



It's all about beliefs: Believing emotions are uncontrollable is linked to symptoms of anxiety and depression through cognitive reappraisal and expressive suppression

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Abstract

The aim of this study was to examine the link between personal beliefs about emotion controllability and symptoms of anxiety and depression, with a particular focus on the mediating role of emotion regulation. To date, there has been little research examining the mediating role of cognitive reappraisal or expressive suppression in the link between beliefs about emotion controllability and symptoms of anxiety. Online questionnaires measuring emotion regulation, beliefs about emotion controllability, and depression and anxiety, were completed by 1227 participants ($n=336$ males; $M_{age} = 25.3$, $SD=10.1$; range = 16 to 83 years). The results indicated that perceived control over one's own emotions predicted better psychological health (fewer symptoms of anxiety and depression). This link between beliefs about emotion controllability and psychological health was partially mediated by cognitive reappraisal and expressive suppression, with cognitive reappraisal predicting a reduction in clinical symptoms and expressive suppression predicting an increase in clinical symptoms. These findings suggest that individuals' beliefs about emotion controllability, leads to the use of certain emotion regulation strategies which in turn, have important consequences for psychological health.

Keywords Anxiety · Cognitive reappraisal · Depression · Emotion regulation self-efficacy · Expressive suppression · Emotion controllability · Implicit emotion beliefs

Anxiety and depression are the most prevalent mental health disorders worldwide, and are on the increase (World Health Organization, 2017). These disorders can impair the ability of individuals to live a satisfying life (Kazdin & Blase, 2011; Linder et al., 2020) and have been linked with increased risk of self-injurious and suicidal behaviours (Serafini et al., 2012; Taliaferro & Muchlenkamp, 2015). It is therefore important to establish the determinants of anxiety and depression in order to inform future treatments and intervention efforts.

There is a large and growing body of evidence that links deficits in emotion regulation with a wide range of mental health disorders, including anxiety and depression (see Dryman & Heimberg 2018, for a review). More recently, research has begun to focus on people's beliefs about the extent to which emotions can be controlled, and the role these beliefs play in psychological health (Ford & Gross, 2019). This research indicates that people who believe emotions are relatively uncontrollable have lower levels of well-being (Ortner et al., 2017; Tamir et al., 2007) and increased clinical symptoms of anxiety and depression (De Castella et al., 2013, 2018; Ford et al., 2018; Goodman et al., 2021). It looks like this may be because those who believe they have little control over their emotions are less like to attempt to regulate negative emotions and/or persist in these efforts, which subsequently impacts on their psychological health.

However, it is not yet known whether the specific emotion regulation strategy *cognitive reappraisal* plays a role in mediating the relationship between beliefs about emotion controllability and anxiety in particular. In addition,

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there has been little research looking at the mediating role of the emotion regulation strategy *expressive suppression* in the link between beliefs about emotion controllability and symptoms of both anxiety and depression. Through examining these possible pathways, the current study aims to determine whether the beliefs individuals hold about their emotions might determine the strategies they use to regulate their emotions and their subsequent psychological health.

Beliefs about emotion controllability

According to Dweck (1999), people hold beliefs about the controllability of certain personal characteristics. These beliefs can cover a broad range of abilities and traits such as intelligence (Blackwell et al., 2007), morality (Chiu et al., 1997a, b), personality (Chiu et al., 1997a, b) and emotion (Tamir et al., 2007). These beliefs are called implicit beliefs because they are rarely explicitly stated (Dweck & Leggett, 1988). Past research has found that when people believe a personal trait, such as intelligence, is fixed rather than malleable, they make fewer efforts to make changes or self-regulate (Dweck & Leggett, 1988; Hong et al., 1999). This is because they believe that increasing their effort will not change the outcome of a situation.

Consequently, it has been theorised that people who believe emotions can be controlled will be more motivated to regulate them (Kneeland et al., 2016a, b, c). Furthermore, it has been suggested that an individual's beliefs about the controllability of emotions will impact their choice of strategy according to how early or late the strategy occurs in the emotion-generative process (Tamir et al., 2007). According to this position, those who believe they are able to control their emotions will be more motivated to regulate emotions and therefore engage in strategies which occur early in the emotion-generative process, such as *cognitive reappraisal*. In contrast, individuals who believe that emotions are relatively less controllable might be less proactive in their emotion regulation and thus engage in strategies which occur late in the process, such as *expressive suppression* (Kneeland, Dovidio et al., 2016).

Emotion beliefs, emotion regulation, and psychological health

Prior studies suggest that the relationship between beliefs about emotion controllability and psychological outcomes is mediated by emotion regulation strategies. In their 2013 study, De Castella and colleagues found that cognitive reappraisal mediated the relationship between personal beliefs (which they termed emotion regulation self-efficacy) and

symptoms of depression, stress, self-esteem, and satisfaction with life. Cognitive reappraisal has also been found to mediate the association between emotion controllability beliefs and other indicators of well-being such as positive and negative affect (Ortner et al., 2017). More recently, Vuillier et al., (2021) found that both reappraisal and suppression mediated the link between emotion controllability beliefs and eating psychopathology. However, other studies examining the role of expressive suppression have found it to not be associated with beliefs about the controllability of emotions (Tamir et al., 2007; De Castella et al., 2013) or only negatively associated with emotion beliefs after controlling for other implicit theories (Schroder et al., 2015). Some have suggested that this may be because personal emotion beliefs are a measure of beliefs about emotions rather than behaviours, and as a consequence, they may only target emotion regulation strategies which focus on emotional *experiences* such as cognitive reappraisal, rather than strategies involved in the outward behavioural *expressions* of emotion, such as expressive suppression (Ford et al., 2018).

To date, there has been a paucity of research examining the mediating role of cognitive reappraisal in the relationship between beliefs about emotion controllability and anxiety. Research into emotion beliefs and anxiety is complicated by the fact that there are competing theories regarding possible pathways of association (Kneeland, Dovidio, et al., 2016). One position, consistent with the process model of emotion regulation (Gross, 2015), posits that cognitive reappraisal mediates the relationship between emotion beliefs and anxiety in the same way as it does for depression; that is, individuals who believe that they are able to regulate their emotions will be more likely to engage in proactive emotion regulation strategies such as cognitive reappraisal, which will lead to lower levels of anxiety and depression (Kneeland, Dovidio, et al., 2016). Conversely, a second position considers a key feature of anxiety, namely the tendency to engage in over-active attempts to control emotions and the fear of losing control of emotions (Mennin et al., 2005; Roemer et al., 2005). Using this conceptualisation of anxiety, it is possible that the belief that emotions are relatively uncontrollable may be more beneficial for those prone to anxiety as it may reduce the tendency to engage in over-active attempts to control emotions (Kneeland, Dovidio, et al., 2016). However, evidence suggests that these over-active regulatory attempts are typically associated with expressive suppression, and that individuals with high levels of anxiety use reappraisal as frequently as those with low levels of anxiety (Dryman & Heimberg, 2018). The present study aims to test these competing viewpoints and determine whether cognitive reappraisal mediates the relationship between personal beliefs about emotion controllability

and anxiety in the same way as it mediates the relationship between emotion beliefs and depression.

The current study

This study aims to examine the relationships between personal beliefs about emotion controllability, emotion regulation strategies and symptoms of depression and anxiety. Consistent with prior research, we predicted that individuals who believe emotions are controllable would experience fewer symptoms of both depression and anxiety (Hypothesis 1). We also predicted a positive association between emotion controllability beliefs and cognitive reappraisal but not an association between emotion controllability beliefs and suppression (Hypothesis 2). This is in line with the theory that beliefs about emotions only target emotion regulation strategies focused on emotional experiences such as cognitive reappraisal, rather than strategies involved in the outward behavioural expressions of emotion, such as expressive suppression (Ford et al., 2018). Past studies have also found links between emotion controllability beliefs and cognitive reappraisal but not suppression (e.g., De Castella et al., 2013). On the basis of Gross' (1998) process model and the notion that expressive suppression is a primarily maladaptive emotion regulation strategy, whereas cognitive reappraisal is a largely adaptive emotion regulation strategy, we expected that symptoms of depression and anxiety would be positively associated with expressive suppression but negatively associated with cognitive reappraisal (Hypothesis 3). Finally, in light of prior research demonstrating positive associations between emotion controllability beliefs and cognitive reappraisal, as well as positive associations between cognitive reappraisal and psychological health, we predicted that cognitive reappraisal would mediate the relationship between emotion controllability beliefs and both anxiety and depression (Hypothesis 4). However, as we did not expect an association between emotion controllability beliefs and suppression, we also did not expect suppression to mediate the association between emotion controllability beliefs and symptoms of anxiety and depression (Hypothesis 5).

Methods

Participants and procedure

Participants were recruited online through a link distributed through email and social media (Facebook and Reddit) inviting participants to complete an online questionnaire. An information sheet and consent form were included at

the beginning of the questionnaire. The participants were informed that their participation was voluntary, that they could decide not to answer questions or withdraw at any time, and that their information would be kept confidential. Approval for the project was obtained from the appropriate review committees at the authors' institutions. Our sample comprised 1227 participants, of which 336 identified as male, 880 identified as female, 6 identified as 'other' and 5 respondents withheld their gender. Participants' ages ranged from 16 to 83 ($M=25.3$, $SD=10.1$). All respondents aged 16 or above were included in the study. One respondent reported being under 16 years old; their data were subsequently excluded from the study.

Measures

Personal beliefs about emotion controllability (ER self-efficacy)

Personal beliefs about emotion controllability was assessed using the 4-item *Personal Beliefs About Emotions Scale* (De Castella et al., 2013). This scale is based on the *Implicit Theories of Emotion Scale* (Tamir et al., 2007) with the items reframed in the first-person reflecting personal beliefs about one's personal ability to control or change their emotions (e.g. "If I want to, I can change the emotions that I have"). Participants were asked to rate their agreement on a 5-point Likert scale (strongly disagree; strongly agree). Higher scores indicate the belief that one's own emotions are controllable and lower scores indicate that one's own emotions are relatively uncontrollable. Cronbach's alpha for this scale was 0.79.

Emotion regulation strategies

Cognitive reappraisal and expressive suppression were measured using the *Emotion Regulation Questionnaire* (Gross & John, 2003). This 10-item self-report questionnaire has two scales corresponding to two different ER strategies. The *cognitive reappraisal* scale comprises 6 items (e.g. "When I want to feel less negative emotion, I change the way I'm thinking about the situation") and *expressive suppression* comprises 4 items (e.g. "I control my emotions by not expressing them"). The items are rated on a 7-point Likert scale from *strongly disagree* to *strongly agree*. In the present sample, internal consistency was $\alpha=0.79$ for the cognitive reappraisal subscale and $\alpha=0.73$ for the suppression subscale.

Depression and anxiety symptoms

The *21-item Depression, Anxiety and Stress Scale* (DASS-21; Lovibond & Lovibond 1995) was used to measure symptoms of depression and anxiety. This measure has three subscales, each with seven items. For the purpose of this study, only the depression (e.g. “I felt that life wasn’t worthwhile”) and anxiety (e.g. “I felt scared without any good reason”), subscales were used. Internal consistency was $\alpha=0.85$ for anxiety and $\alpha=0.92$ for depression.

Data analysis

Prior to the main analyses, all variables were examined for missing values. Across all variables, missing data were rare (<6%). Pairwise deletion was used to deal with missing data, this reduced the total sample to 1137. The data were inspected for outliers (standardized residuals greater than ± 3), high leverage points (leverage values < 0.2), and highly influential points (Cook’s Distance > 0.1). As the identified data points appeared to be legitimate observations and not error outliers, these cases were not removed from the analyses.

Preliminary exploratory data analyses found that age and gender were significantly related to all variables except cognitive reappraisal, though these effect sizes were small. Subsequently age and gender were controlled for in all analyses. These results are in line with previous findings regarding gender (Gross & John, 2003) and age (Brummer et al., 2014; Dryman & Heimberg, 2018) in studies of implicit beliefs, psychopathology and emotion regulation. For all other analyses the necessary assumptions were met: homoscedasticity as assessed by visual inspection of a plot of studentized residuals against unstandardized predicted values, independence of residuals as assessed by a Durbin-Watson statistic, and linearity as assessed by partial regression plots and a plot of studentized residuals against predicted values. The assumption of normality was also met on observation of Q-Q plots. In addition, there was no evidence of problematic multicollinearity, as assessed by tolerance values greater than 0.1.

To test whether beliefs about emotion controllability would be related to either anxiety or depression via

cognitive reappraisal or suppression, a separate analysis for each model was conducted. The Preacher & Hayes (2008) PROCESS macro for indirect effects with a bootstrap of 5,000 samples was used and an empirically derived sampling distribution was generated; confidence intervals (CIs) were derived from this distribution and used to test for significance of the indirect effect.

Results

A Pearson’s product-moment correlation was run to assess the relationships between beliefs about emotion controllability, emotion regulation and symptoms of anxiety and depression. Table 1 shows there was a small and significant negative association between beliefs about emotion controllability and anxiety and a moderate and significant negative association between beliefs about emotion controllability and depression, as predicted by Hypothesis (1) There was a moderate and significant positive association between beliefs about emotion controllability and cognitive reappraisal, supporting Hypothesis (2) However, in contrast to our predictions, we found a small and significant negative association between beliefs about emotion controllability and expressive suppression. There was also support for Hypothesis 3, with a small and significant negative association between cognitive reappraisal and anxiety, and a moderate and significant negative association between cognitive reappraisal and depression. Additionally, we found a small and significant positive association between expressive suppression and anxiety and a moderate and significant positive association between expressive suppression and depression.

To address Hypotheses 4 and 5, four separate mediation analyses were carried out. The first analysis assessed the indirect effect of emotion beliefs via cognitive reappraisal on anxiety. The second analysis assessed the indirect effect of emotion beliefs via cognitive reappraisal on depression. The third and fourth analyses assessed the indirect effect of emotion beliefs via expressive suppression on anxiety and then depression. Results indicated that the indirect effect of emotion beliefs via cognitive reappraisal was significant for both anxiety (see Fig. 1) and depression (see Fig. 2) with 95% confidence intervals excluding 0: anxiety ($b = -0.30$,

Table 1 Descriptive Statistics (Mean and Standard Deviation) and Correlations

Variable	M	SD	Correlations				
			1	2	3	4	5
1. Emotion controllability beliefs	3.41	0.88	1	0.35*	-0.09*	-0.28*	-0.34*
2. Cognitive Reappraisal	4.60	1.16		1	-0.04	-0.24*	-0.36*
3. Expressive Suppression	3.94	1.36			1	0.27*	0.35*
4. Anxiety	5.71	4.73				1	0.69*
5. Depression	6.68	5.57					1

Note: M=mean, SD=standard deviation, * = $p < .001$

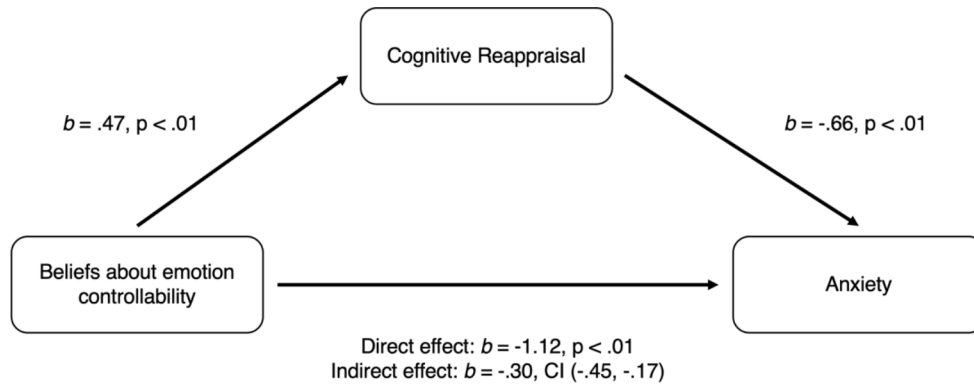


Fig. 1 The Indirect Effect of Beliefs about Emotion Controllability on Symptoms of Anxiety via Cognitive Reappraisal. (Note: All path coefficients represent unstandardized regression weights. The indirect effect of emotion beliefs on anxiety via cognitive reappraisal was significant (95% confidence interval))

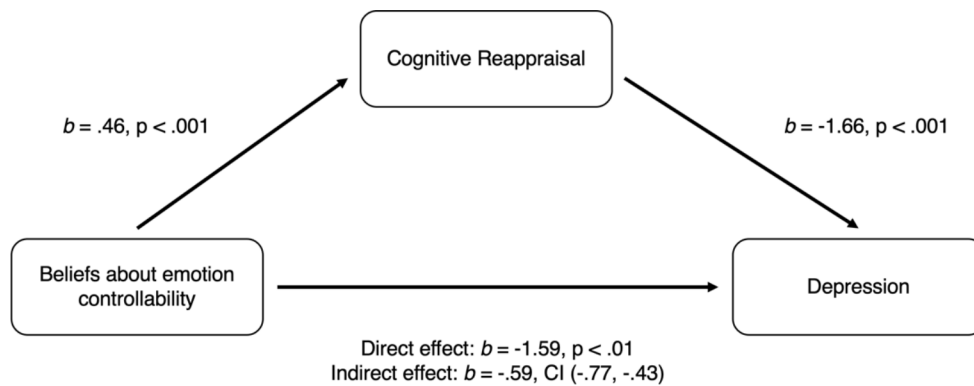


Fig. 2 The Indirect Effect of Beliefs about Emotion Controllability on Symptoms of Depression via Cognitive Reappraisal. (Note: All path coefficients represent unstandardized regression weights. The indirect effect of emotion beliefs on depression via cognitive reappraisal was significant (95% confidence interval))

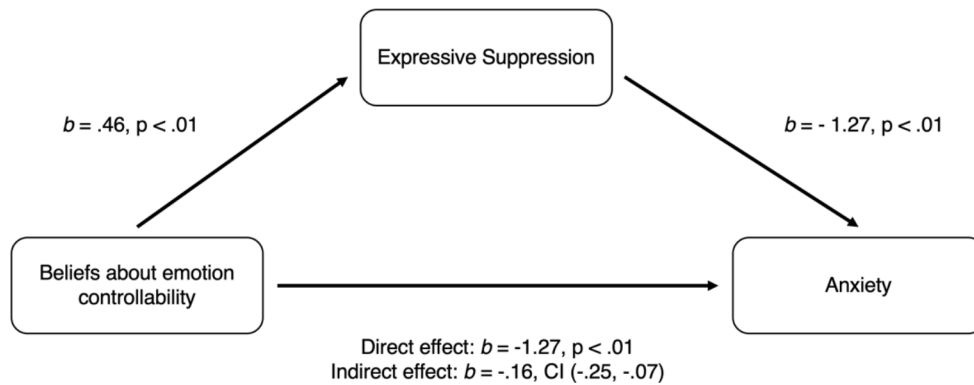
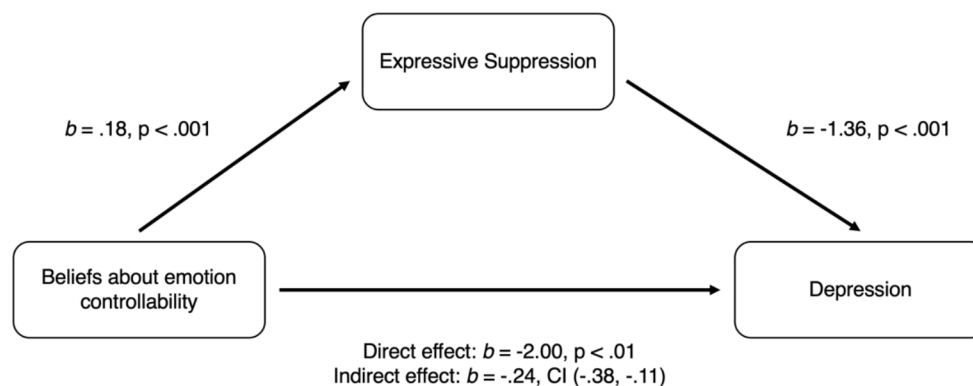


Fig. 3 The Indirect Effect of Beliefs about Emotion Controllability on Symptoms of Anxiety via Expressive Suppression. (Note: All path coefficients represent unstandardized regression weights. The indirect effect of emotion beliefs on anxiety via expressive suppression was significant (95% confidence interval))

95% CI = [-0.45, -0.17]); depression ($b = -0.59$, 95% CI = [-.77, -.43]), as predicted by Hypothesis 4. The indirect effect of emotion beliefs via expressive suppression

was also significant for both anxiety ($b = -0.16$, 95% CI = [-0.25, -0.07], see Fig. 3) and depression ($b = -0.24$, 95%

Fig. 4 The Indirect Effect of Beliefs about Emotion Controllability on Symptoms of Depression via Expressive suppression. (Note: All path coefficients represent unstandardized regression weights. The indirect effect of emotion beliefs on depression via expressive suppression was significant (95% confidence interval))



CI = [-0.38, -0.11], see Fig. 4), a result which was not consistent with Hypothesis 5.

Discussion

The current study found that individuals who believed emotions were relatively controllable experienced fewer symptoms of anxiety and depression. The analyses indicated that this association was partly explained by differences in people's use of emotion regulation strategies. The results support findings from previous studies linking emotion regulation strategy use with depression and anxiety (Gross & John, 2003; Aldao et al., 2010; De France & Hollenstein, 2017; Preece et al., 2021). Similarly, our results were consistent with previous research which found that emotion controllability beliefs are associated with reduced symptoms of depression (Manser et al., 2012; De Castella et al., 2013; Castella et al., 2018; Schroder et al., 2015, 2018). A new and notable finding in the present study was that the belief that one's own emotions are controllable was also associated with reduced symptoms of anxiety. This finding was consistent with our predictions and with conceptual models linking emotion controllability beliefs with a variety of outcomes associated with psychological health, via emotion regulation (Ford & Gross, 2018).

We also found that believing emotions are relatively controllable was associated with higher use of cognitive reappraisal. These findings support the idea that personal beliefs about emotions will impact a person's choice of emotion regulation strategy (Tamir et al., 2007). It seems that individuals who believe they are able to control their emotions engage in emotion regulation strategies which occur early in the emotion-generative process, such as cognitive reappraisal.

Unlike previous research, which has found that expressive suppression is not associated with beliefs about emotions (Gutentag et al., 2020; Kneeland et al., 2020; Tamir et al., 2007; Ford et al., 2018), the present study found that personal beliefs about emotion controllability was negatively

associated with expressive suppression. We expected there to be no association between these beliefs and suppression as we hypothesised that emotion controllability beliefs only relate to the *experience* of emotion and not the behavioural *expression* of emotion. However, our findings suggest beliefs may be associated with both the experience and expression of emotion. It is possible that because those who believe emotions are relatively uncontrollable rely less on proactive emotion regulation strategies, they have few options available to them other than to engage in response focused strategies, such as suppression, which occur late in the emotion generation process.

One possible explanation for the discrepancy between our results and those of previous studies is that the present study was conducted using a large international community sample whereas the participants in previous studies have been largely undergraduate students attending university in the United States (Tamir et al., 2007; Schroder et al., 2015) or adolescents (Ford et al., 2018). These differences in participant demographics may have led to differences in participants' use of expressive suppression as previous research has indicated that factors such as age and culture may shape how individuals regulate their emotions (Ford & Mauss, 2015; Zimmerman & Iwanski, 2014). However, it is also important to note that the effect size of this association was relatively small so further research is required to determine the reason behind these discrepancies.

Additionally, the present study found that both cognitive reappraisal and expressive suppression partially mediated the association between emotion beliefs and both anxiety and depression. This finding is notable because although previous research has found that cognitive reappraisal mediated the relationship between emotion beliefs and depression (De Castella et al., 2013), there has been a paucity of research examining cognitive reappraisal as a mediator in the relationship between emotion beliefs and anxiety. The present study's results are in line with the idea that cognitive reappraisal mediates the relationship between emotion beliefs and anxiety in a similar way to depression; that is, endorsement of the belief that one's own emotions are

controllable may lead to increased use of cognitive reappraisal because it occurs early in the emotion-generative sequence. This use of cognitive reappraisal may, in turn, have the beneficial effect of reducing symptoms of anxiety (Kneeland, Dovidio, et al., 2016).

In contrast to our predictions, we found that expressive suppression may also play a mediating role in the relationship between personal beliefs about emotions and psychological health. More specifically, believing that emotions are relatively uncontrollable was associated with more frequent use of expressive suppression which in turn mediated an increase in symptoms of anxiety and depression. This indirect pathway suggests that emotion controllability beliefs are also linked with strategies that target the expression of emotion. These strategies have been found to be less effective in downregulating negative emotion (Prece et al., 2021), and can even enhance negative emotion, due to the sole focus on reducing emotional expression at a late stage, once an emotional response has fully emerged (Gross, 2008). This is likely to explain the subsequent step in the pathway linking suppression with both anxiety and depression. As mentioned previously, our findings suggest this indirect route is relatively weak, particularly in relation to the link between emotion controllability beliefs and expression suppression. As there have also been mixed findings relating to these two variables in prior studies, more research examining this association is recommended.

Implications for practice

The findings of the present study may have important implications for future treatments and interventions for anxiety and depression. In Cognitive Behavioral Therapy (CBT), an evidence-based treatment for anxiety disorders and major depressive disorder, therapists teach clients how to reappraise emotions, unhelpful thought patterns and core beliefs (Beck, 1995). If emotion controllability beliefs influence emotion regulation strategy choice which in turn influences psychological health, then therapists could consider exploring individuals' beliefs about emotion controllability in order to determine if these beliefs are influencing strategy use and potentially maintaining symptoms of anxiety or low mood.

Limitations and future directions

Although the present study revealed important ways in which personal beliefs about emotion controllability, emotion regulation strategies and psychopathology are associated, it is not possible to establish causal links between these

variables due to the cross-sectional design of the study. Likewise, the effect sizes found in this study, although significant, were predominantly small, particularly in relation to expressive suppression. Additionally, the possibility of bidirectional relationships between the variables were not explored. For example, it is possible that beliefs about emotions may also reflect existing emotion regulation problems. Another possibility is that beliefs about emotions directly cause poor psychological health which in turn may impact on an individual's ability to use adaptive emotion regulation strategies. Thus, future research should include longitudinal designs that examine alternative pathways of association, such as bidirectionality.

Furthermore, this study used a non-clinical sample and thus the results cannot be generalized to people with clinical presentations of anxiety and depression. This point is particularly important when considering the association between anxiety, depression and emotion controllability beliefs, as previous research has suggested that psychologically healthy individuals are more likely to rate their own emotions as controllable than other people's emotions (De Castella et al., 2013; Castella et al., 2018) whereas individuals with clinical levels of anxiety and depression are more likely to see other people's emotions as more controllable than their own (De Castella et al., 2014). It is possible that for individuals with pathological levels of anxiety or depression, believing their own emotions are less controllable than others' may contribute to their clinical symptoms and maladaptive emotion regulation strategies. Therefore, future research should consider how emotion regulation mediates the association between emotion beliefs and psychopathology in clinical populations.

Despite these limitations, the current study provides an important contribution to research on the role emotion controllability beliefs play in the use of emotion regulation strategies and their association with anxiety and depression. In particular, we demonstrated that emotion regulation not only mediates the link between personal beliefs about emotion and depression but also anxiety. This study also raises the possibility that expressive suppression may, in fact, play a small role in the link between personal beliefs about emotions and psychological health.

These findings highlight the importance of emotion controllability beliefs in understanding why, whether, and when individuals engage in emotion regulation. By having a more nuanced perspective of these beliefs and how they relate to emotion regulation and psychological health, researchers and clinicians will be better able to identify optimal interventions for different individuals in the treatment of both anxiety and depression.

Authors' contributions All authors contributed to the study conception and design. Material preparation, data collection and analysis were

performed by Carla Deplancke, Matthew P. Somerville, Amy Harrison and Laura Vuillier. The first draft of the manuscript was written by Carla Deplancke and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Availability of data and material The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Code Availability Not applicable.

Declarations

Conflicts of interest/Competing interests The authors have no relevant financial or non-financial interests to disclose.

Ethics approval This study received ethical approval from the Research Ethics Panel at Bournemouth University and UCL Institute of Education. The authors certify that the study was performed in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments.

Consent to participate Informed consent was obtained from all individual participants included in the study.

Consent for publication Not applicable.

Additional declarations for articles in life science journals that report the results of studies involving humans and/or animals Not applicable.

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