Psychological Inflexibility Mediates the Effects of Self-Efficacy and Anxiety Sensitivity on Worry

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Abstract. Recent research has found low levels of general self-efficacy (GSE: beliefs about the ability to appropriately handle a wide range of stressors) and high levels of anxiety sensitivity (AS: fear of the negative consequences of experiencing anxiety) to be relevant predictors of pathological worry. This study examined the role of psychological inflexibility (PI: the dominance of private experiences over chosen values and contingencies in guiding action), the central component of the acceptance and commitment therapy model of psychopathology, in the effect of GSE and AS on worry. A total of 132 nonclinical participants completed questionnaires assessing the constructs of interest. Partial correlations and regression analyses showed that both GSE and AS were independent predictors of pathological worry after controlling for each other. However, mediation analyses revealed that psychological inflexibility completely mediated the independent effects of both GSE and AS on pathological worry. Theoretical and treatment implications of the results are discussed.

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Worry consists of repetitive thoughts that are experienced as unpleasant and that concern an uncertain future outcome that is considered undesirable (e.g., Berenbaum, 2010). It represents one of the most evolved types of behavior, because it allows us to anticipate possible future danger, experiment with ideas, and consider and evaluate alternative choices before implementing one of them. However, excessive worry can also be a source of distress and is the central feature of generalized anxiety disorder (GAD), which tends to be a chronic disorder that leads to significant functional impairment, is associated with high rates of comorbidity, and is difficult to treat, as a large proportion of individuals treated with cognitive behavioral therapy do not improve significantly, and rates of relapse are high (e.g., Waters & Craske, 2005).

Several factors have been associated with the development and maintenance of pathological worry (see a review in Berenbaum, 2010). One of such factors is general self-efficacy (GSE; also called perceived competence) that is defined as beliefs about the ability to appropriately handle a wide range of stressors. According to Berenbaum (2010), it seems reasonable that low levels of GSE make more probable the perception of threat that would initiate worry. In fact, GSE has shown negative correlations with worry in a good number of studies. For instance, Berenbaum, Thompson, and Bredemeier (2007) showed that lower levels of self-efficacy were associated with higher levels of worry, and that this relationship was mediated by perceived probabilities of undesirable outcomes.

Another factor that has been associated with pathological worry is anxiety sensitivity (AS), which could be defined as the tendency to perceive anxious states as aversive and harmful (Reiss & McNally, 1985). As measured by the Anxiety Sensitivity Index (ASI: Peterson & Reiss, 1992), anxiety sensitivity is a multidimensional construct that consists of three factors: fears of physical, cognitive, and social aspects of anxiety. Research has shown that AS may serve as precursor to avoidant behavior and has consistently related it to anxiety disorders, especially panic disorder. Specifically, Floyd, Garfield, and LaSota (2005) found that AS was a significant predictor of worry even after controlling for overall distress. Other studies have found that cognitive concerns of AS had strong and nonredundant associations with GAD (e.g., Rector, Szacun-Shimizu, & Leybman, 2007).

During the past years, several contextual cognitive behavioral therapies have been proposed for the treatment of GAD, including acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 1999). In our view, the ACT model of psychopathology and behavioral ineffectiveness, which emphasizes the pernicious role of experiential avoidance and psychological inflexibility, is especially well suited to provide an understanding

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and treatment of pathological worry (e.g., Roemer & Orsillo, 2002).

Experiential avoidance (EA) refers to the occurrence of deliberate efforts to avoid and/or escape from private events such as affects, thoughts, memories, and bodily sensations which are experienced as aversive, even when doing so leads to actions that are inconsistent with one's values and goals (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). Research strongly supports the notion that pathological worry serves an experiential avoidance strategy in response to perceived future threats (e.g., Borkovec, 1994; Roemer & Orsillo, 2002).

During the past few years, the ACT model has proposed psychological inflexibility as a broader concept that contains experiential avoidance because it involves negative private experiences but also neutral and positive ones (e.g., Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Psychological inflexibility (PI) entails the dominance of private experiences over chosen values and contingencies in guiding action (Bond et al., 2011). There is presently a huge amount of empirical evidence supporting the maladaptive role of PI/EA in a wide range of psychological disorders, health conditions, and task performance (e.g., Hayes et al., 2006; Ruiz, 2010). Accordingly, the aim of ACT is to promote psychological flexibility, defined as the ability to be in contact with the private experiences that surface in the present moment without needing to avoid and/or escape from them, and to adjust the behavior according to what the situation requires in order to pursue valued ends (e.g., Hayes et al., 2006).

The ACT model of GAD emphasizes the central role of EA/PI in its development and maintenance. From this perspective, the lack of ability to be in contact with fear and anxiety could lead to the use of worry as an experiential avoidance strategy that would be negatively reinforced due to the short-term reduction of these experiences, and positively reinforced when the person follows rules that emphasize the need of getting rid of fear and anxiety. Through repeated practice, a pattern of worrying in response to fear is shaped and becomes generalized. However, worry is only effective in the short term because, due to the characteristics of language and cognition, fear returns in the long term, provoking further engagement with worry, which begins to occupy an important part of life (Hayes et al., 1996). In this situation, worry itself usually becomes a source of suffering and another experience to avoid, which may paradoxically increase its frequency, trapping the person in a cycle of experiential avoidance (Roemer & Orsillo, 2002).

Some initial research supports the ACT model of GAD. Roemer, Salters, Raffa, and Orsillo (2005) found that PI/EA was related to GAD and pathological worry in both a nonclinical and a clinical sample.

Santanello and Gardner (2007) showed that PI/EA mediated the relationship between maladaptive perfectionism and worry. Several studies have also provided empirical evidence that ACT, or acceptance-based treatments largely based on ACT, are promising treatments for GAD (see reviews in Ruiz, 2010, 2012).

The ACT model of GAD may shed some light on the nature of the effects of GSE and AS on pathological worry. Individuals with low levels of GSE might have higher tendency to perceive uncertain future outcomes in response to demanding events whereas individuals with high AS might be more concerned about probably stressful situations. Both types of individuals are likely to develop pathological levels of worry to the extent that they are psychologically inflexible because they rigidly use worry as an experiential avoidance strategy in response to fear and anxiety.

To investigate these relationships, questionnaires assessing these constructs were administered to 132 nonclinical participants. We predicted significant zero-order correlations among all these variables. We also predicted that both GSE and AS would remain significantly related to pathological worry even when controlling for each other. Finally, we hypothesized that PI/EA would significantly mediate the effects of both GSE and AS on pathological worry.

Method

Participants

The sample consisted of 132 participants with an age range of 18 to 69 years (M = 33.56, SD = 12.88) from the province of Almería (Southeast of Spain). Sixty-three percent were women. The relative educational level of the participants was as follows: 65% had graduated from college or were currently taking university coursework, 20% had graduated from mid-level studies, and 15% had completed primary studies.

Instruments

Penn State Worry Questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990)

The PSWQ is a 16-item, 5-point Likert scale, self-report instrument that was designed to evaluate the permanent and unspecific degree of worry that characterizes GAD. Examples of items are "My worries overwhelm me" and "I know I should not worry about things, but I just cannot help it." The PSWQ internal consistency is high, within an alpha range between .93 and .95, and it shows good test-retest reliability and discriminant validity. We administered the translation into Spanish by Sandín, Chorot, Valiente, and Lostao (2009), which showed similar properties to the original PSWQ version and mean scores of 49.8 (*SD* = 12.6).

General Self-Efficacy Scale (GSES; Schwarzer & Jerusalem, 1995)

The GSES is a 10-item, 4-point Likert scale that aims to measure people's belief about their ability to cope with a wide range of stressors. Examples of items are "I can always manage to solve difficult problems if I try hard enough" and "I am confident that I could deal efficiently with unexpected events." The GSES has shown good internal consistency, with alpha values between .79 and .93, and a one-factor solution. The Spanish translation by Baessler and Schwarzer (1996), which showed similar psychometric properties to the original scale, was used. The mean score found in several studies is approximately 31.

Anxiety Sensitivity Index (ASI; Peterson & Reiss, 1992)

The ASI is a 16-item, 5-point Likert scale that aims to measure AS. Participants rate the extent to which they expect negative consequences from a variety of anxietyrelated experiences, including physical (e.g., "When I notice my heart beating rapidly, I worry that I might have a heart attack"), cognitive (e.g., "When I cannot keep my mind on a task, I worry that I might be going crazy"), and social concerns (e.g., "It is important to me not to appear nervous"). The Spanish adaptation of the ASI has good psychometric properties in clinical and normal populations, an adequate factor structure, and convergent and discriminant validity (e.g., Sandín, Chorot, & McNally, 2001). The mean scores found in nonclinical population were 19.7 (SD = 9.2) for the complete scale, 8.8 (SD = 5.3) for physical concerns, 3.5 (SD = 3.3) for cognitive concerns, and 7.2 (SD = 2.9)for social concerns.

Acceptance and Action Questionnaire - II (AAQ-II; Bond et al., 2011)

The AAQ-II is a general measure of experiential avoidance and psychological inflexibility. It consists of 7 items that are rated on a 7-point Likert scale. The items reflect unwillingness to experience unwanted emotions and thoughts (e.g., "I am afraid of my feelings," "I worry about not being able to control my worries and feelings") and the inability to be in the present moment and carry out value-directed actions when experiencing psychological events that could undermine them (e.g., "My painful experiences and memories make it difficult for me to live a life that I would value," "My painful memories prevent me from having a fulfilling life," "Worries get in the way of my success"). Recent studies have shown that the AAQ-II has better psychometric properties and a clearer factor structure than the first AAQ version (Bond et al., 2011). The Spanish translation carried out by Ruiz, Langer,

Luciano, Cangas, and Beltrán (2013) was used in this study, which has shown a one-factor solution, good internal consistency (mean α = .88), and external validity. The mean score found in nonclinical samples was 21.22 (*SD* = 7.76).

Procedure

Participants were recruited from undergraduate psychology and pedagogy students and their personal contacts. Individuals, who signed a general informed consent document, were given a questionnaire packet including the self-report instruments in the order listed above with two additional unvalidated questionnaires about mindfulness, which were presented at the end and have no relevance for the current study. Upon completion of the study, participants were debriefed regarding the aims of the study and thanked for their participation.

Statistical analysis

Our aim was to examine the potential role of psychological inflexibility as a mediator variable of the effects of both general self-efficacy and anxiety sensitivity on pathological worry. First, we computed zero-order relationships among pathological worry (PSWQ), general self-efficacy (GSES), anxiety sensitivity (AS), and psychological inflexibility (AAQ-II). Second, partial correlations were computed to explore whether GSE and AS were associated with pathological worry after controlling for each other. Third, we conducted two mediation analyses using the non-parametric bootstrapping procedure for estimating direct and indirect effects with the single mediator model described by Preacher and Hayes (2004). This method offers greater statistical power relative to both the traditional causal steps approach popularized by Baron and Kenny and the Sobel test, which uses normal theory confidence intervals.

In each mediation analysis, scores on the PSWQ served as dependent variable, scores on the AAQ-II were used as the proposed mediating variable, and age, gender, and educational level were entered as covariates. GSES and ASI scores served as independent variables, respectively, in the first and second mediation analyses. To control for each other, ASI scores entered as an additional covariate in the mediation model for GSE and, conversely, GSES scores were used as a covariate in the mediation analysis for AS. Mediation was deemed significant if the 95% biascorrected and accelerated (BCa) bootstrap confidence intervals (CI) for the indirect effects based on 20,000 bootstrapped samples did not include zero (see Preacher & Hayes, 2004). Additionally, the effect sizes of psychological inflexibility as a mediator of the

effects of GSE and AS on pathological worry were computed using the completely standardized indirect effect (ab_{cs} ; Preacher & Kelly, 2011) and providing 95% BCa bootstrap confidence intervals. This effect size measure relies on the product of betas for paths *a* and *b*, and can be interpreted as the expected change in the dependent variable (i.e., PSWQ scores) per unit change in the predicting variables (i.e., GSES and ASI) that occurs indirectly through the mediator (i.e., AAQ-II). Following Kenny's (2013) suggestion, small, medium, and large effect sizes would be, respectively, .01, .09, and .25.

Results

Preliminary Analyses

Table 1 shows the descriptive data and internal consistencies obtained for each scale in the current study. Participants' mean scores on pathological worry (PSWQ), GSE (GSES), AS (ASI) and psychological inflexibility (AAQ-II) did not differ significantly from the scores obtained with Spanish nonclinical populations in other studies. Very good internal consistencies were found for all scales and subscales, except for social concerns from the ASI ($\alpha = .62$).

Zero-Order Correlations

Table 1 also shows that psychological inflexibility was the variable with the highest correlation with pathological worry (r = .56), followed by AS (r = .40), and GSE (r = -.29). The ASI subscales also showed significant correlations with the PSWQ (r = .34, .35, and .38, respectively, for the physical, cognitive, and social concerns).

As expected, both GSE and AS showed moderate correlations with psychological inflexibility (respectively, r = -.40 and r = .43). With regard to the ASI subscales, the cognitive concerns showed the highest correlation (r = .44), followed by the physical (r = .39) and social concerns (r = .28).

Partial Correlations

Partial correlations indicated that GSE remained significantly correlated with pathological worry (r = -.19, p = .027) after controlling for AS. Conversely, AS also remained significantly correlated with worry (r = .35, p < .001) after controlling for GSE. Likewise, the ASI subscales remained significantly correlated with the PSWQ scores (respectively, .29, .29 and .34, for physical, cognitive and social concerns).

Mediation Analysis of the Effect of GSE on Pathological Worry through Psychological Inflexibility

Table 2 shows that general self-efficacy (independent variable) significantly predicted the proposed mediator variable, i.e., psychological inflexibility (path a: B = -.539, SE = .123, p < .001). Likewise, GSE significantly predicted pathological worry (dependent variable) even with AS entered as a covariate in addition to age, gender, and educational level (path c or total effect: B = -.474, SE = .19, p < .05). However, this effect became nonsignificant when psychological inflexibility was included in the model (path *c*' or direct effect: B = -.131, SE = .188, p = .486). The indirect effect of GSE on pathological worry through PI was significant (path ab), with a point estimate of -.343 (SE = .101) and a 95% BCa CI of -.580 to -.177. The effect size of this indirect effect was medium ($ab_{cs} = -.162$, 95% BCa CI of -.278to -.084). In conclusion, the mediation analysis revealed that psychological inflexibility fully mediated the relationship between GSE and pathological worry.

Mediation Analyses of the Effect of AS on Pathological Worry through Psychological Inflexibility

Table 2 also shows the data concerning the mediation analyses conducted to analyze the mediating role of psychological inflexibility in the effect of overall AS and each of its three factors on pathological worry.

	2	3	4	5	6	7	М	SD	α
1 PSWQ	.56**	29**	.40**	.34**	.35**	.38**	50.5	11.7	.92
2 AAQ-II		40**	.43**	.39**	.44**	.28**	21.0	7.9	.86
3 GSES			30**	26*	26*	25*	30.2	5.6	.87
4 ASI - total				.94**	.87**	.72**	23.6	13.2	.92
5 ASI - physical					.73**	.54**	11.4	7.4	.92
6 ASI - cognitive						.50**	4.3	4.5	.87
7 ASI - social							7.9	3.2	.62

Table 1. Descriptive Data, Internal Consistencies and Correlations

Note: PSWQ: Penn State Worry Inventory; GSES: General Self-Efficacy Scale; ASI: Anxiety Sensitivity Inventory; AAQ-II: Acceptance and Action Questionnaire - II.

 $p < .01. p \le .001.$

Table 2. Data from the Mediation Analyses of the Effects on Pathological Worry of General Self-Efficacy and Anxiety Sensitivity throughPsychological Inflexibility

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Note: DV: dependent variable. **p* < .05. ***p* < .01. ****p* < .001.

With regard to overall AS, the first regression analysis showed that it significantly predicted psychological inflexibility (path *a*: B = .174, SE = .051, p < .001).

Likewise, overall AS significantly predicted pathological worry even when controlling for GSE (path *c* or total effect: B = .238, SE = .079, p < .01). However, this effect

became nonsignificant when controlling for psychological inflexibility (path c' or direct effect: B = .127, SE = .076, p = .095). The indirect effect of overall AS on pathological worry through psychological inflexibility was significant (path ab: point estimate = .111, SE = .045, 95% BCa CI of .034 to .210). The effect size of the indirect effect was medium ($ab_{cs} = .125$, 95% BCa CI of .039 to .237).

Similar results were obtained with the physical and cognitive concerns of AS. Both factors significantly predicted psychological inflexibility (paths a; physical concerns: B = .265, SE = .091, p < .01; cognitive concerns: B = .530, SE = .149, p < .001) as well as pathological worry (paths *c* or total effects; physical concerns: B = .333, SE = .141, p < .05; cognitive concerns: B = .511,SE = .235, p < .05). However, the latter effects became nonsignificant after controlling for psychological inflexibility (paths c' or direct effects; physical concerns: B = .157, *SE* = .132, *p* = .238; cognitive concerns: *B* = .153, *SE* = .225, p = .499), whereas the indirect effects of physical and cognitive concerns on worry through psychological inflexibility were significant (paths ab; physical concerns: *B* = .176, *SE* = .070, 95% BCa CI of .059 to .337; cognitive concerns: point estimate = .358, SE = .165, 95% BCa CI of .045 to .671). The effect sizes of the indirect effect were medium (physical concerns: $ab_{cs} = .113, 95\%$ BCa CI of .037 to .214; cognitive concerns: $ab_{cs} = .137, 95\%$ BCa CI of .017 to .256).

Finally, the social concerns of AS significantly predicted both psychological inflexibility (path *a*: *B* = .426, *SE* = .211, *p* < .05) and pathological worry (path *c* or total effect: *B* = 1.147, *SE* = .311, *p* < .001). The last regression analysis showed that, although social concerns still significantly predicted pathological worry after controlling for psychological inflexibility (path *c*': *B* = .877, *SE* = .287, *p* = .003), the indirect effect of social concerns via psychological inflexibility on worry was also significant (path *ab*: point estimate = .270, *SE* = .147, 95% BCa CI of .023 to .601) and of a small-medium effect size (*ab*_{cs} = .074, 95% BCa CI of .006 to .165).

In conclusion, the mediation analyses carried out revealed that the effect of AS and all its dimensions on pathological worry were significantly mediated by psychological inflexibility.

Discussion

This study examined the hypothesis that the effects of GSE and AS on pathological worry would be mediated by psychological inflexibility. As predicted, even when controlling for each other, both GSE and AS were related to pathological worry. Mediation analyses showed that psychological inflexibility fully mediated the effects of GSE and AS on pathological worry. With regard to specific factors of AS, psychological

inflexibility also fully mediated the effects of both physical and cognitive concerns on worry. A different pattern of results was obtained for social concerns of AS. Although the indirect effect of social concerns via psychological inflexibility on worry was significant, social concerns still significantly predicted worry, which means that psychological inflexibility only partly mediated the effect of social concerns on pathological worry.

Previous studies have found that low levels of GSE and high levels of AS and PI/EA are significant predictors of pathological worry (e.g., Berenbaum et al., 2007; Floyd et al., 2005; Rector et al., 2007; Santanello & Gardner, 2007). This study adds further empirical evidence of these relationships and, most importantly, provides data concerning their nature. First, GSE and AS seem to be independent predictors of pathological worry. Second, both constructs predict PI/EA. Finally, low levels of GSE and high levels of AS both seem to have an effect on worry by increasing psychological inflexibility/experiential avoidance.

The present study has a major limitation in the crosssectional design used that does not allow determining whether changes in the predictor variables (i.e., GSE and AS) preceded changes in the criterion variable (i.e., pathological worry) because causal relationships among variables cannot be assumed without establishing temporal precedence. Also, and importantly, relations between the variables studied might be bidirectional. For instance, although it makes sense that low perceived self-efficacy to deal with a wide range of stressors and fears of the negative consequence of experiencing anxiety may both lead to increasing experiential avoidance strategies, it is also probable that the long-term negative consequences of experiential avoidance may have an effect both on GSE (i.e., the person confirms his/her poor ability to handle stressors) and AS (i.e., the person actually experiences the negative consequences of anxiety). In this sense, it seems logical to assume that the variables studied might form a loop that receives positive feedback and has psychological inflexibility/experiential avoidance as its central component. Accordingly, future research should explore whether psychological inflexibility might have an effect on GSE and AS by increasing the level of maladaptive worry and other anxiety-related experiences.

Additional limitations of this study are worth mentioning. First, because all data in the current study were obtained using self-report measures, relationships among variables might be artificially inflated. Second, as the sample was composed of nonclinical participants, the generalizability of the current findings may be limited. Accordingly, future studies should examine the mediating role of psychological inflexibility in populations with clinical levels of pathological worry (e.g., individuals with GAD). Third, the social concerns of the ASI showed poor internal consistency. Because research has found that the ASI contains numerous items with unacceptable psychometric properties (Blais et al., 2001), further research should use the Anxiety Sensitivity Index-Revised (Taylor & Cox, 1998), which seems to solve this problem and may be particularly useful in research on AS dimensions and their relations with psychopathology.

If further study replicate and extend the present findings, this would strongly support the ACT model of GAD. This model emphasizes the central role of experiential avoidance and psychological inflexibility in the development and maintenance of GAD. From this perspective, the inability to be in contact with fear and anxiety while performing valued actions could lead to the use of worry as an experiential avoidance strategy. Worry is then negatively reinforced due to the immediate reduction of these aversive experiences and positively reinforced when the person follows rules that underline the need of getting rid of fear and anxiety in order to avoid fatal consequences. In this way, a pattern of worrying in response to fear is shaped and becomes generalized. However, this pattern is only effective in the short term because in the long term, due to the characteristics of language and cognition, fears are extended and return in a boomerang effect, provoking further engagement with worry (e.g., Hayes et al., 1996). Ironically, worry itself usually becomes a source of suffering and another experience to avoid, which may paradoxically increase its frequency, trapping the person in a cycle of experiential avoidance that perpetuates negative internal experiences (Roemer & Orsillo, 2002). According to this analysis, the aim of ACT in the treatment of GAD is to promote behavioral flexibility in dealing with fear and anxiety so that the person can be in contact with them, without needing to avoid them, and simultaneously engage in valued actions.

Importantly, the ACT model of GAD does not conceive low levels of GSE and high levels of AS as directly provoking pathological levels of worry. On the one hand, individuals with low levels of GSE seem to have higher tendency to perceive uncertain future outcomes in response to demanding events. On the other hand, individuals who fear their response to anxiety symptoms (i.e., AS) might be more concerned about probable stressful situations. Both types of individuals are likely to develop pathological levels of worry to the extent that they are psychologically inflexible because they rigidly use worry as an experiential avoidance strategy in response to fear and anxiety. This hypothesis seems correct, in view of the results of the present study.

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