Journal of Affective Disorders 340 (2023) 812–819

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research paper

A multi-study examination of the relevance of the metacognitive beliefs about uncontrollability in emotion regulation and clinical symptoms

José M. Salguero [a,*], Juan Ramos-Cejudo [b]

[a] Department of Personality, Evaluation, and Psychological Treatment, University of Malaga, Spain
[b] Department of Psychology, Camilo Jose Cela University, Spain

ARTICLE INFO

Keywords:
Perceived control
Metacognitive beliefs
Emotion regulation
Emotional disorders

ABSTRACT

Transdiagnostic approaches to psychopathology have postulated that factors related to perceived control are particularly relevant to mental health. Here we focused on a specific perceived control-related construct: metacognitive beliefs about uncontrollability. Evidence suggests that dysfunctional metacognitive beliefs play a role in the activation and maintenance of maladaptive emotion regulation strategies and emotional distress. Metacognitive beliefs about the uncontrollability and danger of worry are the most strongly associated with psychopathology. In this multi-study research, we hypothesized that metacognitive beliefs about uncontrollability make a specific contribution to emotion regulation strategies and clinical symptoms. We tested our hypotheses in four different studies, both cross-sectionally and longitudinally ($N = 2224$). Participants completed measures of metacognitive beliefs, maladaptive strategies (e.g., worry, thought suppression), and clinical symptoms (e.g., generalized anxiety, emotional distress, depressive and anxiety symptoms). Our results showed that uncontrollability beliefs were the strongest variable associated with maladaptive emotion regulation strategies and clinical symptoms (cross-sectionally), and the only ones that predicted them in the long term. We discuss the theoretical and clinical implications of these results in the light of the metacognitive model and control-related theories.

Empirical evidence suggests the importance of identifying the transdiagnostic factors that play a role in the onset and/or maintenance of psychopathology (Dalgleish et al., 2020; Harvey et al., 2004). Historically, one such factor is the *perception of control* (Weems and Silverman, 2006). From the early research on locus of control (Rotter, 1954), to more recent approaches about perceived control regarding negative emotions (Barlow et al., 2021; Ford and Gross, 2018), the fear of losing control (Radomsky, 2022), and the metacognitive model (Wells, 2009, 2019), these perceived control-related constructs have proven to be particularly relevant as a determinant of mental health (Chorpita and Barlow, 1998; Gallagher et al., 2014a; Radomsky, 2022).

1. Perceived control and psychopathology

In Chorpita and Barlow's (1998) theoretical framework of control and anxiety, the authors suggested that diminished perceived control is central to the experience of negative emotion. Early experiences with lack of control (mainly in the family environment) contribute to stored information about the controllability or uncontrollability of stressful events, which become relatively fixed beliefs. Over time, these beliefs turn into a cognitive vulnerability factor of negative affect, with individuals with diminished perceived control being more likely to interpret events as uncontrollable and, in turn, experience increased negative emotion and psychophysiological reactions. This initial framework helped lay the foundation for Barlow's (2000, 2002) *triple vulnerability model* in which the author proposed that low perceived control over potentially negative events and emotions is a generalized psychological vulnerability factor that increases the risk of developing an anxiety disorder (Barlow, 2002). More recently, Barlow et al. (2021) reframed their model, focusing mainly on the perception of uncontrollability over negative emotions to explain emotional disorders. When faced with negative emotions (triggered by stressful events), individuals who have a sense of uncontrollability over these emotions tend to use avoidant behavior to reduce their negative state, which eventually can generate an emotional disorder itself. The perception of control over emotions becomes here a central factor in emotional disorders.

The role of perceived control is thus not only significant when individuals face stressful events but also when they face interoceptive

* Corresponding author at: Department of Personality, Evaluation, and Psychological Treatment, School of Psychology, University of Málaga, Campus de Teatinos S/N, 29071 Malaga, Spain.
E-mail address: jmsalguero@uma.es (J.M. Salguero).

https://doi.org/10.1016/j.jad.2023.08.090
Received 6 June 2023; Received in revised form 15 August 2023; Accepted 16 August 2023
Available online 21 August 2023
0165-0327/© 2023 The Author(s). Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

outcomes. In this sense, Ford and Gross (2018) suggested that beliefs about emotion, mainly about their controllability, may help to address emotion regulation efficiently. They predicted that beliefs about emotion uncontrollability would be associated with decreased motivation to practice and persevere with emotion regulation strategies, resulting in a lower ability to regulate emotions. On the other hand, Radomsky (2022), in a fear of losing control framework, posited that beliefs of losing control over *interoceptive domains* (emotions, thoughts, behavior, and physical/bodily sensations) are central in a range of psychological disorders (e.g., anxiety disorders, eating disorders, obsessive-compulsive disorders). Based on this fear of losing control, the individual strives to exert control over their thoughts, emotions, and physiological sensations, engaging in avoidance strategies or safety behaviors that become counterproductive.

Taken together, we can draw some conclusions from these theoretical approaches. First, they emphasize the importance of perceived control as a determinant of emotion regulation and mental health. Second, they point out as predominantly relevant the perception of control over interoceptive domains (e.g., emotions, thoughts). In our view, the perception of control over interoceptive outcomes falls within the scope of metacognition.

2. The metacognitive approach

The experience of cognition has at least two components: the direct experience of one's cognitive content (e.g., thoughts, memories) and the metacognitive experience of these cognitions (Ackerman and Thompson, 2017). Metacognition pertains not to the immediate experience of the cognitions but rather to their reflective experience, involving their appraisals, monitoring, and control (Wells, 2009). Seminal studies on metacognition in emotional disorders (Wells, 2009, 2019; Wells and Matthews, 1994) have revealed that metacognitive factors are crucial to understanding the continuum between normality and psychopathology.

From a metacognitive model perspective, a psychological disorder is caused by a maladaptive emotion regulation style which involves perseverative thinking (e.g., worry), focused attention, threat monitoring, avoidance, and thought suppression, called *cognitive-affective syndrome* (CAS; Wells, 2009). This syndrome has noxious consequences that lead to psychological disturbances, increasing the accessibility of biased negative information (e.g., negative emotions or negative thoughts) and enhancing and maintaining emotional distress (Wells, 2000). Activation and maintenance of CAS is a function of metacognition, specifically, of stable (dysfunctional) beliefs people have about their own cognitive system and coping strategies, called *metacognitive beliefs*. These metacognitive beliefs, such as positive beliefs about the utility of worry (e.g., "I need to worry in order to remain organized") and negative beliefs about the uncontrollability and danger of thinking (e.g., "My worrying is dangerous for me"), guide the selection and continuous maintenance of unhelpful regulation strategies within a top-down process. Thus, these maladaptive metacognitive beliefs are seen as a transdiagnostic factor of psychopathology (Wells, 2019).

So far, evidence suggests the relevance of metacognitive beliefs both in the use of maladaptive emotion regulation strategies (as indicators of CAS), such as pathological worry, rumination, or thought suppression (e.g., Cano-López et al., 2022; Ramos-Cejudo et al., 2013; Salguero et al., 2019) and in different psychological disorders (for reviews and meta-analyses, see Cano-López et al., 2021, Sun et al., 2017, and Wells, 2019). Moreover, metacognitive beliefs about uncontrollability and danger are the strongest and most robust factors associated with clinical symptoms, such as anxiety and depression (Cano-López et al., 2022; Capobianco et al., 2020; Sun et al., 2017). This finding is consistent with the metacognitive model, which implies that negative beliefs are of great causal significance in psychological disorders because they lead to omnipresent threat from internal processes (e.g., worry), enhancing emotional distress and interfering with effective control (Wells, 2019).

The metacognitive model makes relevant the concept of negative metacognitive beliefs. However, it examines both beliefs about uncontrollability (e.g., "When I start worrying I cannot stop") and beliefs about danger (e.g., "My worrying could make me go mad") together. This fact prevents us from knowing the specific role of metacognitive beliefs about uncontrollability.

3. Metacognitive beliefs about uncontrollability

It is theoretically reasonable to think about uncontrollability and danger beliefs as different factors since they might assess different metacognitive beliefs. In this sense, people can hold beliefs about the uncontrollability of worry independently of their beliefs about the danger of this strategy (and other metacognitive beliefs), and these two types of beliefs might have a specific effect on emotion regulation and emotional distress. For instance, beliefs such as "I am out of control of my own thoughts" could make a specific and more relevant contribution (compared to negative beliefs about danger, and other metacognitive beliefs) to the prediction of emotion regulation strategies (e.g., CAS). According to this, beliefs about uncontrollability are hypothesized to play a role across most psychological disorders, whereas beliefs about danger might be specifically related to some disorders (Nordahl et al., 2022; Wells, 2009). Indeed, there is evidence supporting the usefulness of considering beliefs about uncontrollability and danger as separate constructs (Cano-López et al., 2021; Nordahl et al., 2022) where uncontrollability beliefs about rumination are more related to criterion measures of depression, rumination, and worry than danger beliefs (Cano-López et al., 2021).

Taken together, the theoretical and empirical research suggest that metacognitive beliefs about uncontrollability are a specific construct with a significant contribution to the prediction of emotion regulation strategies (e.g., CAS) and clinical issues. However, no studies to date have tested this.

4. The present research

The main goal of the present multi-study research was to examine the relevance of metacognitive beliefs about uncontrollability in emotion regulation strategies and clinical symptoms. We addressed this goal in four different studies using both cross-sectional and longitudinal methodology.

First, we aimed to examine the specific contribution of metacognitive beliefs about uncontrollability on emotion regulation strategies: pathological worry and thought suppression (cross-sectionally; Study 1) and maladaptive emotional regulation strategies (cross-sectionally and longitudinally; Study 2). Based on the literature, we expected that metacognitive beliefs about uncontrollability would be positively associated with maladaptive emotion regulation strategies with a specific contribution to them, both cross-sectionally and longitudinally. We also expected that the magnitude of the associations between these beliefs and these strategies would be stronger when compared with other metacognitive beliefs.

Second, we aimed to examine the specific contribution of uncontrollability beliefs on clinical symptoms: generalized anxiety symptoms (cross-sectionally; Study 1), emotional distress (cross-sectionally and longitudinally; Study 2), and depressive and anxiety symptoms (cross-sectionally and longitudinally; Study 3). We expected that metacognitive beliefs about uncontrollability would be positively associated with clinical symptoms with a specific contribution to them, both cross-sectionally and longitudinally. We also expected that the magnitude of the associations between uncontrollability beliefs and clinical symptoms would be stronger compared with the other metacognitive beliefs.

Finally, to test whether metacognitive beliefs about uncontrollability and danger are separate factors, we re-examined the factor structure of the Metacognitions Questionnaire, 30 items (MCQ-30; Wells and Cartwright-Hatton, 2004), analyzing the fit of a six-factor structure that considers uncontrollability and danger beliefs as different subscales. To

compare this six-factor structure with the original five-factor one we used a composite sample from studies 1 through 4. Considering recent results in the literature (Cano-López et al., 2021; Nordahl et al., 2022), we expected that the six-factor structure of the MCQ-30 would have a better fit than the original five-factor structure.

5. Method

5.1. Participants and procedure

To test our hypotheses, we gathered a set of four samples (coming from four different studies conducted in different years) that are part of an extensive line of research focused on metacognitive beliefs we carried out from 2010 to the present in Spain. Specifically, we used a sample composed of 2224 Spanish individuals (66.3 % female, 33.5 % male, 0.2 % missing value) from the general population, ranging in age from 18 to 82 years ($M = 31.11$, $SD = 13.21$), who completed self-report measures of metacognitive beliefs, emotion regulation, and clinical symptoms. The characteristics of each study are as follows.

5.1.1. Study 1

The sample consisted of 768 individuals (69.9 % females, 31.1 % males), ranging in age from 18 to 81 ($M = 31.82$, $SD = 13.03$), who completed measures of metacognitive beliefs, pathological worry, thought suppression, and symptoms of generalized anxiety disorder. This sample was part of a large project whose results have been previously published (Ramos-Cejudo et al., 2013; Salguero et al., 2019).

5.1.2. Study 2

The sample consisted of 400 individuals (66.2 % female, 33.6 % male, 0.2 % missing value), ranging in age from 18 to 66 ($M = 30.75$, $SD = 11.93$), who completed self-report measures of metacognitive beliefs, maladaptive emotion regulation strategies, and emotional distress. Of the participants, 143 (68.5 % females, 31.5 % males) aged between 18 and 66 years ($M = 31.39$, $SD = 12.60$) completed the measures 4 months later in a second wave (Time 2 follow-up).

5.1.3. Study 3

The sample consisted of 427 individuals (74.5 % female, 24.8 % male, 0.7 % missing value), ranging in age from 18 to 70 ($M = 25.64$, $SD = 12.35$), who completed self-report measures of metacognitive beliefs and depression and anxiety symptoms. Of the participants, 184 (81 % female, 17.9 % male, 1.1 % missing value) aged between 18 and 60 ($M = 22.74$, $SD = 9.9$) completed again the same measures of clinical symptoms in a second wave, 5 months after the first administration. This sample came from a larger project whose results were previously published (Cano-López et al., 2021).

5.1.4. Study 4

The sample consisted of 629 individuals (56.9 % females), ranging in age from 18 to 82 ($M = 34.62$, $SD = 13.36$), who completed a measure of metacognitive beliefs. This sample came from a larger project whose results were previously published (Salguero et al., 2020).

The same procedure was used in the four studies described. We used a convenience sampling method to recruit Spanish participants (undergraduate students and non-students from the general population). Undergraduate students were invited to participate through lectures, announcements, and emails. Non-student participants were recruited using a snowball sampling procedure through various media, including online, social media, and community websites. Participation was voluntary and anonymous. Exclusion criteria were being under 18 years of age and having difficulties in reading and understanding the questionnaires. The questionnaires were administered in a paper and pencil format (Study 1) or electronically (studies 2–4), with instructions given in writing. The ethical review boards at Spanish universities granted approval for these studies.

5.2. Measures

5.2.1. Metacognitions Questionnaire, 30 (MCQ-30; Wells and Cartwright-Hatton, 2004)

This measure assesses individual differences in metacognitive beliefs. It is comprised of five subscales with a total of 30 items. Responses to each item on the MCQ-30 are on a 4-point Likert scale, from 1 = "Do not agree" to 4 = "Strongly agree." MCQ-30 scores range from 30 to 120 points, and higher scores indicate greater maladaptive metacognitive beliefs. The five subscales measure the following dimensions: (a) positive beliefs about worry (e.g., "Worrying helps me cope"), (b) negative beliefs of uncontrollability and danger (e.g., "When I start worrying I cannot stop"), (c) cognitive confidence (e.g., "My memory can mislead me at times"), (d) the need to control thoughts (e.g., "Not being able to control my thoughts is a sign of weakness"), and (e) cognitive self-consciousness (e.g., "I pay close attention to the way my mind works"). In this study, we separated negative beliefs into two different subscales: uncontrollability (e.g., "My worrying thoughts persist, no matter how I try to stop them") and danger (e.g., "My worrying could make me go mad"), with three items in each subscale. The MCQ has been found to be a reliable measure and demonstrates good convergent and divergent validity (Wells and Cartwright-Hatton, 2004). The Spanish version of the MCQ-30 (Ramos-Cejudo et al., 2013) showed the same factor structure and good reliability, validity, and internal consistency. The Cronbach's alpha values in the present study are displayed in Supplementary Table 1.

5.2.2. Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990)

This instrument captures the generality, excessiveness, and uncontrollability of pathological worry. The reliability and validity of the PSWQ have been widely researched, and the instrument appears to have sound psychometric properties (Brown et al., 1992; Starcevic et al., 2007). It consists of 16 items (five inversely formulated), and responses are given with a 5-point scale from 1 = "Nothing" to 5 = "A lot." The Spanish version of the PSWQ (Sandín et al., 2009) removed the five inversely formulated items from the original version, and it consists of 11 items. This version has shown good reliability, validity, and internal consistency. In the present study, the Cronbach's alpha value was 0.93.

5.2.3. White Bear Suppression Inventory (WBSI; Wegner and Zanakos, 1994)

This inventory has 15 items that measure people's general tendency to suppress thoughts; responses range from 1 = "Totally disagree" to 5 = "Completely agree." It has shown good internal consistency ($\alpha = 0.89$) and test-retest reliability ($r = 0.80$). The present study used the Spanish version of the WBSI (Fernández et al., 2004), which has also shown adequate psychometric properties. In the present study, Cronbach's alpha was 0.92.

5.2.4. Cognitive Emotion Regulation Questionnaire, Short Version (CERQ-S; Garnefski and Kraaij, 2006)

This questionnaire measures the frequency with which people use different emotion regulation strategies when they are experiencing a stressful situation. The emotion regulation strategies measured are organized into two categories: adaptive and maladaptive emotion regulation strategies (Holgado-Tello et al., 2018). In this study we used the maladaptive emotion regulation strategies index that is composed of four subscales (made up of two items rated on a 5-point Likert scale, where 1 = "Almost never" and 5 = "Almost always"): self-blame (e.g., "I feel that I am the one who is responsible for what has happened"), rumination (e.g., "I often think about how I feel about what I have experienced"), catastrophizing (e.g., "I keep thinking about how terrible what I have experienced is"), and blaming others (e.g., "I feel that basically the cause lies with others"). Higher scores on the maladaptive emotion regulation strategies index indicate more frequent use of these strategies. Both the original scale ($\alpha = 0.68$–0.81; Garnefski and Kraaij,

2006) and the Spanish adaptation (α = 0.62–0.90; Holgado-Tello et al., 2018) have shown good psychometric properties. In the present study, Cronbach's alpha was 0.78 for the cross-sectional sample and 0.74 for Time 2.

5.2.5. Screening Scale Generalized Anxiety Disorder (SSGAD; Carroll and Davidson, 2000) According to DSM-IV

This scale consists of 12 dichotomous-response (yes/no) items for participants to indicate whether they sense each item most days in the last 6 months. The items assess the main symptoms following a diagnosis of generalized anxiety disorder (GAD) according to DSM-IV criteria (e.g., "Most days I feel nervous"). Because the assessment of worry and emotional symptoms remains unchanged in DSM-V (compared to DSM-IV), findings with the SSGAD might also be useful for DSM-V. This instrument has shown adequate internal consistency (α = 0.82). The Spanish version of the scale (Bobes et al., 2006) showed adequate reliability (the Kuder–Richardson coefficient = 0.85 in patients with a GAD diagnosis) and validity, confirming its discriminant capacity between patients and controls (sensitivity = 0.94, specificity = 0.95) and adequate sensitivity to change. In the present study, Cronbach's alpha was 0.83.

5.2.6. Depression, Anxiety, and Stress Scale, 21 Items (DASS-21; Lovibond and Lovibond, 1995)

The DASS-21 assesses anxiety (e.g., "I was worried about situations in which I might panic and make a fool of myself"), depression (e.g., "I felt downhearted and blue"), and stress severity (e.g., "I found it hard to wind down"). The DASS-21 ask participants rank the presence of symptoms from each psychopathological dimension during the past week using a 4-point Likert scale (0 = "Does not apply to me at all" to 3 = "Applies to me very much or most of the time"). Higher scores on any of the three scales represent more severe symptomatology. Both the original scale (α = 0.87–0.94; Antony et al., 1998) and the Spanish adaptation (α = 0.73–0.81; Fonseca-Pedrero et al., 2010) have good psychometric properties. In the present study, Cronbach's alpha was 0.91 for the cross-sectional sample and 0.93 for Time 2.

5.2.7. Patient-Reported Outcomes Measurement Information System, Depression Domain (PROMIS-D; Cella et al., 2007)

The PROMIS is an eight-item self-report measure that appraises the severity of depressive symptomatology (e.g., "I felt that I have nothing to look forward to"). Responses range from 1 = "Never" to 5 = "Always," so the total score varies from 8 to 40. Findings showed good psychometric properties and validity in both the original and the Spanish version of PROMIS (Cella et al., 2007; Vilagut et al., 2019). In this study, the Cronbach's alpha value was 0.95 for the cross-sectional sample, and for the longitudinal sample Cronbach's alpha was 0.94 for Time 2.

5.2.8. Patient-Reported Outcomes Measurement Information System, Anxiety Domain (PROMIS-A; Cella et al., 2007)

The PROMIS is an eight-item self-report measure that appraises the severity of anxiety symptomatology (e.g., "I felt nervous"). Responses range from 1 = "Never" to 5 = "Always," so the total score varies from 8 to 40. Findings showed good psychometric properties and validity in both the original and the Spanish version of PROMIS (Cella et al., 2007; Vilagut et al., 2019). In this study, Cronbach's alpha was 0.94 for the cross-sectional sample and 0.94 for Time 2.

5.3. Overview of our data analytic approach

We used both IBM's SPSS, version 25, for computing descriptive statistics, internal consistency, correlation, and regression analyses and Mplus, version 8 (Muthén and Muthén, 1998–2017) to compute confirmatory factor analysis (CFA). First, we examined the associations between metacognitive beliefs about uncontrollability and the other metacognitive beliefs with measures of emotion regulation strategies and clinical symptoms by calculating Pearson's correlations. Second, we performed regression analyses with the cross-sectional and longitudinal samples to examine the specific contribution of metacognitive beliefs about uncontrollability in emotion regulation strategies and emotional symptoms, running each key variable independently. In cross-sectional samples, the key variable was included as the outcome; sex and age were included in Step 1, and in Step 2 we included the other metacognitive beliefs. In longitudinal samples, the key variables at Time 2 were included as the outcome; key variable at Time 1, sex and age were included in Step 1, and metacognitive beliefs in Time 1 were included in Step 2. Third, we used CFA to test the fit of the five-factor and six-factor models of the MCQ-30.

We carried out our CFA using the maximum likelihood method with standard errors and a mean-adjusted chi-square test statistic that is robust to non-normality (MLM). According to Schweizer's (2010) recommendations, additional measures of model fit were used, including (a) root mean square error of approximation (RMSEA), (b) the Bentler comparative fit index (CFI), and the (c) standardized root mean square residual (SRMR). For the CFI, values exceeding 0.90 signify an acceptable fit. For the RMSEA, values below 0.08 are considered an acceptable fit, whereas values below 0.05 indicate a good fit. Finally, SRMR values are expected to stay below 0.10 (Schweizer, 2010).

6. Results

6.1. Descriptive analyses of the MCQ-30 subscales in the total sample

Descriptive statistics and reliability of the different MCQ-30 subscales in the total sample (N = 2224) are shown in Supplementary Table 1. The Cronbach's alpha values of the two negative beliefs subscales were 0.80 for uncontrollability and 0.69 for danger; although the alpha for the danger subscale was under 0.70, it could be considered adequate considering that this subscale contained only three items (Loewenthal, 2001).

6.2. The specific contribution of uncontrollability beliefs on emotion regulation strategies

Table 1 shows the correlational results among metacognitive beliefs and emotion regulation strategies. All the metacognitive beliefs were positively and significantly correlated with pathological worry, thought suppression, and a general index of maladaptive emotion regulation strategies (assessed with the CERQ-S). However, the highest magnitude of correlations was found for metacognitive beliefs about uncontrollability. Table 2 shows the regression analyses results from the cross-sectional samples.

The results revealed that positive, uncontrollability, and danger beliefs had a specific contribution to pathological worry, with the magnitude of these effects being higher for uncontrollability, in line with our correlation analyses. Regarding thought suppression, beliefs about danger, uncontrollability, the need to control thoughts, and cognitive self-consciousness showed a specific contribution; again, metacognitive beliefs about uncontrollability had the highest magnitude effect. Similar results were found for the general index of maladaptive emotion regulation strategies: higher levels of uncontrollability, the need to control thoughts, and cognitive self-consciousness were specifically related to a higher frequency of use of maladaptive strategies. Table 3 shows the results of our regression analyses for the longitudinal samples. The longitudinal model was significant for uncontrollability but not for other metacognitive beliefs. Participants who reported higher levels of uncontrollability beliefs at Time 1 were more likely to report a more frequent use of maladaptive strategies at Time 2 (β = 0.32), and this effect remained significant even after controlling for the key variable at Time 1.

Table 1
Bivariate correlations between metacognitive beliefs, emotion regulation strategies, and clinical symptoms in cross-sectional and longitudinal samples.

	Cross-sectional							Longitudinal			
	Pathological worry (Study 1; $n = 768$)	Thought suppression (Study 1; $n = 768$)	Maladaptive emotion regulation strategies (Study 2; $n = 400$)	Generalized anxiety disorder symptoms (Study 1; $n = 768$)	Emotional distress (Study 2; $n = 400$)	Depressive symptoms (Study 3; $n = 427$)	Anxiety symptoms (Study 3; $n = 427$)	Maladaptive emotion regulation strategies, Time 2 (Study 2; $n = 143$)	Emotional distress, Time 2 (Study 2; $n = 143$)	Depressive symptoms, Time 2 (Study 3; $n = 182$)	Anxiety symptoms, Time 2 (Study 3; $n = 182$)
Positive beliefs about worry	0.35**	0.24**	0.26**	0.23**	0.13*	0.24**	0.21**	0.18*	0.15	0.11	0.15*
Negative beliefs: Danger	0.42**	0.47**	0.38**	0.44**	0.45**	0.49**	0.50**	0.30**	0.41**	0.35**	0.42**
Negative beliefs: Uncontrollability	0.64**	0.59**	0.51**	0.55**	0.51**	0.54**	0.56**	0.60**	0.56**	0.40**	0.49**
Cognitive confidence	0.29**	0.16**	0.29**	0.19**	0.30**	0.19**	0.16*	0.26**	0.27**	0.06	0.05
Need to control thoughts	0.22**	0.47**	0.45**	0.34**	0.35**	0.50**	0.45**	0.44**	0.36**	0.28**	0.31**
Cognitive self-consciousness	0.26**	0.45**	0.44**	0.30**	0.23**	0.34**	0.35**	0.29**	0.15	0.20**	0.20**

** $p < .01$.
* $p < .05$.

6.3. The specific contribution of metacognitive beliefs about uncontrollability on clinical symptoms

Results of our correlation analyses between metacognitive beliefs and clinical symptoms are shown in Table 1. All the metacognitive beliefs were positively and significantly related to symptoms of generalized anxiety disorder, emotional distress, depression, and anxiety, with the magnitude of these correlations being highest for metacognitive beliefs about uncontrollability. The regression analyses on our cross-sectional samples (see Table 2) showed that both metacognitive beliefs about uncontrollability and danger had a specific effect on the different clinical symptoms; again, with the effect of uncontrollability being of the highest magnitude. On the other hand, cognitive confidence had a specific effect on emotional distress and the need to control thoughts on depressive and anxiety symptoms. Looking at the results of the regression analyses on our longitudinal samples (Table 3), the longitudinal models were significant for uncontrollability but not for other metacognitive beliefs. People with higher scores on metacognitive beliefs about uncontrollability at Time 1 were more likely to report higher levels of clinical symptoms at Time 2, even after controlling for the key variable at Time 1, with β ranging from 0.16 to 0.21.

6.4. Confirmatory factor analysis of the six-factor structure of the MCQ-30

We first tested the fit indices of the five-factor model, corresponding to the original structure of the MCQ-30. The fit indices were as follows: $\chi2 = 2443.08$, $df = 395$, $p < .01$; RMSEA = 0.05 (0.04–0.05); CFI = 0.91; SRMR = 0.05. Then, we tested the six-factor model in which two separated negative beliefs (uncontrollability and danger) were considered: The fit indices were: $\chi2 = 1929.02$, $df = 390$, $p < .01$; RMSEA = 0.04 (0.04–0.05); CFI = 0.93; SRMR = 0.04. Globally, these indices indicate that both models demonstrated a good fit to the data. However, the six-factor models showed a better fit, and this difference was significant: $\Delta\chi2(5) = 475.60$, $p < .01$. Factor loadings of both models are displayed in Supplementary Table 2.

7. Discussion

In this study we examined the relevance of metacognitive beliefs about uncontrollability in emotion regulation strategies and clinical symptoms through four different studies, using both cross-sectional and longitudinal approaches. We expected that metacognitive beliefs about uncontrollability would have a specific contribution to maladaptive emotion regulation strategies and clinical symptoms, and that the effect on these outcomes would be stronger compared with the other metacognitive beliefs. Our results are in line with these predictions.

Looking at maladaptive strategies, we found a consistent pattern of results for the strategies assessed. While different metacognitive beliefs were positively and significantly associated with them, the magnitude of these associations was higher for metacognitive beliefs about uncontrollability, and they predicted maladaptive strategies in the long term (4 to 5 five months later) above others. Our data suggest the relevance of metacognitive beliefs about uncontrollability in understanding why people tend to use maladaptive emotion regulation strategies, such as pathological worrying or thought suppression. There are different ways through which the belief that our worry is not under our control can interfere with effective emotion regulation. On the one hand, these beliefs could lead to a threatening interpretation of worry that increases negative emotions and thoughts associated with them. On the other hand, this general sense of threat about our worry can lead people to choose avoidance strategies (e.g., thought suppression, rumination) in an (ineffective) attempt to reduce negative emotions and/or regain perceived control over them. Finally, because these maladaptive strategies fail to reduce negative thoughts and emotions, they can eventually reinforce the beliefs that one's worry is not controllable, resulting in

Table 2
Regression analyses of metacognitive beliefs on emotion regulation strategies and clinical symptoms in cross-sectional samples.

	Pathological worry (Study 1; n = 768)			Thought suppression (Study 1; n = 768)			Maladaptive emotion regulation strategies (Study 2; n = 400)		
	R2	*F*	β	R2	*F*	β	R2	*F*	β
Step 1	0.04	17.54		0.01	5.12		0.02	5.64	
Sex			−0.20**			−0.12**			0.05
Age			0.70			0.03			−0.16**
Step 2	0.49	92.04		0.44	77.72		0.41	35.73	
Positive beliefs about worry			0.20**			−0.04			0.05
Negative beliefs: Danger			0.16**			0.17**			0.06
Negative beliefs: Uncontrollability			0.50**			0.38**			0.29**
Cognitive confidence			−0.04			−0.01			0.10*
Need to control thoughts			−0.05			0.13**			0.16*
Cognitive self-consciousness			0.04			0.17**			0.24**

	Generalized anxiety disorder symptoms (n = 768)			Emotional distress (n = 400)			Depressive symptoms (n = 427)			Anxiety symptoms (n = 427)		
	R2	*F*	β	R2	*F*	β	R2	*F*	β	R2	*F*	β
Step 1	0.02	8.66		0.03	6.69		0.04	11.04		0.06	13.75	
Sex			−0.15			0.02			−0.01			−0.10*
Age			0.01			−0.18**			−0.22**			−0.22**
Step 2	0.34	68.47		0.36	29.01		0.41	38.47		0.42	39.18	
Positive beliefs about worry			0.05			−0.01			0.04			0.01
Negative beliefs: Danger			0.22**			0.25**			0.21**			0.23**
Negative beliefs: Uncontrollability			0.40**			0.33**			0.30**			0.34**
Cognitive confidence			0.05			0.14*			0.06			0.04
Need to control thoughts			−0.02			0.01			0.21**			0.13*
Cognitive self-consciousness			0.02			0.04			−0.02			0.04

** $p < .01$.
* $p < .05$.

Table 3
Regression Analyses in Longitudinal Samples Showing the Amount of Variance in Maladaptive Emotion Regulation Strategies and Clinical Symptoms at Time 2 Accounted for by Initial Levels of Variables at Time 1.

	Maladaptive emotion regulation strategies (n = 143)			Emotional distress (n = 143)			Depressive symptoms (n = 182)			Anxiety symptoms (n = 182)		
	R2	*F*	β	R2	*F*	β	R2	*F*	β	R2	*F*	β
Step 1	0.45	39.14		0.44	38.26		0.35	33.65		0.43	46.47	
Time 1 variable			0.67**			0.66**			0.58**			0.63**
Sex			0.04			−0.10			−0.14*			−0.09
Age			−0.02			0.01			−0.06			−0.09
Step 2	0.50	16.93		0.49	16.11		0.36	12.35		0.46	17.95	
Positive beliefs about worry			0.02			0.05			0.01			0.07
Negative beliefs: Danger			−0.13			0.06			0.11			0.14
Negative beliefs: Uncontrollability			0.32**			0.21**			0.16*			0.19**
Cognitive confidence			0.03			0.07			−0.02			−0.05
Need to control thoughts			0.10			0.02			−0.06			−0.08
Cognitive self-consciousness			0.01			0.02			−0.11			−0.09

** $p < .01$.
* $p < .05$.

a maladaptive loop. There is evidence from experimental studies that manipulations of beliefs about losing control over thoughts lead to maladaptive strategies (e.g., checking behaviors in anxiety) to restore the sense of control (Gagné and Radomsky, 2017). Future studies are warranted to replicate and extend these results in the context of metacognitive beliefs about uncontrollability.

We found similar results regarding clinical symptoms. When examining the cross-sectional results, both metacognitive beliefs about uncontrollability and danger had a specific association with generalized anxiety disorder symptoms, emotional distress, and clinical symptoms of depression and anxiety. Other metacognitive beliefs also showed specific associations: cognitive confidence was associated with emotional distress, while the need to control thoughts was associated with depression and anxiety symptoms. However, when examining the longitudinal results, only metacognitive beliefs about uncontrollability predicted higher symptoms of emotional distress, depression, and anxiety 4 to 5 months later, controlling for these symptoms at baseline. The relevance of negative beliefs to explain clinical symptoms has been shown consistently in previous studies (Cano-López et al., 2022; Capobianco et al., 2020; Sun et al., 2017) and coheres with the metacognitive model (Wells, 2019). Our results suggest that the effect of negative beliefs on clinical symptoms might be due mainly to metacognitive beliefs about uncontrollability. The link between uncontrollability beliefs and clinical symptoms may be indirect via the maladaptive strategies discussed above. It is possible, moreover, that beliefs about the uncontrollability of worry lead to a general sense of threat from these internal processes that enhance and maintain emotional distress. On the other hand, the continued sense of uncontrollability may evolve into a feeling of helplessness, something that would help to understand the associations between uncontrol beliefs and depressive symptoms.

Finally, to test whether metacognitive beliefs about uncontrollability and danger are separate factors, we re-examined the factor structure of the MCQ-30, testing the fit of a six-factor structure, which separated uncontrollability and danger beliefs into different subscales. The six-factor structure had a better fit to the data than the original five-factor structure. This result is in line with recent findings obtained by Nordahl et al. (2022) and Cano-López et al. (2021) and adds evidence about the usefulness of considering these beliefs as different constructs.

Our results have several implications for theory, assessment, and clinical practice. For years, research has highlighted the role of perceived control-related constructs as determinants of mental health (e.g., Chorpita and Barlow, 1998; Gallagher et al., 2014a; Radomsky, 2022). Different theories have postulated that diminished perceived control over aversive events is central to the experience of negative affect and psychopathology (Barlow, 2002), and the fear and beliefs about losing control over a range of interoceptive domains (e.g., emotions, thoughts, physiology) is implicated in emotional disorders (Barlow et al., 2021; Ford and Gross, 2018; Radomsky, 2022). Our results line up with this research, indicating that metacognitive beliefs about uncontrollability of thoughts and cognitive processes (e.g., worry) play a significant role in emotion regulation and clinical symptoms. From a transdiagnostic perspective, all these findings point to the perceived-control beliefs about interoceptive stimuli as crucial to understanding psychopathology. This approach might benefit from continuing to investigate how these beliefs work to explain disorders, and how they are related to each other. For example, a future investigation might examine the associations between metacognitive beliefs about uncontrollability and proximal beliefs, such as uncontrol beliefs about emotions, which have also been related to emotion regulation and emotional distress (Arbulu et al., 2023).

Regarding clinical practice, treatments could benefit from giving uncontrollability beliefs a central role in therapy. In this respect, there is evidence that metacognitive beliefs about uncontrollability are a mechanism of change in patients with comorbid anxiety treated with metacognitive therapy (Johnson and Hoffart, 2018). Similar results have been found for perceived control over anxiety, with some evidence that perceived control may function as a mechanism of change in cognitive behavior therapy for anxiety disorders (Gallagher et al., 2014b).

Finally, the six-factor structure of the MCQ-30 found here could be used in an assessment routine to both determine what negative metacognitive beliefs are more relevant in the functional analysis of each patient and (based on this assessment) select specific techniques that could be used to reduce each of these beliefs. In this regard, it should be noted that the six-factor structure of the MCQ-30 incorporates separate uncontrol and danger subscales with three items for each subscale. The alpha coefficients found in our results were appropriate (although it was 0.69 for the danger subscale), however it would be worth improving the power of these two subscales by incorporating a larger number of items that might also include more aspects associated with each negative belief.

Although these findings make a useful contribution to the field, several limitations will require further research. First, we used a sample mainly composed of females, which is not representative of Spanish population. This unbalanced sample could affect the results; for example, it is possible that uncontrollable beliefs are more relevant for females than for males. Future studies might test our results using more gender-balanced samples. In addition, our samples are from a single country, so futures studies examining samples from different countries as well as different cultures are needed. Second, we focused on some maladaptive emotion regulation strategies and emotional symptoms. Future research might address the role of these beliefs on other emotion regulation strategies (e.g., avoidance behavior, adaptive strategies), other symptoms previously associated with metacognitive beliefs (e.g., obsessive-compulsive, posttraumatic stress, eating disorders), and other contexts (e.g., physical illness). Third, our participants came from community samples; in addition, we did not include a preliminary screening for psychiatric diseases (e.g., chronic affective or psychotic disorders) or drug consumption, which could affect the results. Future studies might corroborate the six-factor structure found here and the relevance of uncontrol beliefs using clinical samples and controlling for the possible effect of mental health status.

This research shows that metacognitive beliefs about uncontrollability of worry are specific beliefs, different from other negative metacognitive beliefs (e.g., about danger), and they have a relevant role in predicting maladaptive emotion regulation strategies and clinical symptoms. Our findings suggest that uncontrollability beliefs should be considered an important target in the treatment of emotional disorders.

Funding

This study was part of a project funded by the Andalusian Government, Spain (grant number UMA20-FEDERJA-143 y PY20-00155).

CRediT authorship contribution statement

José M. Salguero: Conceptualization, Methodology, Project administration, Data Analysis, Writing – original draft.

Juan Ramos-Cejudo: Conceptualization, Methodology, Project administration, Writing – original draft.

Declaration of competing interest

The authors declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

Acknowledgements

This study was part of a project funded by the Andalusian Government, Spain (grant number UMA20-FEDERJA-143 y PY20-00155).

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jad.2023.08.090.

References

Ackerman, R., Thompson, V.A., 2017. Meta-reasoning: shedding metacognitive light on reasoning research. Trends Cogn. Sci. 21 (8), 607–617. https://doi.org/10.1016/j.tics.2017.05.004.

Antony, M.M., Cox, B.J., Enns, M.W., Bieling, P.J., Swinson, R.P., 1998. Psychometric properties of the 42-item and 21-item versions of the depression anxiety stress scales in clinical groups and a community sample. Psychol. Assess. 10 (2), 176–181. https://doi.org/10.1037/1040-3590.10.2.176.

Arbulu, I., Salguero, J.M., Ramos-Cejudo, J., Bjureberg, J., Gross, J.J., 2023. How negative beliefs about emotion are associated with emotional distress via emotion regulation strategies. Curr. Psychol. https://doi.org/10.1007/s12144-023-04633-x.

Barlow, D.H., 2000. Unraveling the mysteries of anxiety and its disorders from the perspective of emotion theory. Am. Psychol. 55, 1247–1263. https://doi.org/10.1037/0003-066X.55.11.1247.

Barlow, D.H., 2002. Anxiety and its Disorders: The Nature and Treatment of Anxiety and Panic, 2nd edition. The Guilford Press, New York.

Barlow, D.H., Curreri, A.J., Woodard, L.S., 2021. Neuroticism and disorders of emotion: a new synthesis. Curr. Dir. Psychol. Sci. 30 (5), 410–417. https://doi.org/10.1177/09637214211030253.

Bobes, J., García-Calvo, C., Prieto, R., García-García, M., Rico-Villademoros, F., 2006. Propiedades psicométricas de la versión española de la Escala de Detección del Trastorno de Ansiedad Generalizada según DSM-IV de Carroll y Davidson [Psychometric properties of the Spanish version of the Screening Scale for DSM-IV GAD of Carroll and Davidson]. Actas Esp. Psiquiatr. 34, 83–93.

Brown, T.A., Antony, M.M., Barlow, D.H., 1992. Psychometric properties of the Penn state worry questionnaire in a clinical anxiety disorders sample. Behav. Res. Ther. 30 (1), 33–37. https://doi.org/10.1016/0005-7967(92)90093-v.

Cano-López, J.B., Salguero, J.M., García-Sancho, E., Ramos-Cejudo, J., 2021. Testing the metacognitive model of rumination and depression in non-clinical populations: new data about PBRS and NBRS scales. J. Psychopathol. Behav. Assess. 43, 240–250. https://doi.org/10.1007/s10862-020-09828-1.

Cano-López, J.B., García-Sancho, E., Fernández-Castilla, B., Salguero, J.M., 2022. Empirical evidence of the metacognitive model of rumination and depression in

clinical and nonclinical samples: a systematic review and meta-analysis. Cogn. Ther. Res. 46, 367–392. https://doi.org/10.1007/s10608-021-10260-2.
Capobianco, L., Faija, C., Husain, Z., Wells, A., 2020. Metacognitive beliefs and their relationship with anxiety and depression in physical illnesses: a systematic review. PLoS One 15 (9), e0238457. https://doi.org/10.1371/journal.pone.0238457.
Carroll, B.J., Davidson, J.R.T., 2000. Screening Scale for DSM-IV GAD. Copyright, 2000.
Cella, D., Yount, S., Rothrock, N., Gershon, R., Cook, K., Reeve, B., the PROMIS Cooperative Group, 2007. The Patient-Reported Outcomes Measurement Information System (PROMIS): progress of an NIH roadmap cooperative group during its first two years. Med. Care 45, S3–S11. https://doi.org/10.1097/01.mlr.0000258615.42478.55.
Chorpita, B.F., Barlow, D.H., 1998. The development of anxiety: the role of control in the early environment. Psychol. Bull. 124, 3–21. https://doi.org/10.1037/0033-2909.124.1.3.
Dalgleish, T., Black, M., Johnston, D., Bevan, A., 2020. Transdiagnostic approaches to mental health problems: current status and future directions. J. Consult. Clin. Psychol. 88 (3), 179–195. https://doi.org/10.1037/ccp0000482.
Fernández, P., Extremera, N., Ramos, N., 2004. Validity and reliability of the Spanish version of the White Bear Suppression Inventory. Psychol. Rep. 94, 782–784. https://doi.org/10.2466/pr0.94.3.782-784.
Fonseca-Pedrero, E., Paino, M., Lemos-Giráldez, S., Muñiz, J., 2010. Propiedades psicométricas de la Depression Anxiety and Stress Scales-21 (DASS-21) en universitarios españoles [Psychometric properties of the Depression Anxiety and Stress Scales-21 (DASS-21) in spanish undergraduates]. Ansiedad y Estrés 16 (2), 215–226.
Ford, B.Q., Gross, J.J., 2018. Emotion regulation: why beliefs matter. Can. Psychol. 59 (1), 1–14. https://doi.org/10.1037/cap0000142.
Gagné, J.P., Radomsky, A.S., 2017. Manipulating beliefs about losing control causes checking behaviour. J. Obsessive-Compul. Relat. Disord. 15, 34–42. https://doi.org/10.1016/j.jocrd.2017.08.013.
Gallagher, M.W., Bentley, K.H., Barlow, D.H., 2014a. Perceived control and vulnerability to anxiety disorders: a meta-analytic review. Cogn. Ther. Res. 38, 571–584. https://doi.org/10.1007/s10608-014-9624-x.
Gallagher, M.W., Naragon-Gainey, K., Brown, T.A., 2014b. Perceived control is a transdiagnostic predictor of cognitive-behavioral therapy outcome for anxiety disorders. Cogn. Ther. Res. 38, 10–22. https://doi.org/10.1007/s10608-013-9587-3.
Garnefski, N., Kraaij, V., 2006. Cognitive emotion regulation questionnaire—development of a short 18-item version (CERQ-Short). Personal. Individ. Differ. 41, 1045–1053. https://doi.org/10.1016/j.paid.2006.04.010.
Harvey, A.G., Watkins, E., Mansell, W., Shafran, R., 2004. Cognitive Behavioural Processes across Psychological Disorders: A Transdiagnostic Approach to Research and Treatment. Oxford University Press, Oxford.
Holgado-Tello, F.P., Amor, P.J., Lasa-Aristu, A., Domínguez-Sánchez, F.J., Delgado, B., 2018. Two new brief versions of the cognitive emotion regulation questionnaire and its relationships with depression and anxiety. Anales de Psicología 34 (3), 458–464. https://doi.org/10.6018/analesps.34.3.306531.
Johnson, S.U., Hoffart, A., 2018. Metacognitive therapy versus cognitive behavioral therapy: a network approach. Front. Psychol. 9, Article 2382 https://doi.org/10.3389/fpsyg.2018.02382.
Loewenthal, K., 2001. An Introduction to Psychological Tests and Scales. Psychological Press.
Lovibond, P.F., Lovibond, S.H., 1995. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck depression and anxiety inventories. Behav. Res. Ther. 33 (3), 335–343. https://doi.org/10.1016/0005-7967(94)00075-U.
Meyer, T.J., Miller, M.L., Metzger, R.L., Borkovec, T.D., 1990. Development and validation of the Penn State Worry Questionnaire. Behav. Res. Ther. 28, 487–495. https://doi.org/10.1016/0005-7967(90)90135-6.
Muthén, L.K., Muthén, B.O., 1998–2017. Mplus User's Guide, 8th ed. Muthén & Muthén.
Nordahl, H., Anyan, F., Hjemdal, O., Wells, A., 2022. The network structure of dysfunctional metacognition: analysis of the MCQ-30. Acta Psychol. 227, 103622 https://doi.org/10.1016/j.actpsy.2022.103622.
Radomsky, A.S., 2022. The fear of losing control. J. Behav. Ther. Exp. Psychiatry 77, 101768. https://doi.org/10.1016/j.jbtep.2022.101768.
Ramos-Cejudo, J., Salguero, J.M., Cano-Vindel, A., 2013. Spanish version of the Meta-Cognitions Questionnaire 30 (MCQ-30). Span. J. Psychol. 16, E95. https://doi.org/10.1017/sjp.2013.95.
Rotter, J.B., 1954. Social Learning and Clinical Psychology. Prentice-Hall, Englewood Cliffs, NJ.
Salguero, J.M., Ramos-Cejudo, J., García-Sancho, E., 2019. Metacognitive beliefs and emotional dysregulation have a specific contribution on worry and the emotional symptoms of generalized anxiety disorder. Int. J. Cogn. Ther. 12 (3), 179–190. https://doi.org/10.1007/s41811-019-00048-4.
Salguero, J.M., García-Sancho, E., Ramos-Cejudo, J., Kannis-Dymand, L., 2020. Individual differences in anger and displaced aggression: the role of metacognitive beliefs and anger rumination. Aggress. Behav. 46 (2), 162–169. https://doi.org/10.1002/ab.21878.
Sandín, B., Chorot, P., Valiente, R.M., Lostao, L., 2009. Validación española del cuestionario de preocupación PSWQ: Estructura factorial y propiedades psicométricas [Spanish validation of the PSWQ: Factor structure and psychometric properties]. Revista de Psicopatología y Psicología Clínica 14 (2), 107–122. https://doi.org/10.5944/rppc.vol.14.num.2.2009.4070.
Schweizer, K., 2010. Some guidelines concerning the modeling of traits and abilities in test construction. Eur. J. Psychol. Assess. 26 (1), 1–2. https://doi.org/10.1027/1015-5759/a000001.
Starcevic, V., Berle, D., Milicevic, D., Hannan, A., Lamplugh, C., Eslick, G.D., 2007. Pathological worry, anxiety disorders and the impact of co-occurrence with depressive and other anxiety disorders. J. Anxiety Disord. 21 (8), 1016–1027. https://doi.org/10.1016/j.janxdis.2006.10.015.
Sun, X., Zhu, C., So, S.H.W., 2017. Dysfunctional metacognition across psychopathologies: a meta-analytic review. Eur. Psychiatry 45, 139–153. https://doi.org/10.1016/j.eurpsy.2017.05.029.
Vilagut, G., Forero, C.G., Castro-Rodriguez, J., Olariu, E., Barbaglia, G., Astals, M., Alonso, J., 2019. Measurement equivalence of PROMIS depression in Spain and the United States. Psychol. Assess. 31 (2), 248–264. https://doi.org/10.1037/pas0000665.
Weems, C.F., Silverman, W.K., 2006. An integrative model of control: implications for understanding emotion regulation and dysregulation in childhood anxiety. J. Affect. Disord. 91 (2–3), 113–124. https://doi.org/10.1016/j.jad.2006.01.009.
Wegner, D.M., Zanakos, S., 1994. Chronic thought suppression. J. Pers. 62, 615–640. https://doi.org/10.1111/j.1467-6494.1994.tb00311.x.
Wells, A., 2000. Emotional Disorders and Metacognition: Innovative Cognitive Therapy. Wiley.
Wells, A., 2009. Metacognitive Therapy for Anxiety and Depression. Guilford Press.
Wells, A., 2019. Breaking the cybernetic code: understanding and treating the human metacognitive control system to enhance mental health. Front. Psychol. 10, 2621. https://doi.org/10.3389/fpsyg.2019.02621.
Wells, A., Cartwright-Hatton, S., 2004. A short form of the metacognitions questionnaire: properties of the MCQ-30. Behav. Res. Ther. 42, 385–396. https://doi.org/10.1016/S0005-7967(03)00145-5.
Wells, A., Matthews, G., 1994. Attention and emotion: a clinical perspective. Erlbaum.