



## Short Communication

# The moderating role of positive beliefs about worry in the relationship between stressful events and worry

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## ABSTRACT

Some theorists suggest that worry is elevated by positive beliefs when stressful events occur. Although several cross-sectional studies have revealed an association between positive beliefs and worry, few longitudinal studies have been conducted on this topic. Moreover, the effect of positive beliefs as a moderator on worry when stressful events occur has not been investigated. Against this background, the present study conducted a two-wave longitudinal survey to examine the moderating role of positive beliefs. One hundred and ninety-four college students voluntarily completed questionnaires. Hierarchical regression analysis showed a prospective relationship between the experience of stressful events and the subjective report of worry. Moreover, this relationship was moderated by an interaction with positive beliefs; stressful events were a stronger predictor of the extent of worry for individuals with a high level of positive beliefs than for those with a low level of positive beliefs. The moderating role of positive beliefs suggests that the level of positive beliefs amplifies the threat of worry caused by stressful events.

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## 1. Introduction

Most people have experienced worry about future problems. Although worry is repetitive thought accompanied by negative affect, worry is an attempt to engage in problem solving (Borkovec, Robinson, Pruzinsky, & DePree, 1983). The positive aspects of worry, such as the notion that ‘worry is useful’ or ‘worry prevents bad things happening’, have drawn the attention of some theorists and have found a place in cognitive models about worry and generalized anxiety disorder (GAD), which is characterized by excessive worry (for a review, see Behar, DiMarco, Hekler, Mohlman, & Staples, 2009). In some of these models, it is assumed that positive beliefs promote the use of worry as a problem-solving strategy when stressful events, which are a trigger for worry, occur (Borkovec, Alcaine, & Behar, 2004; Dugas, Gagnon, Ladouceur, & Freeston, 1998). Metacognitive models of worry (Wells, 1995) have pointed out that positive beliefs contribute to worrying as a coping strategy for dealing with a threat.

The empirical studies that have confirmed the relationship between worry and positive beliefs are correlational or quasi-experimental and compare a clinical group and a control group (e.g. Borkovec & Roemer, 1995). In many of the studies using a questionnaire, a positive correlation is found between worry and positive beliefs; however, almost all of these studies are cross-sectional (e.g. Davis & Valentiner, 2000). Their ability to investigate a causal association is limited. Using prospective analyses, Sica,

Steketee, Ghisi, Chiri, and Franceschini (2007) investigated the relationship between metacognitive beliefs and worry, using the Self-Regulatory Executive Function (S-REF) model (Wells & Matthews, 1994) and in accordance with the theory that negative beliefs about worry, such as ‘worry is uncontrollable’, are strongly associated with a pathological trait of worry. The S-REF model is characterized by reciprocal associations between automatic processing; voluntary processing, which includes worry; and self-beliefs, and proposes that worry is driven by metacognitive beliefs. Results of previous studies have indicated that negative beliefs were found to predict worry; however, contrary to the theoretical models, positive beliefs were not (Sica et al., 2007).

However, this study examined only the direct effects of positive beliefs on worry. According to the theoretical models of worry, it is assumed that positive beliefs are a moderator in the strategic use of worry. Moreover, another recent study revealed that metacognition with positive beliefs moderates the relationship between perceived stress and negative emotion (Spada, Nikcevic, Moneta, & Wells, 2008). Therefore, investigating only the direct effect of metacognitive beliefs is not sufficient to grasp the relationship between these beliefs and worry. However, the effect of positive beliefs as moderator has never been investigated.

In this context, the present study examines the effect of positive and negative beliefs as moderators by using a two-wave longitudinal survey. The hypothesis tested is that the level of positive beliefs will predict the extent to which stressful events predict worry. To our knowledge, this is the first study to investigate the moderating role of positive beliefs.

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**Table 1**  
Descriptive statistics and correlations ( $n = 194$ ).

	<i>M (SD)</i>	1	2	3	4
<i>Time 1 variables</i>					
1 WQD	43.16 (–18.37)				
2 MCQ positive beliefs	13.86 (4.25)	.30**			
3 MCQ negative beliefs	12.29 (4.01)	.58**	.25**		
<i>Time 2 variables</i>					
4 WQD	39.33 (18.44)	.76**	.19**	.44**	
5 Stressful events	9.84 (4.84)	.40**	.10	.27**	.53**

Note: WQD = Worry Domain Questionnaire; MCQ = Metacognitions Questionnaire-30.

\*\*  $p < .01$ .

## 2. Method

### 2.1. Participants

The participants were 194 undergraduates (53 female) who were recruited from the introductory psychology course at the University of Tokyo and agreed to participate in our survey. Their mean age was 19.3 years ( $SD = 1.21$ ; range = 18–30).

### 2.2. Measures

#### 2.2.1. Worry domain questionnaire (WDQ; Tallis, Eysenck, & Mathews, 1992)

The WDQ is a 25-item measure assessing the amount of worry associated with various content areas (e.g. relationships, finances). Items are rated on a 5-point scale. The total score (0–100) is computed by summing the items of the inventory; this score provides a general indication about the frequency of worries. The Japanese version of the WDQ showed good internal consistency for the total scale ( $\alpha = .90$ ), and its test–retest reliability coefficient at five weeks was .59–.70 (Suzuki, 2004).

#### 2.2.2. Metacognitions questionnaire-30 (MCQ-30; Wells & Cartwright-Hatton, 2004)

Positive and negative beliefs about worry were assessed using the MCQ-30. Although the MCQ-30 assesses five dimensions of metacognition on separate subscales, only two factors were used for this analysis: (1) positive beliefs about worry and (2) negative beliefs about uncontrollability of thoughts and danger. Each

contains six items. Items are rated for agreement on a 4-point scale, with higher scores indicating higher levels of metacognitions. The Japanese version created by Yamada and Tsuzi (2007) was used; its internal consistency is high ( $\alpha = .83$ , for positive beliefs;  $\alpha = .76$ , for negative beliefs).

#### 2.2.3. Stressful events

Stressful events were assessed using the list of negative events on the Scale of Life Events in Interpersonal and Achievement Domains (Takahira, 1998). This scale consists of 30 descriptions of life events that students might experience in daily social interactions and achievement-related activities (e.g. being ignored by others, getting a bad grade on a test). The participants were asked to indicate whether they had experienced such events during the interval between each assessment on a 2-point scale (yes = 1; no = 0). The number of positive responses was used as an indicator of the stress experienced during the intervals. This scale has good internal consistency ( $\alpha = .78$ ).

### 2.3. Procedure

Participants completed two packets of questionnaires 4 weeks apart. In order to test the effect of positive beliefs within a prospective framework, participants completed the MCQ-30 and WDQ at the initial assessment (Time 1). At the follow-up assessment (Time 2), they completed the WDQ for the second time and also answered questions about stressful events experienced between Times 1 and 2.

### 2.4. Statistical analysis

The main hypothesis was tested using hierarchical multiple regression analysis for predicting worry at Time 2. As the first step of this analysis (Step 1, covariate model), the regression model included only the covariate variables: baseline worry level assessed at Time 1 and demographic characteristics. Next, in order to examine the prospective effect of positive beliefs, the main effect of the positive and negative beliefs score and the stressful events score were entered in the second step (Step 2, main effect model). In the last step, the interaction between positive beliefs and stressful events was entered (Step 3, interaction model). Prior to these regression analyses, all independent variables were centered to prevent multicollinearity.

**Table 2**  
Hierarchical regression analysis predicting the WDQ score at Time 2.

	Step 1 Covariate model		Step 2 Main effect model		Step 3 Interaction model	
	<i>B (SE)</i>	<i>t</i>	<i>B (SE)</i>	<i>t</i>	<i>B (SE)</i>	<i>t</i>
Covariants						
Gender	2.53(1.94)	1.30	1.49(1.86)	0.80	1.91(1.84)	1.04
Time1 WQD	0.76(0.05)	16.06**	0.66(0.06)	11.13**	0.65(0.06)	11.05**
Main effects						
MCQ positive beliefs			–0.13(0.21)	–0.62	–0.14(0.20)	–0.70
MCQ negative beliefs			0.03(0.25)	0.13	0.08(0.25)	0.33
Stressful events			0.97(0.19)	5.14**	1.03(0.19)	5.44**
Interaction						
MCQ positive beliefs $\times$ Stressful events					0.11(0.05)	2.30*
MCQ negative beliefs $\times$ Stressful events					0.02(0.05)	0.42
Adjusted $R^2$		.57		.62		.63
$\Delta R^2$				.05**		.02**

Note: WQD = Worry Domain Questionnaire; MCQ = Metacognitions Questionnaire-30.

\*  $p < .05$ .

\*\*  $p < .01$ .

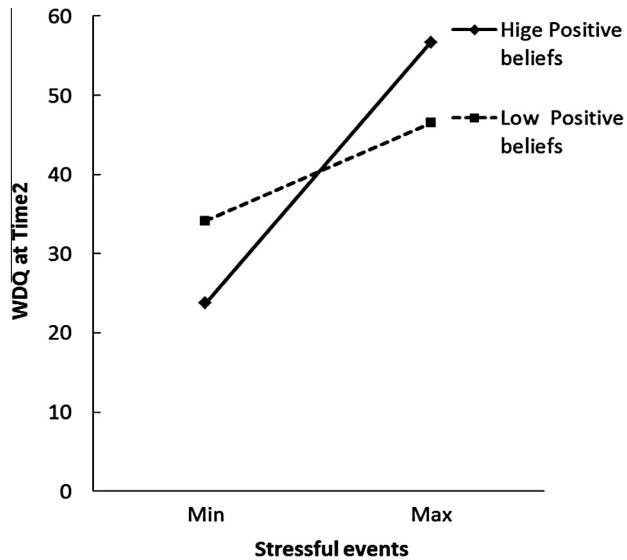


Fig. 1. Conditional associations between the WDQ score at Time 2 and Stressful events for high and low levels of positive beliefs about worry.

### 3. Results

Descriptive statistics and correlations are presented in Table 1. All correlations between variables were significant, except for the relationship of positive beliefs and stressful events. The level of positive beliefs was positively, albeit weakly, correlated with the extent of worry assessed at Times 1 and 2.

In order to investigate the prospective effect of positive beliefs on the extent of worry, a hierarchical regression analysis was conducted (Table 2). The covariate model showed that demographic characteristics were not a significant predictor of worry. Next, the main effect model showed that stressful events, but not positive beliefs and negative beliefs, predicted the Time 2 WDQ score. Finally, in the interaction model, the two-way interactions contributed to a significant increase in  $R^2$  ( $\Delta R^2 = .01$ ,  $F[2, 186] = 2.46$ ,  $p < .05$ ). Thus, the interaction model is reported as the final model (Table 2-2). The results indicated a significant interaction between positive beliefs and stressful events. However, the interaction between negative beliefs and stressful events was not significant.

Since this interaction was significant, the conditional effects (simple slope) of stressful events on worry in subjects with high and low levels of positive beliefs (1 SD above or below the mean) were tested (Aiken & West, 1991). This analysis revealed that stressful events had a significant effect on WDQ score at Time 2 for subjects with both high and low levels of positive beliefs. However, the simple slope of the relationship between Time 2 WDQ score and stressful events was greater when the level of positive beliefs was high ( $B = 1.49$ ,  $SE = 0.28$ ,  $t = 5.28$ ,  $p < .001$ ) than when it was low ( $B = 0.57$ ,  $SE = 0.27$ ,  $t = 2.11$ ,  $p < .05$ ). Using the two equations generated from the regression analyses for the high and low values of positive beliefs, the simple regression slopes for the high and low levels of stressful events (i.e. minimum and maximum values) were plotted (Fig. 1). These findings indicated that individuals who had high levels of positive beliefs seemed to experience greater worry under conditions of high life event stress than under conditions of low stress.

### 4. Discussion

The present study conducted a two-wave longitudinal survey to examine the prospective associations between positive beliefs

about worry and worry. The hypothesis stated that the level of positive beliefs is associated with worry as a moderator of stressful events.

The results suggest a prospective relationship between the experience of stressful events and the subjective report of worry. Stressful events predicted a significant increase in extent of worry at the 4-week follow-up. Moreover, this relationship was qualified by its interaction with positive beliefs. This moderating role of positive beliefs suggests that the level of positive beliefs amplifies the threat of worry caused by stressful events; that is, the experience of stressful events in individuals with higher levels of positive beliefs leads to greater worry than it does in individuals with lower levels of positive beliefs. These results are consistent with some theoretical models of worry or GAD which state that positive beliefs promote the strategic use of worry (Borkovec et al., 2004; Dugas et al., 1998; Wells, 1995).

Additionally, a moderate association between worry and subsequently stressful events, which is not represented by subjective appraisal, was found. According to the S-REF model (Wells & Matthews, 1994), worry elaborates memory representations of the stressor and leads to greater accessibility of threat, which results in the escalation of perceived stress. Thus, worry promotes subsequent worry through increased perception of stress.

From these findings, it is assumed that positive beliefs about worry are the starting point for the development of excessive worry. In the S-REF model (Wells & Matthews, 1994), worry is an important problematic component. Because worry driven by positive beliefs depletes resources for processing information incompatible with dysfunctional beliefs, worry supports the maintenance of dysfunctional beliefs and the selection of maladaptive coping strategies, such as avoidance or thought suppression. These maladaptive coping strategies elicit excessive worry.

The present study supports the effectiveness of existing interventions that focus on positive beliefs about worry. Psychological education and discussions regarding positive beliefs about worry have been introduced in metacognitive therapy (Wells, 2000), a treatment program originally developed to treat GAD. Therapists practicing metacognitive therapy focus on the dysfunctional beliefs in everyday life and do not place emphasis on reducing worry.

### 5. Limitations and conclusion

To the best of our knowledge, the present study is the first to examine the effect of positive beliefs on worry as a moderator to stress; however, it has some limitations. First, the sample was largely male. Although the effect of gender was statistically controlled in the regression analysis, this unbalanced gender distribution might have influenced our results and interpretation of the association between worry and stress because some studies have reported gender differences in our target variables. Those studies report that females have a greater tendency to worry (e.g. Olatunji, Schottenbauer, Rodriguez, Glass, & Arnkoff, 2007) and are more likely to report more severe stress (e.g. Davis, Okun, Kruszewski, Zautra, & Tennen, 2010). In addition, most community epidemiological surveys note a female-to-male ratio for GAD at 2:1 (e.g. Vega-López et al., 2008). Therefore, the pattern of correlation among these variables might differ between males and females; for example, a stronger association between worry and stress. In fact, when the interaction between gender and stressful events was entered into the interaction model, the interaction ( $B = -0.07$ ,  $SE = 0.39$ ,  $t = -0.17$ ,  $ns$ ) was not significant. Thus, the gender difference in the correlational pattern was not confirmed. Second, the assessment of stressful events was unable to capture day-to-day stress and was subject to retrospective recall bias because it included the evaluation of stressful events over the past 4 weeks. The use of more ecologically valid methods, such as daily diaries or

experience sampling (van Eck, Berkhof, Nicolson, & Sulon, 1996), would be helpful for understanding the detailed mechanisms of stress and worry.

In conclusion, the present study adds to research suggesting that positive beliefs about worry have a moderating role in promoting worry when stressful events occur. Despite some limitations, our findings support the cognitive models of worry and GAD. These results are important for understanding the mechanisms underlying the development of excessive worry.

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