Ruminating in English, Ruminating in Spanish: Psychometric Evaluation and Validation of the Response Thoughts Style Questionnaire in Spain, Argentina, and USA

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Summary

The present study aimed to adapt and validate a Spanish version of the Ruminative Thought Style Questionnaire (RTSQ) and test for measurement invariance of the RTSQ across college students in U.S., Spain, and Argentina (n=1632). Additionally, we examined/compared across these countries, criterion-related (i.e., concurrent) evidence of validity of RTSQ factors (i.e., problem-focused thoughts, counterfactual thinking, repetitive thoughts, and anticipatory thoughts) on constructs theoretically-associated with rumination. Consistent with previous findings, we found that a 15-item 4-factor RTSQ provided a more adequate model compared to single factor CFA models (15 and 20-item versions) in every country. The reliability and validity of the subscales for the Spanish version were satisfactory-to-good in Spain and Argentina. Using multi-group confirmatory factor analyses, we found that the 15-item 4-factor version of the RTSQ to be invariant across countries and sex. Bivariate correlations provided evidence for the criterion-related validity of the 4-factor RTSQ across the countries. Our findings suggest that self-report items of the RSTQ convey the same meaning, and that responses to those items load into the same set of factors, across languages and cultures of administration. Taken together, our findings serve as a foundation for future cross-cultural work testing models in which rumination is a central facet.

Key words: cross-cultural; college students; measurement invariance; psychometrics; rumination; sex differences

Introduction

Clinically, rumination has been shown to be a robust risk factor for psychopathology (e.g., depression, anxiety, substance use; see Nolen-Hoeksema, Wisco, & Lyubormisky, 2008 for a review). Among rumination measures, the Response Styles Questionnaire (Nolen-Hoeksema, 1991) and the Ruminative Responses Scale (Treynor, Gonzalez, & Nolen-Hoeksema, 2003) are the most commonly used with translations in many languages including Spanish (Extremera & Fernández-Berrocal, 2006). However, one critique of these measures is that participant responses' may be cofounded by depressive symptoms (Treynor et al., 2003; Brinker & Dozios, 2009). Drawing from this limitation, Brinker and Dozios (2009) created the 20-item Ruminative Thought Style Questionnaire (RTSQ), which assesses participant's overall tendency toward ruminative thinking (self-reported) and does not focus on disorder-specific content. Although an initial examination suggested a single factor structure (Brinker & Dozios, 2009), recent factor analytic work (Tanner, Voon, Hasking, & Martin, 2013) suggests that the RTSQ assesses four distinct subcomponents of rumination: problem-focused thoughts (i.e., consistent thinking of causes, consequences, and symptoms of negative affect), counterfactual thinking (i.e., thinking about alternative outcomes/reality), repetitive thoughts (i.e., persistent reflection on negative affect), and anticipatory thoughts (i.e., future-orientated rumination). Recently, Helmig, Meyer, and Bader (2016) created a German version of the RTSQ and also found that the 4-subscale model (15 items; with the same four factors found by Tanner et al., 2013) fit better than a 1-factor model (20-items) in both a community and clinical sample.

Using the same four factors found by Tanner et al. (2013), several recent studies have shown that these facets of rumination are differentially associated with psychological outcomes including: typical weekly alcohol use and 30-day alcohol-related negative consequences (problem-focused thoughts was the strongest predictor of alcohol outcomes; Bravo, Pearson, & Henson, 2017), non-suicidal self-injury (only problem-focused thoughts was significantly

associated with nonsuicidal self-injury; Voon, Hasking, & Martin, 2014), depressive symptoms (only anticipatory thoughts and repetitive thoughts moderated the relationship between PTSD and depressive symptoms; Roley et al., 2015), and posttraumatic stress disorder (counterfactual thinking was positively associated with DSM-5 PTSD symptom clusters; Mitchell, Contractor, Dranger, & Shea, 2016).

Given that these rumination facets may be an important target for intervention, we aimed to adapt and validate a Spanish version of the RTSQ across two distinct Spanish speaking countries (Spain and Argentina). Further, recent studies have demonstrated cross-cultural differences on rumination (e.g., differences between Northern European countries and Southern/Eastern European Countries; Potthoff et al., 2016); thus we tested for measurement invariance of the RTSQ in the U.S., Spain, and Argentina, and tested for mean differences across these countries. In addition, we explored and compared the concurrent validity of the measure across these countries with constructs known to be associated with rumination, such as depressive symptoms (Nolen-Hoeksema et al., 2008) and personality. Thus, a mediational model has been proposed in which the personality domain of neuroticism would lead to a rumination response style. This, in turn, would relate to depressive symptoms (Muris et al., 2005; Roelofs, 2008). Furthermore, individual differences in behavioral dysregulation, or impulsivity[1], have also been connected to rumination, especially the urgency facet (d'Acremont & Van der Linden, 2007; Selby et al., 2008). Finally, and given the extensive research indicating significant sex differences in rumination (i.e., women ruminate more than men; see Johnson & Whisman, 2013 for a meta-analysis), we conducted additional measurement invariance testing across sex.

[1] Impulsivity is a multifaceted personality construct that may lead to behavioral dysregulation and disinhibition through distinct processes. There are different taxonomic models of impulsivity/disinhibition, however, one of the most useful and accepted comprises the facets of urgency (positive and negative), (lack of) perseverance, (lack of) premeditation, and sensation seeking (Whiteside & Lynam, 2001).

Method

Participants and Procedure

Participants were college students recruited from four universities across the U.S. (two universities), Argentina, and Spain to participate in an online survey regarding personal mental health, personality traits, and alcohol use behaviors. Although 1,864 students were recruited across sites, for the present study only data from students that completed the RTSQ (n=1,632) were included in the final analysis from each sample (U.S. sites combined, n=924; Argentina, n=403, Spain, n=305). Across the countries, the majority of participants were female (n = 1085; 66.5%) and reported a mean age of 21.94 (SD = 5.51) years (see Supplemental Table 1 for demographic breakdown across countries). College students from the southeastern U.S. site (n=700) received research credit for completing the study (i.e., extra credit for courses at the participating university) while students at the southwestern U.S. site (n=224) did not receive any compensation for their participation. In Argentina, all the students who completed the survey took part in a raffle of four cash prizes (each of ≈US$ 36) and other items. In Spain, three checks of 100 euros each to exchange for office materials (i.e., photocopies, pens, folders) were raffled among the participants. The study was approved by the institutional review boards at the participating universities.

Measurement Translation

Four psychologists, proficient in English and Spanish, and with expertise in test adaptation, translated the original English version (RTSQ; Brinker & Dozier, 2009) to Spanish. Then, two members of the research team compared the versions (i.e., adjusted the items to be equivalent in Spain and Argentina), and after a thorough discussion, composed a preliminary version of the instrument. Finally, an English language teacher unfamiliar with the inventories conducted a back translation. The analysis of the back translation indicated the Spanish version of the RTSQ could be considered comparable to the original scales.

Measures

Across all sites, students completed the same battery of measures online using *Qualtrics* software. For all measures except the RTSQ, composite scores were created by averaging or summing items and reverse-coding items when appropriate such that higher scores indicate higher levels of the construct. Descriptive statistics and reliability coefficients for these composite measures are shown in Supplemental Table 1.

Rumination. Rumination was assessed using the 20-item *RTSQ* (Brinker & Dozois, 2009), measured on a 7-point response scale (1=*Not at all*, 7=*Very Well*). The participants were provided with instructions stating, "For each of the items below, please rate how well the item describes you". Tanner et al., (2013) found that the four rumination subcomponents had good to excellent reliability: *Problem-focused Thoughts* (5 items, α=.89), *Counterfactual Thinking* (4 items, α=.87), *Repetitive Thoughts* (4 items, α=.89), and *Anticipatory Thoughts* (2 items, α=.71).

Big Five personality traits. Personality traits were assessed using the 50-item *Big Five Personality Trait Short Questionnaire* (BFPTSQ; Morizot, 2014) at the U.S. sites and the Spanish version (Ortet, Martínez, Mezquita, Morizot, & Ibáñez, 2017) at the sites in Spain and Argentina. The measure assesses five specific personality traits on a 5-point response scale (1=*Disagree Strongly*, 5=*Agree Strongly*): *Openness*, *Extraversion*, *Agreeableness*, *Conscientiousness,* and *Emotional Stability*.

Impulsivity-like traits. Impulsivity-like traits were assessed using the 59-item *UPPS-P Impulsive Behavior Scale* (Lynam, Smith, Whiteside, & Cyders, 2006) at the U.S. sites and the 59-item Spanish version (Verdejo-García, Moya, Alcázar, & Pérez-García; 2010; Pilatti, Lazano, & Cyders, 2015) at the sites in Spain and Argentina. The measure assesses five specific impulsivity-like traits on a 4-point response scale (1=*Disagree Strongly*, 4=*Agree Strongly*): P*ositive Urgency, Negative Urgency, Premeditation*, *Perseverance*, and *Sensation-seeking*.

Depressive Symptoms. Depressive symptoms were assessed using the 20-item *Center*

for Epidemiological Studies Depression (CESD; Radloff, 1977) at the U.S. sites and the 20-item Spanish Version (Masten, Cadwell-Colbert, Alcala, & Mijares, 1986; Perczek, Carver, & Price, 2000) at the Spain and Argentina sites. Items were measured on a 4-point response scale (0=*Not at all or Less than 1 day,* 1=*1-2 Days,* 2=*3-4 Days,* 3=*5-7 Days,* 3=*Nearly Every day for 2 weeks*).

Statistical Analysis

First, we conducted confirmatory factor analyses with a maximum likelihood estimation with robust standard errors (MLR) of the RTSQ at the Argentina and Spain sites separately using M*plus* 7.4 (Muthén & Muthén, 1998-2012), in order to examine the internal structure of the Spanish version of the questionnaire and to compare the adequacy of a single factor of rumination (both 20-item and 15-item versions) (Brinker & Doziois, 2009) with a 15-item 4-factor model based on subscales proposed by Tanner et al., (2013). To evaluate overall model fit, we used model fit criteria suggested by Marsh et al. (2004) including the Comparative Fit Index (CFI) >.90 (acceptable) > .95 (optimal), Tucker-Lewis Index (TLI) >.90 (acceptable) > .95 (optimal), Root Mean Square Error of Approximation (RMSEA) < .06, and Standardized Root Mean Square Residual (SRMR) < .08. We tested for differences in the CFAs using $\chi 2$ difference test using the Santorra-Bentler scaling correction (Satorra, 2000; Satorra & Bentler, 2001). We further calculated Cronbach's alpha to test the internal consistency of the measure across sites.

Upon deciding on the best fitting model, we conducted multi-group confirmatory factor analyses (MG-CFA) using M*plus* 7.4 with a diagonally weighted least squares (WLSMV) estimator (as recommended by Li, 2015) to determine the factorial invariance of the questionnaire across participants in different countries (i.e., U.S., Argentina, and Spain). Specifically, we tested three levels of measure invariance: configural (test whether items load on the proposed factors), metric (test whether item-factor loadings are equal across groups), and scalar (test whether the unstandardized item thresholds are equal across groups). If all three of

the measurement levels are shown to be invariant (based on model fit criteria described below), then we can confidently compare rumination mean scores across countries. Given that the χ^2 test statistic is sensitive to sample size (Brown, 2015), we used model comparison criteria of ΔCFI/ΔTFI $\geq$.01 (Cheung & Rensvold, 2002) and ΔRMSEA $\geq$.015 (Chen, 2007) to indicate significant decrement in fit when testing for measurement invariance. Finally, criterion-related validity (i.e., concurrent validity [when the test and the criterion-relate measure are administered at the same time]) of the measure was assessed examining the correlation between the rumination subscales and theoretically-associated constructs: Big Five personality traits, impulsivity-like traits, and depressive symptoms. Specifically, criterion-related validity refers to the relationship between the test´s scores with other theoretically relevant constructs (International Test Commission, 2015).

Results

Spanish Adaptation CFAs

In both Argentina and Spain, the 15-item 4-factor CFA model provided an acceptable fit to the data; whereas, the single factor CFA models (15 and 20-item versions) provided an extremely poor fit to the data (see Table 1). Chi-square different tests (as well as changes in CFI/TFI/RMSEA across models) indicated that the 4-subscale model is a more adequate model of the Spanish RTSQ for both Argentina and Spain participants (also found among the U.S. sample; see Table 1). Within the 4-fator model, the standardized loadings of the indicator variables on their hypothesized factors were all salient (i.e. $\geq$ .30; Brown, 2015) for both Argentina and Spain subsamples. Problem-focused thoughts (α=.84, Argentina; α=.86, Spain), counterfactual thinking (α=.81, Argentina; α=.80, Spain), and repetitive thoughts (α=.88, Argentina; α=.89, Spain) had good reliability; whereas, anticipatory thoughts (α=.59, Argentina; α=.60, Spain) showed acceptable reliability (Loewenthal, 2001). See Appendix A for the items by subscale of the Spanish version of the RTSQ.

Measurement Invariance and Latent Mean Comparisons

Based on the results above, a 4-factor CFA was tested for measurement invariance across the three countries and sex. Analyses revealed that the 4-factor CFA was invariant across both country and sex, such that the configural, metric, and scalar models had acceptable-to-excellent fit and did not significantly differ from each other based on changes in CFI/TLI/RMSEA (see Table 2). To test for latent factor score mean differences by country, we first set the U.S. group's latent mean in the full scalar invariant model to 0 and allowed the Argentina and Spain groups' latent mean to freely estimate. To examine the latent mean difference between Argentina and Spain we followed a similar approach but now the Argentina group's latent mean was constrained to 0 and the Spain and U.S. groups' latent means were allowed to freely estimate. A statistically significant result indicates a significant mean difference in the latent factor between the reference group and the predictor group.

Using the U.S. as the reference group, we found that Argentine participants reported slightly lower scores on problem-focused thoughts (*M difference*=-0.25, *p*=.001), counterfactual thinking (*M difference*=-0.21, *p*=.018), and repetitive thoughts (*M difference*=-0.19, *p*=.022), but did not significantly differ with U.S. participants on anticipatory thoughts (*M difference*=-0.13, *p*=.162). Spanish participants reported slightly lower scores on counterfactual thinking (*M difference*=-0.22, *p*=.022) and repetitive thoughts (*M difference*=-0.41, *p*<.001), but did not significantly differ with U.S. participants on problem-focused thoughts (*M difference*=-0.15, *p*=.075) or anticipatory thoughts (*M difference*=-0.19, *p*=.841). Using Argentina as the reference group, we found that Spanish participants reported slightly lower repetitive thinking (*M difference*=-0.22, *p*=.046), but did not significantly differ with Argentine participants on problem-focused thoughts (*M difference*=0.10, *p*=.259), counterfactual thinking (*M difference*=-0.00, *p*=.981), or anticipatory thoughts (*M difference*=0.11, *p*=.313). Independent of country, women reported significantly higher scores on all four factors than men: problem-focused

thoughts (*M difference*=0.27, *p*<.001), counterfactual thinking, (*M difference*=0.19, *p*=.017), repetitive thinking, (*M difference*=0.40, *p*<.001), and anticipatory thoughts, (*M difference*=0.35, *p*<.001).

Criterion-related Validity

Bivariate correlations of the 4-latent RTSQ factors and study variables are summarized in Table 3. Across all three countries, all four rumination facets tended to be significantly positively associated with negative urgency, positive urgency, and depressive symptoms (*p*<.01). All four rumination facets tended to be significantly negatively associated with Big Five personality traits (openness had mixed results) and perseverance. Correlations with premeditation and sensation seeking were largely non-significant. Further, we used the Fisher *r*-to-*z* transformation (Fisher, 1915) to test the statistical significance (Bonferroni correction: *p*<.00034) of differences in correlation coefficients between countries (see Table 3). For the most part, the strength of the correlations did not differ across countries (only 5 significant differences). Although each of the rumination factors were significantly correlated with each other, results still revealed different associations with theoretical-related constructs (see Table 3). Taken together, there is strong support for the criterion-related validity of the 4-factor RTSQ across multiple countries.

Discussion

The present study sought to adapt a Spanish version of the RTSQ, examine measurement invariance across college students in the U.S., Spain, and Argentina, and examine the criterion-related validity of a 4-facet operationalization of rumination. Consistent with previous research (Helmig et al., 2016; Tanner et al., 2013), we found that the 4-subscale model fit better than a 1-factor model (both the 20-item and 15-item version) and the reliability and validity of the subscales were satisfactory-to-good across all three countries. The 15-item 4-factor measure was also found to be scalar invariant across countries and sex; thus, we were able to examine mean

differences across these different subpopulations.

Among 12 possible mean differences across countries, we found six significant mean differences: Spanish participants had lower endorsement of repetitive thinking than both U.S. and Argentine participants and lower endorsement of counterfactual thinking compared to U.S. participants. Argentine participants had lower endorsement of problem-focused thoughts, counterfactual thinking, and repetitive thoughts than U.S. participants. Although these differences were statistically significant, they were rather small and warrant further study to determine if they reflect true cultural differences. Consistent with previous work (Johnson & Whisman, 2013), we found that women reported higher scores on all four facets of rumination. Our measurement invariance testing suggests that the RTSQ captures four facets of rumination similarly across male and female college students in the U.S., Spain, and Argentina.

Across 144 possible correlation differences (4 RTSQ facets X 3 countries X 12 criterion), we found 5 statistically significant differences (~3.5% of comparisons after alpha corrections). We did not discern a parsimonious explanation for these differences as they do not follow a consistent pattern. Specifically, we found: 1) problem-focused thoughts was more correlated (negative association) with openness in Spain (r=-.30) compared to the U.S. (r=-.07), 2) counterfactual thinking was more correlated (negative association) with perseverance in Spain (r=-.25) compared to the U.S (r=-.00), 3) counterfactual thinking was more correlated (negative association) with agreeableness in Spain (r=-.33) compared to the U.S (r=-.03), 4) repetitive thoughts was more correlated (negative association) with openness in the U.S. (r=.23) compared to Spain (r=-.04), and 5) anticipatory thoughts was more correlated (negative association) with extraversion in Spain (r=-.31) compared to the U.S (r=-.06). Importantly, in each country, all four facets of rumination had robust positive associations with depressive symptoms and urgency facets of impulsivity, and also a robust negative associations with emotional stability (the converse of neuroticism), in accordance with previous studies (Muris et al., 2005; Nolen-

Hoeksema, et al., 2008; Selby et al., 2008). Interestingly, low conscientiousness and lack of perseverance also presented moderate associations with all facets of rumination, except repetitive thoughts. This is consistent across the three countries, and therefore, confirms previous findings (Conway et al., 2000; d'Acremont & Van der Linden, 2007). Taken together, our examination of criterion-related validity suggests that rumination has a similar nomological network across these countries.

Strengths and Limitations

The strengths of the present study must be contextualized in the face of its limitations. First, although internal evidence was provided, more studies are needed to examine other sources of construct validity. Specifically, future work could build on these results and examine the lack of association between the RTSQ´s scores and measures of different constructs (i.e., discriminant validity) or the association between the RTSQ´s scores and scores of other measures of rumination (convergent validity). Future studies should also examine other theoretically-related constructs (i.e., psychological distress and coping styles) to provide further support for criterion-related validity. Based on theory (Nolen-Hoeksema, 1991) and a large body of empirical work (see Olatunji, Naragon-Gainey, & Wolitzky-Taylor, 2013 for a meta-analysis), we believe that rumination is a central construct that can lead to specific cognitive, emotional, and behavioral problems. However, the cross-sectional, observational study design of the present study prevents our ability to make causal inferences using these data. Although our results suggest that the RTSQ captures four facets of rumination similarly across college students in the U.S. and in two Spanish-speaking countries with distinct dialects (Spain and Argentina), more work is needed to ensure invariance across a wider range of countries and in other populations other than college students. Although we were able to administer the same battery of surveys across three countries, we had to use different recruitment procedures and incentives to encourage participation. Therefore, differences across countries are somewhat conflated with difference in

recruitment procedures. Given that our findings were remarkably consistent across the countries, we expect that these differences did not significantly bias our results. Finally, women were significantly and differently overrepresented in each sample (higher in U.S. and Spain compared to Argentina).

Conclusion

In the present study, we successfully adapted the RTSQ into Spanish (see Appendix A), found that the 15-item 4-factor version of the measure was invariant across three countries (U.S., Spain, and Argentina) and sex, and established that four facets of rumination (i.e., problem-focused thoughts, counterfactual thinking, repetitive thoughts, and anticipatory thoughts) correlate similarly across countries with personality traits, impulsivity-like traits, and depressive symptoms. Taking the most conservative stance, the present study provides evidence that the RTSQ can be used to measure four facets of rumination among male and female college students in the U.S., Spain, and Argentina. Taking a more liberal stance, the present study supports the validity of the RTSQ and suggests that the RTSQ can be used in a wider range of English-speaking and Spanish-speaking countries. The present study serves as a foundation for future cross-cultural work testing models in which rumination is a central facet.

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Table 1

Model fit comparisons of a 20-item 1-factor RTSQ and 15-item 1-factor RTSQ vs the 15-item 4-factor RTSQ across countries

Argentina

	Overall Fit Indices						Comparative Fit Indices					
	χ^2	*df*	CFI	TLI	RMSEA	SRMR	Model Comparison	$\Delta\chi^2$	Δdf	ΔCFI	ΔTLI	ΔRMSEA
1. 20-item 1-factor	1048.59	170	.729	.697	.113 (.107, .120)	.077						
2. 15-item 1-factor	756.22	90	.718	.672	.136 (.127, .145)	.086	1 vs 3	769.28***	86	-.192	-.204	.039
3. 15-item 4-factor	271.65	84	.921	.901	.074 (.065, .084)	.061	2 vs 3	358.13***	6	-.203	-.229	.062

Spain

	Overall Fit Indices						Comparative Fit Indices					
	χ^2	*df*	CFI	TLI	RMSEA	SRMR	Model Comparison	$\Delta\chi^2$	Δdf	ΔCFI	ΔTLI	ΔRMSEA
1. 20-item 1-factor	775.45	170	.753	.724	.108 (.100, .116)	.076						
2. 15-item 1-factor	554.40	90	.749	.707	.130 (.120, .141)	.086	1 vs 3	559.72***	86	-.207	-.224	.045
3. 15-item 4-factor	201.49	84	.936	.921	.068 (.056, .080)	.054	2 vs 3	241.74***	6	-.187	-.214	.062

United States

	Overall Fit Indices						Comparative Fit Indices					
	χ^2	*df*	CFI	TLI	RMSEA	SRMR	Model Comparison	$\Delta\chi^2$	Δdf	ΔCFI	ΔTLI	ΔRMSEA
1. 20-item 1-factor	2799.25	170	.729	.697	.129 (.125, .134)	.085						
2. 15-item 1-factor	2089.96	90	.718	.671	.155 (.149, .161)	.103	1 vs 3	2400.86***	86	-.239	-.263	.075
3. 15-item 4-factor	308.30	84	.968	.960	.054 (.047, .060)	.044	2 vs 3	1018.49***	6	-.250	-.289	.101

Note. Along with a $\chi 2$ difference test using the Santorra-Bentler scaling correction (Satorra, 2000; Satorra & Bentler, 2001), we relied on the model comparison criteria of ΔRMSEA ≤.015 (increase indicates worst fit; Chen, 2007) and ΔCFI/ΔTFI ≤.01 (decrease indicates worst fit; Cheung & Rensvold, 2002) to compare the adequacy of a single factor of rumination (both 20-item and 15-item versions) (Brinker & Doziois, 2009) with a 15-item 4-factor model based on subscales proposed by Tanner et al., (2013). ****p*<.001.

Table 2

Measurement invariance testing results of the 15-item 4-factor RTSQ across countries and sex

Across Countries

	Overall Fit Indices						Comparative Fit Indices					
	χ^2	*df*	CFI	TLI	RMSEA	SRMR	Model Comparison	$\Delta\chi^2$	Δdf	ΔCFI	ΔTLI	ΔRMSEA
1. Configural	994.19	252	.953	.942	.074 (.069, .078)	.051						
2. Metric	1040.08	274	.952	.945	.072 (.067, .076)	.055	1 vs 2	45.89**	22	-.001	.003	-.002
3. Scalar	1220.89	296	.942	.938	.076 (.071, .080)	.061	2 vs 3	180.81***	22	-.010	-.007	.004

Across Sex

	Overall Fit Indices						Comparative Fit Indices					
	χ^2	*df*	CFI	TLI	RMSEA	SRMR	Model Comparison	$\Delta\chi^2$	Δdf	ΔCFI	ΔTFI	ΔRMSEA
1. Configural	916.67	168	.951	.939	.074 (.069, .079)	.049						
2. Metric	929.23	179	.951	.942	.072 (.067, .076)	.050	1 vs 2	12.56	11	.000	.003	-.002
3. Scalar	959.60	190	.950	.944	.071 (.066, .075)	.051	2 vs 3	30.37**	11	-.001	.002	-.001

Note. We used comparison criteria of ΔRMSEA ≤.015 (increase indicates worst fit; Chen, 2007) and ΔCFI/ΔTFI ≤.01 (decrease indicates worst fit; Cheung & Rensvold, 2002) to test for measurement invariance. * p<.05. ** p<.01. *** p<.001.

Table 3

Correlations between the four latent rumination factors and composite scores of study variables across countries

	Problem-Focused Thoughts			Counterfactual Thinking			Repetitive Thoughts			Anticipatory Thoughts		
	U.S.	Arg	Sp	U.S.	Arg	Sp	U.S.	Arg	Sp	U.S.	Arg	Sp
Problem-focused Thoughts	---	---	---									
Counterfactual Thinking	**.55**	**.57**	**.60**	---	---	---						
Repetitive Thoughts	**.57**	**.63**	**.71**	**.77**	**.56**	**.60**	---	---	---			
Anticipatory Thoughts	**.71**	**.74**	**.64**	**.72**	**.71**	**.68**	**.70**	**.69**	**.63**	---	---	---
Premeditation	-.06$_{a}$	-.02$_{a}$	.01$_{a}$	**.21$_{a}$**	.13$_{a}$	.06$_{a}$	**.20$_{a}$**	.13$_{a}$	.12$_{a}$	.07$_{a}$	-.01$_{a}$	.06$_{a}$
Perseverance	**-.33$_{a}$**	**-.34$_{a}$**	**-.27$_{a}$**	-.00$_{a}$	**-.15$_{ab}$**	**-.25$_{b}$**	.02$_{a}$	-.12$_{a}$	-.10$_{a}$	**-.17$_{a}$**	**-.31$_{a}$**	**-.23$_{a}$**
Sensation Seeking	-.07$_{a}$	-.03$_{a}$	-.02$_{a}$	.00$_{a}$	.03$_{a}$	.03$_{a}$	.01$_{a}$	-.00$_{a}$	.06$_{a}$	.08$_{a}$	.07$_{a}$	.15$_{a}$
Positive Urgency	**.34$_{a}$**	**.36$_{a}$**	**.34$_{a}$**	.06$_{a}$	**.26$_{a}$**	**.27$_{a}$**	.02$_{a}$	**.17$_{a}$**	**.20$_{a}$**	**.20$_{a}$**	**.32$_{a}$**	**.31$_{a}$**
Negative Urgency	**.47$_{a}$**	**.46$_{a}$**	**.47$_{a}$**	**.22$_{a}$**	**.32$_{a}$**	**.35$_{a}$**	**.25$_{a}$**	**.35$_{a}$**	**.38$_{a}$**	**.36$_{a}$**	**.45$_{a}$**	**.44$_{a}$**
Openness	-.07$_{a}$	-.10$_{ab}$	**-.30$_{b}$**	**.17$_{a}$**	**.15$_{a}$**	-.05$_{a}$	**.23$_{a}$**	.05$_{ab}$	-.04$_{b}$	**.17$_{a}$**	.14$_{a}$	.02$_{a}$
Extraversion	**-.21$_{a}$**	**-.33$_{a}$**	**-.31$_{a}$**	-.08$_{a}$	**-.16$_{a}$**	**-.29$_{a}$**	-.04$_{a}$	**-.17$_{a}$**	-.16$_{a}$	-.06$_{a}$	**-.24$_{ab}$**	**-.31$_{b}$**
Agreeableness	**-.19$_{a}$**	**-.18$_{a}$**	**-.27$_{a}$**	-.03$_{a}$	-.08$_{ab}$	**-.33$_{b}$**	-.02$_{a}$	-.04$_{a}$	**-.20$_{a}$**	-.07$_{a}$	**-.21$_{ab}$**	**-.39$_{b}$**
Conscientiousness	**-.37$_{a}$**	**-.31$_{a}$**	**-.24$_{a}$**	**-.07$_{a}$**	**-.21$_{a}$**	**-.21$_{a}$**	-.05$_{a}$	-.11$_{a}$	-.11$_{a}$	**-.26$_{a}$**	**-.38$_{a}$**	**-.34$_{a}$**
Emotional Stability	**-.56$_{a}$**	**-.55$_{a}$**	**-.60$_{a}$**	**-.39$_{a}$**	**-.34$_{a}$**	**-.47$_{a}$**	**-.47$_{a}$**	**-.53$_{a}$**	**-.62$_{a}$**	**-.45$_{a}$**	**-.46$_{a}$**	**-.52$_{a}$**
Depressive Symptoms	**.58$_{a}$**	**.59$_{a}$**	**.45$_{a}$**	**.31$_{a}$**	**.39$_{a}$**	**.42$_{a}$**	**.36$_{a}$**	**.48$_{a}$**	**.44$_{a}$**	**.38$_{a}$**	**.50$_{a}$**	**.44$_{a}$**
Sex	**.11$_{a}$**	.12$_{a}$	.03$_{a}$	**.10$_{a}$**	.03$_{a}$	-.03$_{a}$	**.12$_{a}$**	**.18$_{a}$**	.11$_{a}$	**.12$_{a}$**	.15$_{a}$	.07$_{a}$

Note. U.S.=United States (n = 924); Arg=Argentina (n = 403), Sp=Spain (n = 305). Sex was coded -.5=male, .5=female. Significant correlations (p<.01) are in bold typeface for emphasis. Values across subscales sharing a subscript in a row indicate correlations that are not significantly different from each other based on Fisher r-to-z transformations (Bonferroni correction: p<.00034).

Appendix A
Items in Spanish Version of the 15-item RTSQ

Subscale	RTSQ Items- Spanish Version
RT (1)	Encuentro que mi mente le da vueltas a las cosas una y otra vez
RT (2)	Cuando tengo un problema, atormentará mi mente durante mucho tiempo
RT (3)	Encuentro que algunos pensamientos me vienen a la mente una y otra vez durante todo el día
RT (4)	No puedo dejar de pensar sobre algunas cosas
CFT (5)	Cuando anticipo una interacción social, imagino cada posible situación y conversación previamente
CFT (6)	Tiendo a rememorar acontecimientos pasados tal y como me hubiera gustado que hubieran sucedido
CFT (8)	Sueño despierto sobre cosas que quisiera haber hecho
CFT (7)	Cuando siento que he tenido una mala interacción con alguien, tiendo a imaginar varias situaciones donde hubiese actuado de forma distinta
PFT (9)	Cuando trato de solucionar un problema complicado, suelo volver al principio una y otra vez, sin nunca encontrar una solución
PFT (11)	Nunca he podido desviar la atención de pensamientos indeseados
PFT (12)	Incluso si pienso en un problema durante horas, me cuesta mucho llegar a tener una idea clara del mismo
PFT (13)	Me resulta muy difícil llegar a una solución clara sobre algunos problemas, no importa cuánto piense sobre ello
PFT (14)	A veces me doy cuenta de que no he hecho nada más que pensar en algo durante horas
AT (17)	Cuanto estoy esperando que ocurra algo que me gusta mucho, aparecen pensamientos sobre esto que interfieren en lo que estoy haciendo
AT (18)	Algunas veces incluso durante una conversación, tengo otros pensamientos en mi cabeza

Note. RT= Repetitive Thoughts; CFT = Counterfactual Thinking; PFT = Problem-focused Thoughts; AT = Anticipatory Thoughts. The numbers in parentheses refer to the item number of the English RTSQ.

Supplemental Table 1

Demographics and descriptive statistics of non-RTSQ study constructs across countries

	United States (*n*=924)	Argentina (*n*=403)	Spain (*n*=305)
Sex	n (%)	n (%)	n (%)
Men	227 (30.0)	175 (43.4)	87 (28.5)
Women	639 (69.2)	228 (56.6)	218 (71.5)
Missing	8 (0.9)	0 (0.0)	0 (0.0)
Age *M* (*SD*)	21.98 (6.33)	22.55 (4.17)	21.03 (4.08)
Education			
First Year (Freshman)	271 (29.3)	91 (22.6)	49 (16.1)
Second Year (Sophomore)	168 (18.2)	99 (24.6)	175 (57.4)
Third Year (Junior)	216 (23.4)	64 (15.9)	26 (8.5)
Four Year (Senior)	266 (28.8)	53 (13.2)	45 (14.8)
Fifth Year	----------	60 (14.9)	2 (0.7)
Finished Studies (Graduating)	----------	36 (8.9)	8 (2.6)
Graduate Student	2 (0.2)	----------	----------
Missing	1 (0.1)	0 (0.0)	0 (0.0)
Non-RTSQ Study Constructs	*M* (*SD*) [α]	*M* (*SD*) [α]	*M* (*SD*) [α]
Premeditation	3.14 (0.50) [α=.86]	3.01 (0.41) [α=.75]	2.90 (0.44) [α=.79]
Perseverance	3.07 (0.50) [α=.82]	2.95 (0.49) [α=.80]	3.04 (0.48) [α=.83]
Sensation Seeking	2.72 (0.63) [α=.87]	2.51 (0.61) [α=.83]	2.56 (0.60) [α=.85]
Positive Urgency	1.90 (0.67) [α=.94]	1.95 (0.52) [α=.85]	1.90 (0.47) [α=.83]
Negative Urgency	2.26 (0.62) [α=.88]	2.45 (0.47) [α=.71]	2.32 (0.47) [α=.75]
Openness	3.74 (0.66) [α=.80]	3.89 (0.68) [α=.82]	3.79 (0.66) [α=.82]
Extraversion	3.49 (0.77) [α=.85]	3.42 (0.81) [α=.86]	3.54 (0.81) [α=.86]
Agreeableness	3.51 (0.60) [α=.72]	3.61 (0.55) [α=.68]	3.77 (0.58) [α=.73]
Conscientiousness	3.56 (0.68) [α=.81]	3.42 (0.67) [α=.79]	3.53 (0.70) [α=.83]
Emotional Stability	2.93 (0.80) [α=.86]	2.93 (0.80) [α=.84]	3.10 (0.84) [α=.87]
Depressive Symptoms	15.18 (10.75) [α=.91]	15.59 (9.96) [α=.89]	11.98 (8.57) [α=.88]

Note. One-way ANOVAs revealed significant differences across countries on sex [F(2,1621)=12.99, $p<.001$, partial $\eta 2=.02$] and age [F(2,1614)=6.65, $p=.001$, partial $\eta 2=.01$]. Post-hoc comparisons using a Bonferroni correction indicated that the percentage of female participants in Argentina (56.6%) is significantly different (i.e., smaller) than both the U.S. (69.2%; Hedge's g = 0.28) and Spain (71.5%; Hedge's g = 0.29). There was no significant difference between Spain and the U.S. on percentage of female participants. Post-hoc comparisons using a Bonferroni correction indicated that participants in Spain (*M*=21.03) are significantly different (i.e., younger) than both the U.S. (*M*=21.98; Hedge's g = 0.16) and Argentina (*M*=22.55; Hedge's g = 0.37). There was no significant difference between Argentina and the U.S. on age of participants.