghaer (2005) based on the original confirmatory factor analysis of the English version of the DTS,

Table 5 Spanish Distress Tolerance Scale (DTS)				
Instrucciones: piense en los momentos en que se siente angustiado/a o disgustado/a. Indique para cada una de las afirmaciones el número que mejor describa lo que usted cree acerca de sentirse angustiado o disgustado *[Directions: Think of times that you feel distressed or upset. Select the item from the menu that best describes your beliefs about feeling distressed or upset]*				
Muy de acuerdo *[Strongly agree]*	Algo de acuerdo *[Mildly agree]*	Igual de acuerdo que en desacuerdo *[Agree and disagree equally]*	Algo en desacuerdo *[Mildly disagree]*	Muy en desacuerdo *[Strongly disagree]*
1	2	3	4	5

Por favor, rodee el número que corresponda para cada afirmación:
[Please, circle the number for each statement:]

1. Sentir angustia o disgusto es para mí insoportable
   [Feeling distressed or upset is unbearable to me]   1 2 3 4 5

2. Cuando estoy angustiado/a o disgustado/a, sólo puedo pensar en lo mal que me siento
   [When I feel distressed or upset, all I can think about is how bad I feel]   1 2 3 4 5

3. Me resulta inaguantable la sensación de angustia o disgusto
   [I can't handle feeling distressed or upset]   1 2 3 4 5

4. Mis sentimientos de angustia son tan intensos que me absorben por completo
   [My feelings of distress are so intense that they completely take over]   1 2 3 4 5

5. No hay nada peor que sentirse angustiado/a o disgustado/a
   [There's nothing worse than feeling distressed or upset]   1 2 3 4 5

6. Puedo tolerar estar angustiado/a o disgustado/a tan bien como la mayoría de la gente (*)
   [I can tolerate being distressed or upset as well as most people]   1 2 3 4 5

7. Mis sentimientos de angustia o disgusto no son aceptables
   [My feelings of distress or being upset are not acceptable]   1 2 3 4 5

8. Haré cualquier cosa para evitar la sensación de angustia o disgusto
   [I'll do anything to avoid feeling distressed or upset]   1 2 3 4 5

9. Otras personas parecen ser capaces de tolerar mejor que yo la sensación de angustia o disgusto
   [Other people seem to be able to tolerate feeling distressed or upset better than I can]   1 2 3 4 5

10. Mis sentimientos de angustia o disgusto siempre suponen para mí un reto difícil
    [Being distressed or upset is always a major ordeal for me]   1 2 3 4 5

11. Me avergüenzo de mí mismo/a cuando me siento angustiado/a o disgustado/a
    [I am ashamed of myself when I feel distressed or upset]   1 2 3 4 5

12. Mis sentimientos de angustia o disgusto me asustan
    [My feelings of distress or being upset scare me]   1 2 3 4 5

13. Haré cualquier cosa para dejar de sentirme angustiado/a o disgustado/a
    [I'll do anything to stop feeling distressed or upset]   1 2 3 4 5

14. Cuando me siento angustiado/a o disgustado/a, debo hacer algo sobre ello enseguida
    [When I feel distressed or upset, I must do something about it immediately]   1 2 3 4 5

15. Cuando estoy angustiado/a o disgustado/a, en realidad no puedo dejar de pensar en lo mal que me siento
    [When I feel distressed or upset, I cannot help but concentrate on how bad the distress actually feels]   1 2 3 4 5

Note: Spanish version of the Distress Tolerance Scale (DTS; Simons & Gaher, 2005). Subscales: Tolerancia [*Tolerance*] (items 1, 3, 5), Valoración [*Appraisal*] (items 6, 7, 9, 10, 11, 12), Absorción [*Absortion*] (items 2, 4, 15), and Regulación [*Regulation*] (items 8, 13, 14). (*) Item 6 is reverse scored. Subscale scores are the mean of the items. The higher order DTS is formed from the mean of the four subscales

providing cross-cultural evidence for the hierarchical structure of the scale and for factorial validation of the four dimensions of the DTS. Our findings also agree with data found by Leyro et al. (2011). These authors evaluated the latent structure of the DTS among a sample of cigarette smokers and demonstrated that a hierarchical multidimensional model provided a better fit for the observed DTS data than a single factor model. Specifically, they found a single second-order factor of distress tolerance, and four lower-order factors including tolerance, absorption, appraisal, and regulation. While theoretically the hierarchical multidimensional model may be less parsimonious than the single factor model

of the DTS, it does provide greater conceptual specificity of the structure and potential key elements underling distress tolerance.

The Spanish version of the DTS is both an internally consistent and a stable measure. The internal consistency of the DTS total score (i.e., the higher order scale) was good, as well as the internal consistency of the subscales (i.e., tolerance, absorption, appraisal, and regulation; alpha coefficients ranged from .83 to .89). Likewise, results indicated that the Spanish version of the DTS is a temporally stable measure over a 7-month period, both for the higher-order distress tolerance factor and for the four subscales. Results are consistent with previous reliability data reported by
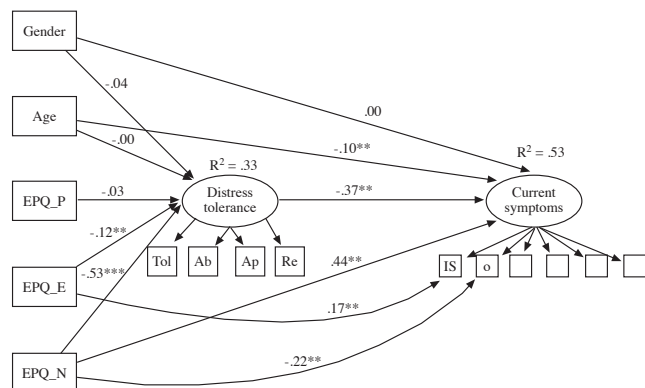
Figure 1. Association between personality, distress tolerance and current symptoms. χ² (74, *N* = 650) = 240.18, *p*<.001, CFI = .95, RMSEA = .039. EPQ = Eysenck Personality Questionnaire Revised-Abbreviated; E = Extraversion; N = Neuroticism; P = Psychoticism; Tol, Ab, Ap, and Re are the tolerance, absorption, appraisal, and regulation subscales of the DTS; IS and O are the interpersonal sensitivity and obsessive subscales of the SA-45
** *p*<.01, *** *p*<.001

Simons and Ghaer (2005) in their original validation work of the DTS.

There were significant gender differences in distress tolerance. As expected, men scored significantly higher than women on the DTS (total score). This is consistent with several previous studies (Gaher et al., 2013; Kiselika et al., 2014). In addition, significant gender differences were detected on subscales of the DTS, such that men reported higher scores on the tolerance, absorption, and regulation subscales than women. No significant differences were found on the appraisal dimension of the scale between men and women. As far as we know, no other studies had reported information concerning gender differences on the DTS subscales. Examination of means and standard deviations of the DTS items (see Table 2) assessing appraisal indicators suggests that these items tend to be endorsed more strongly than items of regulation, absorption, or tolerance. Hence, negative appraisals may represent a more pathological (less normative) aspect of intolerance for distress. Gender differences related to personality and psychopathological symptoms are also consistent with past research (Roncero, Fornés, García-Soriano, & Belloch, 2014) (see Table 2).

Consistent with the initial validation study, our results also provided evidence supporting evidence of construct, convergent and discriminant validity of the translated scale. In this regard, we found that a two-factor CFA model that consisted of distress tolerance and current psychiatric symptoms provided better fit to the data than a single factor model. Thus, it was demonstrated that distress tolerance is a construct different from other emotional concepts, such as symptoms of distress. These results are also in line with findings reported by Bernstein et al. (2009); using the original DTS and applying factor analytic techniques, these authors demonstrated that distress tolerance is conceptual and structurally distinct from other emotional constructs at a latent level of analysis, such as anxiety sensitivity or discomfort intolerance.

Lastly, the DTS total score, as well as the four subscales, demonstrated evidence of convergent validity with significant moderate to large negative correlations with neuroticism, and of discriminant validity with weaker negative associations with

psychoticism and weaker positive associations with extraversion. These results are consistent with past research on relationships between distress tolerance (measured with the DTS) and affectivity (Gaher et al., 2013; Howell et al., 2010; Simons & Gaher, 2005). In further support for evidence of convergent, discriminant, and predictive validity of the translated DTS, we found that the DTS partially mediated associations between personality and current symptoms.

Our second main goal was to examine the relationship between distress tolerance and neuroticism and psychiatric symptoms. We hypothesized that distress tolerance could mediate the effect of neuroticism on psychiatric symptoms. Apart from the direct effects of personality variables on current symptoms, a main finding was that distress tolerance significantly mediated the relationship between neuroticism and current psychopathological symptoms. Though the cross-sectional nature of the study does not allow us to disentangle the nature of the association between the predictors and the criterion variables, these results suggest that distress tolerance may partially explain the well-established association between neuroticism (negative affect) and psychiatric symptoms. A possible mechanism to describe the association between neuroticism and psychopathology views neuroticism as an enduring trait making individuals more likely to experience distress during adverse situations. An emotion-based characteristic that may explain the link between neuroticism and psychiatric symptoms is distress tolerance. Emotion regulation difficulties linked with low distress tolerance (or distress intolerance) are connected with a number of psychological health-related problems. Our data add to the literature by documenting a mediating process for which the effect of neuroticism on current psychiatric symptoms (anxiety, depression, somatization, and hostility) was in part accounted for by distress tolerance. Also, results of the present study extend upon current preliminary empirical evidence on mediating effect of distress tolerance on the effect between negative affectivity and borderline symptoms (Gaher et al., 2013).

There are several limitations of the current study that warrant mention. The sample consists of psychology university participants and predominantly white. Future studies should replicate the present findings of the Spanish DTS in more diverse samples, especially including individuals with psychopathological problems and/or mental disorders that theoretically are expected to be related to low levels of distress tolerance (e.g., borderline personality disorder, eating disorders, addictions, emotional disorders, etc.). Second, the data were collected via self-report assessment. New studies on validity of the Spanish DTS may benefit by utilizing alternative measures of distress tolerance (e.g., behavioral measures) and outcome or criterion measures (e.g., clinician rated instruments, clinical interviews).

Some suggestions for future research may include taking into account possible associations between the DTS as a transdiagnostic measure and comparable concepts, such as anxiety sensitivity, or emotional avoidance, discomfort intolerance, affect intensity, tolerance of ambiguity, and other related constructs (Inchausti, Delgado, & Prieto, 2015; García-Escalera, Chorot, Valiente, Reales, & Sandín, 2016; Pedrosa, Suárez-Álvarez, García-Cueto, & Muñiz, 2016). Although previous research has provided evidence supporting unique features for the distress tolerance construct (Bernstein et al., 2009; Gaher et al., 2013; Keough et al., 2010; Leyro et al., 2010), future research should delineate relationships between distress tolerance and such constructs.

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