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Research Paper

Cognitive Emotion Regulation, Rumination and State Anxiety: A Study Among Young Adults

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ABSTRACT

Cognitive emotion regulation (CER) is a critical aspect of how people regulate their emotions and state anxiety. This research considers the interplay among CER, rumination, and state anxiety, with four main goals: to investigate gender differences in using CER; to evaluate the association between rumination and state anxiety; to establish the predictive ability of rumination on state anxiety; and to consider the role of adaptive and maladaptive CER strategies on state anxiety levels. A cross-sectional design with 260 participants between the ages of 18 and 25 completed the Cognitive Emotion Regulation Questionnaire (CERQ), Perseverative Thinking Questionnaire (PTQ), and State-Trait Anxiety Inventory (STAI). The results indicated that females scored higher in rumination ($t(258) = -3.005$, $p = .003$) and refocus on planning ($t(258) = -2.207$, $p = .028$) compared to males. Rumination was positively correlated with state anxiety ($r = .576$, $p < .001$) and predicted it significantly, accounting for 33.1% of the variance ($R^2 = .331$, $F(1, 258) = 127.88$, $p < .001$). Of CER strategies, self-blame and catastrophizing were predictive of greater anxiety ($\beta = 4.273$, $\beta = 3.812$; $p < .001$), whereas positive reappraisal was predictive of less anxiety ($\beta = -7.368$, $p < .001$). Positive refocusing and planning, although negatively related, were not significant predictors. The results highlight the significance of CER in regulation of anxiety and inform culturally sensitive mental health interventions.

Keywords: *Cognitive Emotion Regulation, Rumination, State Anxiety, Gender Differences, Young Adults*

Cognitive emotion regulation (CER) is the intentional and conscious methods people employ to affect their emotional reactions. These methods involve cognitive reappraisal, suppression, and rumination (Garnefski & Kraaij, 2007). Unlike automatic emotional responses, CER entails active efforts to regulate emotions by either changing the way one perceives a situation or by controlling the ensuing behavioral and physiological response (Aldao et al., 2010). The efficacy of these strategies is an important aspect of mental health. Adaptive strategies like positive reappraisal are tied to emotional resilience and psychological well-being, while maladaptive strategies like catastrophizing and rumination are associated with emotional dysregulation, distress, and heightened vulnerability to psychopathology (Troy et al., 2018).

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CER strategies are typically classified as either adaptive or maladaptive (Gross, 2015). Adaptive approaches like problem-solving, cognitive reappraisal, and acceptance have been linked with improved coping skills, increased emotional regulation, and psychological flexibility (Webb, Miles, & Sheeran, 2012; Hayes, Strosahl, & Wilson, 2012). Conversely, maladaptive approaches like suppression, denial, and specifically rumination have been found to increase negative affect, strengthen unhealthy patterns of thinking, and contribute to increased emotional suffering (Nolen-Hoeksema et al., 2008; John & Gross, 2004). Gross's process model of emotion regulation distinguishes between antecedent-focused and response-focused strategies, depending on whether they precede or follow the full activation of an emotional response. Antecedent-focused strategies, such as reappraisal, have been shown to be more effective in mitigating distress.

Of the maladaptive strategies, rumination is perhaps the most researched. It consists of repetitive and passive concentration on one's suffering and its potential cause and aftermath, instead of engaging in efforts at resolution (Nolen-Hoeksema et al., 2008). Rumination has been shown to exacerbate negative mood, compromise problem-solving capacity, and pose risk for anxiety and depression (Watkins, 2008; Lyubomirsky & Nolen-Hoeksema, 1995). Neuroimaging research has established that rumination correlates with heightened amygdala and prefrontal cortex activation, which suggests a neurobiological explanation for its function in emotional dysregulation (Koster et al., 2011). Genetic influences of BDNF gene polymorphisms and environmental stressors, including early adversity, have also been linked to the tendency for rumination to persist (Clasen et al., 2011; Johnson et al., 2014). With its robust link to emotional distress, rumination is therefore typically a target of psychotherapeutic strategies like cognitive-behavioral therapy and mindfulness-based interventions (Topper et al., 2017).

Another central concept of emotional functioning is state anxiety, defined as a transitory affective state involving increased autonomic activation, fear, and apprehension in anticipation of threat (Spielberger, 1966). In contrast to trait anxiety, which is a stable tendency, state anxiety varies with situational demands (Endler & Kocovski, 2001). Although rural anxiety may be beneficial in short-term survival contexts, inordinate or chronic state anxiety will impair cognitive functioning, performance, and lead to the formation of anxiety disorders (Clark & Beck, 2010). Variables like personality characteristics such as neuroticism, and inflexible thinking styles, have been proven to be predictors of higher state anxiety (Lazarus & Folkman, 1984; Eysenck, 1992). Also, state anxiety has been associated with attention deficits, bad decision-making, and poor executive function (Bishop, 2007; McNaughton & Corr, 2004).

In the Indian context, anxiety-related problems are most common among young adults. A systematic review estimated that almost 29 percent of Indian adolescents experience anxiety disorders, and other surveys have shown that more than half of young adults have moderate to severe anxiety (Rajan et al., 2020). The COVID-19 pandemic has also added to these problems by generating increased uncertainty, academic disruption, and social isolation. Cultural forces such as high academic pressure, strong family expectations, and strict social norms also play a role in heightened levels of stress and the use of maladaptive coping like rumination (Bhat & Choudhury, 2018).

Notwithstanding these issues, very little empirical work has been done in India regarding the interrelationship between cognitive emotion regulation, rumination, and state anxiety in young people. These factors seem to interact in a bidirectional and self-sustaining feedback

loop. Rumination enhances anxiety, which in turn weakens cognitive control and makes it more difficult to disengage from ruminative cognition (Joormann & Stanton, 2016).

These links can be understood to inform the development of culturally sensitive interventions that promote adaptive regulation and decrease emotional suffering among young Indians.

***Hypotheses**:*

1. There is a significant gender difference in the use of cognitive emotion regulation strategies, with females engaging more in rumination
2. There is a significant positive correlation between rumination and state anxiety.
3. Rumination significantly predicts higher levels of state anxiety.
4. Maladaptive cognitive emotion regulation strategies will be positively associated with higher levels of state anxiety, whereas adaptive cognitive emotion regulation strategies will be negatively associated with state anxiety.

METHOD

Research Design

This research utilized a quantitative, cross-sectional, and correlational design to explore the associations between cognitive emotion regulation, rumination, and state anxiety in young adults. In addition, it investigated gender differences and predictive functions of cognitive emotion regulation strategies on state anxiety. A cross-sectional design permitted examination at a single point in time, whereas the correlational design permitted an exploration of the strength and direction of relationships.

Participants and Sampling

The population comprised 260 young adults (130 males, 130 females), aged between 18–25 years, which were selected via convenience sampling from universities and websites. Inclusion criteria necessitated English fluency and falling in the desired age group. Persons diagnosed with mental illnesses like anxiety disorders, depression, or bipolar disorder were excluded to minimize the confounding factors.

Measures

- **Cognitive Emotion Regulation Questionnaire (CERQ).** Garnefski et al. (2001) developed the CERQ, a 36-item self-report questionnaire that assesses nine cognitive strategies applied after aversive events—five adaptive and four maladaptive. Each item is scored on a 5-point Likert scale with higher scores reflecting more use. The CERQ shows adequate internal consistency ($\alpha = 0.68–0.89$) and test-retest reliability ($r = 0.57–0.81$).
- **Perseverative Thinking Questionnaire (PTQ)**. The PTQ (Ehring et al., 2011) is a 15-item self-report questionnaire assessing repetitive negative thinking. Items are scored on a 5-point scale from 0 ("never") to 4 ("almost always"). It measures three dimensions of RNT: repetitive/intrusive quality, difficulty in disengaging, and emotional effect. It has very good internal consistency ($\alpha = 0.94–0.95$) and test-retest reliability ($r = 0.74$).
- **State-Trait Anxiety Inventory – State Form (STAI-S).** The STAI-S (Spielberger et al., 1983) measures state anxiety at the moment of assessment with 20 items scored on a 4-point Likert scale. Scores can range from 20 to 80, with higher scores reflecting greater anxiety. It has high internal consistency ($\alpha = 0.86–0.95$), although

test-retest reliability is inconsistent (r = 0.16–0.62) because it is sensitive to changes in situations.

Procedure

After gaining ethical approval, participants were invited through university notice boards and the internet. They read the study details and signed informed consent. Data collection was via an online survey website. Participants initially completed a demographic questionnaire, then the CERQ, PTQ, and STAI-S in a set order. The approximate completion time was 15–20 minutes. Confidentiality was ensured by not collecting any identifying information. Incomplete responses were eliminated, and all data were stored in a secure, password-protected system.

Data Analysis

Data were analyzed through IBM SPSS Statistics Version 21. Descriptive statistics (means, standard deviations, frequencies) were calculated for demographic and study variables. An independent sample t-test compared gender differences in cognitive emotion regulation strategies. Pearson's correlations evaluated the relations between the three psychological variables. Multiple regression analysis was used to test the predictive function of maladaptive cognitive emotion regulation strategies for state anxiety. Statistical significance was established at $p < .05$.

RESULTS

Table 1 Independent Samples T-Test for Gender Differences in Cognitive Emotion Regulation Strategies

		Statistic	df	p
Acceptance	Student's t	-1.491	258	0.137
Positive Refocusing	Student's t	-1.637	258	0.103
Refocus on Planning	Student's t	-2.207[a]	258	0.028
Positive Reappraisal	Student's t	-1.463	258	0.145
Putting into Perspective	Student's t	0.108	258	0.914
Self Blame	Student's t	-1.104	258	0.270
Rumination	Student's t	-3.005	258	0.003
Catastrophizing	Student's t	-1.555	258	0.121
Blaming others	Student's t	1.729	258	0.085

Note. $H_a\ \mu 1 \neq \mu 2$

[a] *Levene's test is significant ($p < .05$), suggesting a violation of the assumption of equal variances*

An independent sample t-test revealed no significant gender differences in most cognitive emotion regulation strategies, including acceptance, positive refocusing, positive reappraisal, putting into perspective, self-blame, catastrophizing, and blaming others (all ps > .05). However, females scored significantly higher than males in refocus on planning, t(258) = -2.21, p = .028 (Welch's t-test used due to unequal variances), and in rumination, t(258) = -3.01, p = .003.

Table 2 Correlation between Rumination and State Anxiety

			Rumination	State Anxiety
Pearson's r	Rumination	Correlation Coefficient	1.000	.576**
		Sig. (2-tailed)	.	.000
		N	260	260
	State Anxiety	Correlation Coefficient	.576**	1.000
		Sig. (2-tailed)	.000	.
		N	260	260

***. Correlation is significant at the 0.01 level (2-tailed).*

A Pearson correlation analysis was conducted to examine the relationship between rumination and state anxiety. The results indicated a significant positive correlation, $r(260) = .576$, $p < .001$, suggesting that higher levels of rumination were associated with higher levels of state anxiety.

Table 3 Regression Analysis for Predicting State Anxiety from Rumination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics	
					R Square Change	F Change
1	.576[a]	.331	.329	10.2286	.331	127.883

A simple linear regression showed that rumination significantly predicted state anxiety, F = 127.88, p < .001, accounting for 33.1% of the variance ($R^2 = .331$). Rumination had a moderate to strong positive effect on state anxiety (β = 0.576, B = 0.802, SE = 0.071), with the relationship being statistically significant (p < .001).

Table 4 Correlation Between Maladaptive Cognitive Emotion Regulation Strategies and State Anxiety

		State Anxiety	Self Blame	Rumination	Catastrophizing	Blaming others
State Anxiety	Pearson Correlation	1	.289**	.168**	.336**	.197**
	Sig. (1-tailed)		.000	.003	.000	.001
	N	260	260	260	260	260
Self Blame	Pearson Correlation	.289**	1	.483**	.271**	.054
	Sig. (1-tailed)	.000		.000	.000	.191

	N	260	260	260	260	260
Rumination	Pearson Correlation	.168**	.483**	1	.338**	.205**
	Sig. (1-tailed)	.003	.000		.000	.000
	N	260	260	260	260	260
Catastrophizing	Pearson Correlation	.336**	.271**	.338**	1	.419**
	Sig. (1-tailed)	.000	.000	.000		.000
	N	260	260	260	260	260
Blaming Others	Pearson Correlation	.197**	.054	.205**	.419**	1
	Sig. (1-tailed)	.001	.191	.000	.000	
	N	260	260	260	260	260

**. Correlation is significant at the 0.01 level (1-tailed).

Pearson correlation analysis revealed significant positive relationships between state anxiety and maladaptive strategies: self-blame (r = .289), rumination (r = .168), catastrophizing (r = .336), and blaming others (r = .197), all p < .01. Catastrophizing showed the strongest link to anxiety. Additionally, self-blame was strongly correlated with rumination (r = .483) and catastrophizing (r = .271), while rumination also correlated with catastrophizing (r = .338) and blaming others (r = .205), highlighting the interrelated nature of these maladaptive patterns.

Table 5 Model Summary for Multiple Linear Regression Predicting State Anxiety

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2Change	F Change	df1	df2	Sig. F Change
1	.403[a]	.163	.150	11.5140	.163	12.383	4	255	.000

a. Predictors: (Constant), Blaming others, Self Blame, Catastrophizing, Rumination

Multiple linear regression showed that blaming others, self-blame, and catastrophizing significantly predicted state anxiety, F(4, 255) = 12.383, p < .001. The model explained 16.3% of the variance (R^2 = .163, Adjusted R^2 = .150), indicating these maladaptive strategies contribute meaningfully to anxiety. The standard error of the estimate was 11.51.

Table 6

		State Anxiety	Acceptance	Positive Refocusing	Refocus Planning	Positive Reappraisal	Putting into Perspective
State Anxiety	Pearson Correlation	1	.069	-.231**	-.156**	-.366**	-.029
	Sig. (1-tailed)		.133	.000	.006	.000	.322
	N	260	260	260	260	260	260
Acceptance	Pearson Correlation	.069	1	.292**	.326**	.200**	.319**
	Sig. (1-tailed)	.133		.000	.000	.001	.000
	N	260	260	260	260	260	260
Positive Refocusing	Pearson Correlation	-.231**	.292**	1	.432**	.548**	.401**
	Sig. (1-tailed)	.000	.000		.000	.000	.000
	N	260	260	260	260	260	260
Refocus Planning	Pearson Correlation	-.156**	.326**	.432**	1	.594**	.443**
	Sig. (1-tailed)	.006	.000	.000		.000	.000
	N	260	260	260	260	260	260
Positive Reappraisal	Pearson Correlation	-.366**	.200**	.548**	.594**	1	.490**
	Sig. (1-tailed)	.000	.001	.000	.000		.000
	N	260	260	260	260	260	260
Putting into Perspective	Pearson Correlation	-.029	.319**	.401**	.443**	.490**	1
	Sig. (1-tailed)	.322	.000	.000	.000	.000	
	N	260	260	260	260	260	260

**. Correlation is significant at the 0.01 level (1-tailed).

Pearson correlation showed that state anxiety was negatively correlated with positive refocusing ($r = -0.231$, $p < .001$), refocus on planning ($r = -0.156$, $p = .006$), and positive reappraisal ($r = -0.366$, $p < .001$), indicating lower anxiety with greater use of these strategies. Acceptance and putting into perspective showed no significant correlations.

Table 7 Model Summary for Multiple Linear Regression Predicting State Anxiety

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.377[a]	.142	.132	11.6312	.142	14.141	3	256	0.000

1. Predictors: (Constant), Positive Appraisal, Positive refocusing, Refocus on planning

Multiple linear regression revealed that positive appraisal, positive refocusing, and refocus on planning significantly predicted state anxiety, $F(3, 256) = 14.141$, $p < .001$. The model explained 14.2% of the variance ($R^2 = .142$, adjusted $R^2 = .132$), with a standard error of 11.63, indicating their role in anxiety regulation.

DISCUSSION

The first objective was to examine gender differences in cognitive emotion regulation strategies among young adults. Based on prior research, gender differences were expected. An independent sample t-test revealed significant differences in rumination, $t(258) = -3.005$, $p = .003$, with females scoring higher than males, aligning with findings by Nolen-Hoeksema (2012) and Rood et al. (2009). A significant difference also was found in refocus on planning, $t(258) = -2.207$, $p = .028$, suggesting women may use more organized and adaptive coping strategies, possibly to offset higher rumination (Tamres et al., 2002). No significant gender differences were found in self-blame, acceptance, positive refocusing, positive reappraisal, putting into perspective, catastrophizing, or blaming others.

Zlomke and Hahn (2010) discovered that rumination and catastrophizing occur more frequently in females than in males, proposing a socialization foundation. This is supported by gender socialization theory, which posits that emotional expression is shaped by society—girls are socialized to be relational and introspective, thus more likely to ruminate (Tamres et al., 2002), while boys are dissuaded from the expression of distress and tend to use avoidance mechanisms (Gross & John, 2003).

Neuroscientific research suggests that females reflect increased activity within areas of the brain that pertain to emotion processing, for instance, amygdala and anterior cingulate, possibly in addition to contributing to rumination enhancement (Goldstein et al., 2010; McRae et al., 2008). Hormonal variation, primarily of estrogen, increases emotional sensitivity and intolerance for disengaging from pessimistic thinking further (Comasco et al., 2014). Rumination predicts increased psychopathology within women (Aldao et al., 2010; Treynor et al., 2003).

Interestingly, gender differences also appear in the strategy of 'refocus on planning.' Although men are stereotypically viewed as being more solution-oriented (Tamres et al., 2002), women might use more planning-based coping to deal with distress. This could be due to sociocultural roles, especially in India, where women tend to be caregivers and problem-solvers (Gupta et al., 2020). Neurologically, planning has been linked to prefrontal cortex activity, reflecting cognitive control (McRae et al., 2008). While typically adaptive, excessive reliance on planning could become maladaptive in situations where stress is high (Nair & Banerjee, 2021). More studies should test its long-term efficacy across cultures.

The second objective of this research was to investigate the correlation between state anxiety and rumination. A moderate to high positive correlation ($r = 0.576$, $p < .001$) was established, as hypothesized, that increased rumination is associated with increased anxiety. This supports cognitive theories that propose rumination perpetuates distress by disrupting emotional regulation. Rumination is persistent, passive concentration on negative thoughts that delays emotional distress and doesn't alleviate it. Rumination was determined by Nolen-Hoeksema (1991) and McLaughlin & Nolen-Hoeksema (2011) as a cognitive risk factor for anxiety. According to Borkovec's Avoidance Theory (2004), rumination prevents emotional processing and perpetuates anxiety.

Neurobiological research is consistent with this connection: rumination in excess is linked to increased amygdala activity (Siegle et al., 2002), resulting in greater arousal and prolonged stress. Ruminators are also characterized by attentional bias towards threats (Koster et al., 2011) and are hence more susceptible to anxiety.

The greater-than-expected correlation could be a function of sample characteristics—e.g., academic stress—or cultural factors. Collectivist cultures tend to foster suppression of emotion, which may promote self-referent rumination and increase anxiety (Sahdra & Grossman, 2012). Although these results are consistent with current literature, they highlight the need for contextual variables—such as stress and cultural background—to mediate the influence of rumination on anxiety. Future research would do well to investigate the effects of such variables on this relationship in diverse populations.

The third objective sought to evaluate whether rumination can predict state anxiety. Regression analysis revealed that rumination was a significant predictor of state anxiety ($\beta = .576$, $p < .001$) and explained 33.1% of the variance using the regression analysis. This is in accordance with evidence that people who ruminate tend to have higher levels of anxiety as a result of perseverating in distress without engaging in problem-solving (McLaughlin & Nolen-Hoeksema, 2011; Mennin & Fresco, 2013). Cognitive theories account for this connection. Borkovec's (1994) Avoidance Model considers rumination a coping mechanism that avoids emotional processing, keeping one stuck in distress. Likewise, Watkins (2008) described how rumination tends to start with problem-solving motivation but ends in avoidance. Lazarus & Folkman's (1984) model proposes that people who perceive stress as unmanageable tend to ruminate, heightening anxiety.

Neuroscience confirms this too. Ruminators have higher amygdala activity and lower prefrontal-limbic connectivity, disrupting emotional control (Kaiser et al., 2015). Chronic rumination is also associated with HPA-axis dysregulation and increased cortisol, exacerbating physiological arousal and anxiety (Ottaviani et al., 2016). Rumination perpetuates anxiety by inhibiting adaptive coping mechanisms such as cognitive reappraisal. Response Styles Theory suggests that rumination, initiated by stress, locks people into negative thought patterns (Nolen-Hoeksema et al., 2008).

Culturally, in the Indian setting, social pressures and constrained emotional release, particularly for women—may enhance rumination and worry (Chadda & Deb, 2013; Gupta et al., 2020). Overall, rumination is a critical component in sustaining state anxiety. Therapies for rumination, including cognitive restructuring, mindfulness, and metacognitive therapy, may have applications to decrease anxiety. Future studies need to explore cultural and gender considerations to create more culturally specific treatments.

Lastly, this research also investigated the relationship between cognitive emotion regulation strategies and state anxiety, both maladaptive and adaptive strategies. Results indicated that maladaptive strategies—particularly catastrophizing and self-blame—were highly related to increased state anxiety levels. Catastrophizing, which is the overestimation of bad things happening, had the strongest correlation and is associated with amygdala hyperactivation, amplifying fear reactions. Self-blame also played a significant role, frequently being linked to negative core beliefs and HPA axis dysregulation, exacerbating emotional distress. Rumination, although not a specific predictor, was also positively related to anxiety, linked to prefrontal cortex impairment and hyperactivation of the default mode network, which prevents cognitive disengagement from negative thinking. Externalizing blame, although correlated, was not a predictor but could still indirectly contribute to anxiety through social conflict and emotional rigidity.

By contrast, adaptive strategies such as positive reappraisal, refocusing on planning, and positive refocusing were negatively correlated with state anxiety. Positive reappraisal was the strongest negative predictor, encouraging cognitive restructuring and activating prefrontal areas to control threat responses. Positive refocusing and planning, while not unique predictors, were found to have potential in reducing anxiety by increasing control, optimism, and executive function. Future research needs to investigate these strategies over time and probe cultural and neurological aspects to maximize therapeutic use.

CONCLUSION

This study examined the links between cognitive emotion regulation (CER), rumination, and state anxiety in young adults, focusing on gender differences and predictive roles of rumination and CER strategies. Findings showed that females scored higher in rumination and refocus on planning, consistent with past research suggesting sociocultural and biological influences on emotional coping styles. A moderate to strong positive correlation between rumination and state anxiety was found, with rumination predicting 33.1% of the variance in state anxiety levels.

Maladaptive CER strategies—self-blame, catastrophizing, rumination, and blaming others—were positively linked to higher anxiety, with catastrophizing and self-blame explaining 16.3% of the variance. In contrast, adaptive strategies like positive refocusing, positive reappraisal, and refocus planning showed negative correlations with anxiety. Among these, positive reappraisal significantly predicted lower anxiety, accounting for 14.2% of the variance.

Overall, the results underscore CER's role in anxiety and suggest a need for culturally sensitive interventions. Future research should explore how individual and cultural differences moderate these relationships.

Limitations of the Study

Although the study provides important insights, several limitations should be mentioned:

- **Self-report Bias:** This study has relied on self-reported measures which are prone to social desirability and recall biases. Thus, participants may have either under- or over-reported their use of emotion regulation strategies.
- **Cross-Sectional Design:** This study employed a cross-sectional design which limits drawing conclusions about causality. Longitudinal studies are needed to examine how gender differences in emotion regulation evolve over time.

- **Cultural Specificity:** The findings are limited to an Indian sample, and thus the generalizability of these findings for other cultures may be hampered. Cross-cultural studies could shed light on the possibility of universality of such gender differences.
- **Limited Focus on Non-Binary Individuals:** The study definitively compared only among two genders; it did not include the aspect of emotion regulatory processes going on in the non-binary or gender-diverse individuals. Hence, it is suggested that future research should adopt this inclusive approach towards gender identity.
- **Variability in Strategy Measurement:** Rumination was a significant predictor of state anxiety when analyzed separately but lost significance when examined within cognitive emotion regulation strategies. This discrepancy may result from the limited number of questions assessing rumination, which could also affect the predictive strength of other strategies.

Future Implications

Following on the existing research, subsequent research is required to assess the creation and testing of gender-sensitive cognitive-behavioral interventions designed to decrease maladaptive processes like rumination. There is a requirement for longitudinal assessments to measure whether and how changes in gender patterns of emotion regulation occur across development and impact on mental health outcome. Cross-cultural comparisons would provide evidence to suggest whether or not the existing patterns of gender within emotion regulation generalize across cultures. Notably, future research should involve non-binary and LGBTQ+ populations as well as to provide a more inclusive and comprehensive picture of how emotion regulation strategies work across various gender identities.

REFERENCES

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2009). Emotion-regulation strategies across psychopathology: A meta-analytic review. *Clinical Psychology Review*, *30*(2), 217–237. https://doi.org/10.1016/j.cpr.2009.11.004

APA PsycNet. (n.d.-a). https://psycnet.apa.org/record/2009-03669-003 *APA PsycNet*. (n.d.-b). https://psycnet.apa.org/record/2007-12103-002 *APA PsycNet*. (n.d.-c). https://psycnet.apa.org/record/2016-06085-000

Arbor, A. (2003, June 1). *Rumination reconsidered: A psychometric analysis*. https://deepblue.lib.umich.edu/handle/2027.42/44342

Archer, R. P. (1979). Relationships between locus of control, trait anxiety, and state anxiety: An interactionist perspective1. *Journal of Personality*, *47*(2), 305–316. https://doi.org/10.1111/j.1467-6494.1979.tb00204.x

Aslan, I. H., Dorey, L., Grant, J. E., & Chamberlain, S. R. (2024). Emotion regulation across psychiatric disorders. *CNS Spectrums*, *29*(3), 215–220. https://doi.org/10.1017/s1092852924000270

Baek, J., & Nierenberg, A. A. (2014). Reply. *Acta Psychiatrica Scandinavica*, *130*(1), 73. https://doi.org/10.1111/acps.12267

Bao, C., & Han, L. (2025). Gender difference in anxiety and related factors among adolescents. *Frontiers in Public Health*, *12*. https://doi.org/10.3389/fpubh.2024.1410086

Barlow, D. H., Ellard, K. K., Sauer-Zavala, S., Bullis, J. R., & Carl, J. R. (2014). The origins of neuroticism. *Perspectives on Psychological Science*, *9*(5), 481–496. https://doi.org/10.1177/1745691614544528

Barnes, L. L. B., Harp, D., & Jung, W. S. (2002). Reliability Generalization of scores on the Spielberger State-Trait anxiety inventory. *Educational and Psychological Measurement*, *62*(4), 603–618. https://doi.org/10.1177/0013164402062004005

Bean, C. A., Heggeness, L. F., & Ciesla, J. A. (2021). Ruminative inertia, emotion regulation, and Depression: a Daily-Diary study. *Behavior Therapy*, *52*(6), 1477–1488. https://doi.org/10.1016/j.beth.2021.04.004

Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2014). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of Affective Disorders*, *173*, 90–96. https://doi.org/10.1016/j.jad.2014.10.054

Berking, M., & Whitley, B. (2014). Affect regulation training. In *Springer eBooks*. https://doi.org/10.1007/978-1-4939-1022-9

Bettis, A. H., Henry, L., Prussien, K. V., Vreeland, A., Smith, M., Adery, L. H., & Compas,

B. E. (2018). Laboratory and Self-Report Methods to assess reappraisal and distraction in youth. *Journal of Clinical Child & Adolescent Psychology*, *48*(6), 855–865. https://doi.org/10.1080/15374416.2018.1466306

Boger, L. L. (1956). Discussion: Research Methods in Price Analysis. *Journal of Farm Economics*, *38*(5), 1441. https://doi.org/10.2307/1234567

Brehl, A., Schene, A., Kohn, N., & Fernández, G. (2021). Maladaptive emotion regulation strategies in a vulnerable population predict increased anxiety during the Covid-19 pandemic: A pseudo-prospective study. *Journal of Affective Disorders Reports*, *4*, 100113. https://doi.org/10.1016/j.jadr.2021.100113

Brosschot, J. F., Gerin, W., & Thayer, J. F. (2006). The perseverative cognition hypothesis: A review of worry, prolonged stress-related physiological activation, and health. *Journal of Psychosomatic Research*, *60*(2), 113–124. https://doi.org/10.1016/j.jpsychores.2005.06.074

Bystritsky, A., Khalsa, S. S., Cameron, M. E., & Schiffman, J. (2013, January 1). *Current diagnosis and treatment of anxiety disorders*. https://pmc.ncbi.nlm.nih.gov/articles/PMC3628173/

Carver, C. S., Johnson, S. L., & Joormann, J. (2008). Serotonergic function, two-mode models of self-regulation, and vulnerability to depression: What depression has in common with impulsive aggression. *Psychological Bulletin*, *134*(6), 912–943. https://doi.org/10.1037/a0013740

Cécillon, F., Mermillod, M., Leys, C., Lachaux, J., Vigouroux, S. L., & Shankland, R. (2024). Trait Anxiety, Emotion Regulation, and Metacognitive Beliefs: An Observational Study Incorporating Separate Network and Correlation Analyses to Examine Associations with Executive Functions and Academic Achievement. *Children*, *11*(1), 123. https://doi.org/10.3390/children11010123

Chadda, R., & Deb, K. (2013). Indian family systems, collectivistic society and psychotherapy. *Indian Journal of Psychiatry*, *55*(6), 299. https://doi.org/10.4103/0019-5545.105555

Chand, S. P., & Marwaha, R. (2023, April 24). *Anxiety*. StatPearls - NCBI Bookshelf. https://www.ncbi.nlm.nih.gov/books/NBK470361/

Chaplin, T. M. (2014). Gender and Emotion Expression: A Developmental Contextual perspective. *Emotion Review*, *7*(1), 14–21. https://doi.org/10.1177/1754073914544408

Chen, E., Lewin, M. R., & Craske, M. G. (1996). Effects of state anxiety on selective processing of threatening information. *Cognition & Emotion*, *10*(3), 225–240. https://doi.org/10.1080/026999396380231

Choi, J. M., Padmala, S., & Pessoa, L. (2011). Impact of state anxiety on the interaction between threat monitoring and cognition. *NeuroImage*, *59*(2), 1912–1923. https://doi.org/10.1016/j.neuroimage.2011.08.102

Chorpita, B. F., & Barlow, D. H. (1998). The development of anxiety: the role of control in the early environment. *Psychological Bulletin*, *124*(1), 3–21. https://doi.org/10.1037/0033-2909.124.1.3

Clark, D. A., & Beck, A. T. (2010). *Cognitive therapy of anxiety disorders* [Book]. The Guilford Press.

https://www.terapia-cognitiva.mx/pdf_files/2Semestre/teoria-y-tratamiento-transtornos-an si edad/recursos/%5BDavid_A._Clark_Phd,Aaron_T._Beck_MD%5D_Cognitive_T(Book Fi.org).pdf

Cohen, E., Zerach, G., & Solomon, Z. (2011). The implication of combat-induced stress reaction, PTSD, and attachment in parenting among war veterans. *Journal of Family Psychology*, *25*(5), 688–698. https://doi.org/10.1037/a0024065

Compas, B. E., Jaser, S. S., Bettis, A. H., Watson, K. H., Gruhn, M. A., Dunbar, J. P., Williams, E., & Thigpen, J. C. (2017). Coping, emotion regulation, and psychopathology in childhood and adolescence: A meta-analysis and narrative review. *Psychological Bulletin*, *143*(9), 939–991. https://doi.org/10.1037/bul0000110

Craske, M. G., & Stein, M. B. (2016). Anxiety. *The Lancet*, *388*(10063), 3048–3059. https://doi.org/10.1016/s0140-6736(16)30381-6

Critchfield, K. L., Levy, K. N., Clarkin, J. F., & Kernberg, O. F. (2007). The relational context of aggression in borderline personality disorder: using adult attachment style to predict forms of hostility. *Journal of Clinical Psychology*, *64*(1), 67–82. https://doi.org/10.1002/jclp.20434

Davidson, R. J. (2002). Anxiety and affective style: role of prefrontal cortex and amygdala. *Biological Psychiatry*, *51*(1), 68–80. https://doi.org/10.1016/s0006-3223(01)01328-2

Domaradzka, E., & Fajkowska, M. (2018). Cognitive emotion regulation strategies in anxiety and depression understood as types of personality. *Frontiers in Psychology*, *9*. https://doi.org/10.3389/fpsyg.2018.00856

Emotion regulation: a theme in search of definition. (1994). PubMed. https://pubmed.ncbi.nlm.nih.gov/7984164/

Endler, N. S., & Kocovski, N. L. (2001). State and trait anxiety revisited. *Journal of Anxiety Disorders*, *15*(3), 231–245. https://doi.org/10.1016/s0887-6185(01)00060-3

Endler, N. S., Parker, J. D., Bagby, R. M., & Cox, B. J. (1991). Multidimensionality of state and trait anxiety: Factor structure of the Endler Multidimensional Anxiety Scales. *Journal of Personality and Social Psychology*, *60*(6), 919–926. https://doi.org/10.1037/0022-3514.60.6.919

Etkin, A., & Wager, T. D. (2007). Functional Neuroimaging of Anxiety: A Meta-Analysis of Emotional Processing in PTSD, social anxiety disorder, and Specific Phobia. *American Journal of Psychiatry*, *164*(10), 1476–1488. https://doi.org/10.1176/appi.ajp.2007.07030504

Folkman, S. (2013). Stress: appraisal and coping. In *Springer eBooks* (pp. 1913–1915). https://doi.org/10.1007/978-1-4419-1005-9_215

Folkman, S., & Moskowitz, J. T. (2004). Coping: pitfalls and promise. *Annual Review of Psychology*, *55*(1), 745–774. https://doi.org/10.1146/annurev.psych.55.090902.141456

Ford, B. Q., Lam, P., John, O. P., & Mauss, I. B. (2017a). The psychological health benefits of accepting negative emotions and thoughts: Laboratory, diary, and longitudinal evidence. *Journal of Personality and Social Psychology*, *115*(6), 1075–1092. https://doi.org/10.1037/pspp0000157

Ford, B. Q., Lam, P., John, O. P., & Mauss, I. B. (2017b). The psychological health benefits of accepting negative emotions and thoughts: Laboratory, diary, and longitudinal evidence. *Journal of Personality and Social Psychology*, *115*(6), 1075–1092. https://doi.org/10.1037/pspp0000157

Ford, B. Q., & Mauss, I. B. (2015). Culture and emotion regulation. *Current Opinion in Psychology*, *3*, 1–5. https://doi.org/10.1016/j.copsyc.2014.12.004

Foroudifard, F., Amini, P., Navid, B., Omani-Samani, R., Sepidarkish, M., & Maroufizadeh, S. (2020). Cognitive emotion regulation, anxiety, and depression in infertile women: a cross-sectional study. *Middle East Fertility Society Journal*, *25*(1). https://doi.org/10.1186/s43043-020-00035-2

Fox, K. R., Huang, X., Linthicum, K. P., Wang, S. B., Franklin, J. C., & Ribeiro, J. D. (2019). Model complexity improves the prediction of nonsuicidal self-injury. *Journal of Consulting and Clinical Psychology*, *87*(8), 684–692. https://doi.org/10.1037/ccp0000421

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, *56*(3), 218–226. https://doi.org/10.1037/0003-066x.56.3.218

Garnefski, N., & Kraaij, V. (2007). The Cognitive Emotion Regulation Questionnaire. *European Journal of Psychological Assessment*, *23*(3), 141–149. https://doi.org/10.1027/1015-5759.23.3.141

Garnefski, N., Kraaij, V., & Spinhoven, P. (2001). Negative life events, cognitive emotion regulation and emotional problems. *Personality and Individual Differences*, *30*(8), 1311–1327. https://doi.org/10.1016/s0191-8869(00)00113-6

Goldstein, J. M., Jerram, M., Poldrack, R., Ahern, T., Kennedy, D. N., Seidman, L. J., & Makris, N. (2005). Hormonal cycle modulates arousal circuitry in women using functional magnetic resonance imaging. *Journal of Neuroscience*, *25*(40), 9309–9316. https://doi.org/10.1523/jneurosci.2239-05.2005

Gorman, I., Belser, A. B., Jerome, L., Hennigan, C., Shechet, B., Hamilton, S., Yazar-Klosinski, B., Emerson, A., & Feduccia, A. A. (2020). Posttraumatic growth after MDMA-Assisted psychotherapy for posttraumatic stress Disorder. *Journal of Traumatic Stress*, *33*(2), 161–170. https://doi.org/10.1002/jts.22479

Gross, J. J. (1998). The Emerging Field of Emotion Regulation: An Integrative Review. *Review of General Psychology*, *2*(3), 271–299. https://doi.org/10.1037/1089-2680.2.3.271

Gross, J. J. (2015). Emotion Regulation: Current status and future Prospects. *Psychological Inquiry*, *26*(1), 1–26. https://doi.org/10.1080/1047840x.2014.940781

Gross, J. J., & John, O. P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*, *85*(2), 348–362. https://doi.org/10.1037/0022-3514.85.2.348

Grover, S., Sahoo, S., Mehra, A., Avasthi, A., Tripathi, A., Subramanyan, A., Pattojoshi, A., Rao, G., Saha, G., Mishra, K., Chakraborty, K., Rao, N., Vaishnav, M., Singh, O., Dalal, P., Chadda, R., Gupta, R., Gautam, S., Sarkar, S., . . . Reddy, Y. J. (2020). Psychological impact of COVID-19 lockdown: An online survey from India. *Indian Journal of Psychiatry*, *62*(4), 354. https://doi.org/10.4103/psychiatry.indianjpsychiatry_427_20

Gu, J., Strauss, C., Bond, R., & Cavanagh, K. (2015). How do mindfulness-based cognitive therapy and mindfulness-based stress reduction improve mental health and wellbeing? A systematic review and meta-analysis of mediation studies. *Clinical Psychology Review*, *37*, 1–12. https://doi.org/10.1016/j.cpr.2015.01.006

Gudjonsson, G. H. (1988). Interrogative suggestibility: Its relationship with assertiveness, social-evaluative anxiety, state anxiety and method of coping. *British Journal of Clinical Psychology*, *27*(2), 159–166. https://doi.org/10.1111/j.2044-8260.1988.tb00764.x

Halberstadt, J. (2006). The generality and ultimate origins of the attractiveness of prototypes. *Personality and Social Psychology Review*, *10*(2), 166–183. https://doi.org/10.1207/s15327957pspr1002_5

Hamilton, J. P., Farmer, M., Fogelman, P., & Gotlib, I. H. (2015). Depressive rumination, the Default-Mode Network, and the dark matter of clinical neuroscience. *Biological Psychiatry*, *78*(4), 224–230. https://doi.org/10.1016/j.biopsych.2015.02.020

Hammermeister, J., & Burton, D. (2001). Stress, Appraisal, and Coping Revisited: Examining the Antecedents of Competitive State Anxiety with Endurance Athletes. *The Sport Psychologist*, *15*(1), 66–90. https://doi.org/10.1123/tsp.15.1.66

Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2012). *Acceptance and Commitment Therapy: The process and practice of Mindful change* [Book]. The Guilford Press. http://students.aiu.edu/submissions/profiles/resources/onlineBook/N8Z3q9_1609189620.pdf

Hettema, J. M., Neale, M. C., & Kendler, K. S. (2001a). A Review and Meta-Analysis of the Genetic Epidemiology of Anxiety Disorders. *American Journal of Psychiatry*, *158*(10), 1568–1578. https://doi.org/10.1176/appi.ajp.158.10.1568

Hettema, J. M., Neale, M. C., & Kendler, K. S. (2001b). A Review and Meta-Analysis of the Genetic Epidemiology of Anxiety Disorders. *American Journal of Psychiatry*, *158*(10), 1568–1578. https://doi.org/10.1176/appi.ajp.158.10.1568

Hofmann, S. G. (2004). Perception of control over anxiety mediates the relation between catastrophic thinking and social anxiety in social phobia. *Behaviour Research and Therapy*, *43*(7), 885–895. https://doi.org/10.1016/j.brat.2004.07.002

Hofmann, S. G. (2007). Cognitive Factors that Maintain Social Anxiety Disorder: a Comprehensive Model and its Treatment Implications. *Cognitive Behaviour Therapy*, *36*(4), 193–209. https://doi.org/10.1080/16506070701421313

Ilagan, G. S., & Choi-Kain, L. W. (2020). General psychiatric management for adolescents (GPM-A) with borderline personality disorder. *Current Opinion in Psychology*, *37*, 1–6. https://doi.org/10.1016/j.copsyc.2020.05.006

Indovina, I., Robbins, T. W., Núñez-Elizalde, A. O., Dunn, B. D., & Bishop, S. J. (2011). Fear-Conditioning Mechanisms Associated with Trait Vulnerability to Anxiety in Humans. *Neuron*, *69*(3), 563–571. https://doi.org/10.1016/j.neuron.2010.12.034

Int-Veen, I., Volz, M., Kroczek, A., Fallgatter, A. J., Ehlis, A., Rubel, J. A., & Rosenbaum, D. (2024). Emotion regulation use in daily-life and its association with success of emotion-regulation, self-efficacy, stress, and state rumination. *Frontiers in Psychology*, *15*. https://doi.org/10.3389/fpsyg.2024.1400223

Jermann, F., Van Der Linden, M., D'Acremont, M., & Zermatten, A. (2006). Cognitive Emotion Regulation Questionnaire (CERQ). *European Journal of Psychological Assessment*, *22*(2), 126–131. https://doi.org/10.1027/1015-5759.22.2.126

John, O. P., & Gross, J. J. (2004). Healthy and unhealthy emotion regulation: personality processes, individual differences, and life span development. *Journal of Personality*, *72*(6), 1301–1334. https://doi.org/10.1111/j.1467-6494.2004.00298.x

Johnson, D. P., & Whisman, M. A. (2013). Gender differences in rumination: A meta-analysis. *Personality and Individual Differences*, *55*(4), 367–374. https://doi.org/10.1016/j.paid.2013.03.019

Johnson, D. P., Whisman, M. A., Corley, R. P., Hewitt, J. K., & Friedman, N. P. (2014). Genetic and environmental influences on rumination and its covariation with depression. *Cognition & Emotion*, *28*(7), 1270–1286. https://doi.org/10.1080/02699931.2014.881325

Johnson, S. L., Murray, G., Fredrickson, B., Youngstrom, E. A., Hinshaw, S., Bass, J. M., Deckersbach, T., Schooler, J., & Salloum, I. (2011). Creativity and bipolar disorder: Touched by fire or burning with questions? *Clinical Psychology Review*, *32*(1), 1–12. https://doi.org/10.1016/j.cpr.2011.10.001

Joormann, J., & Gotlib, I. H. (2009). Emotion regulation in depression: Relation to cognitive inhibition. *Cognition & Emotion*, *24*(2), 281–298. https://doi.org/10.1080/02699930903407948

Joormann, J., & Stanton, C. H. (2016). Examining emotion regulation in depression: A review and future directions. *Behaviour Research and Therapy*, *86*, 35–49. https://doi.org/10.1016/j.brat.2016.07.007

Julian, L. J. (2011). Measures of anxiety: State-Trait Anxiety Inventory (STAI), Beck Anxiety Inventory (BAI), and Hospital Anxiety and Depression Scale-Anxiety (HADS-A). *Arthritis Care & Research*, *63*(S11). https://doi.org/10.1002/acr.20561

Kanske, P., Heissler, J., Schönfelder, S., & Wessa, M. (2012). Neural correlates of emotion regulation deficits in remitted depression: The influence of regulation strategy, habitual regulation use, and emotional valence. *NeuroImage*, *61*(3), 686–693. https://doi.org/10.1016/j.neuroimage.2012.03.089

Karteroliotis, C., & Gill, D. L. (1987). Temporal changes in psychological and physiological components of state anxiety. *Journal of Sport Psychology*, *9*(3), 261–274. https://doi.org/10.1123/jsp.9.3.261

Kendall, P. C. (1981). Anxiety: States, Traits—Situations? In *Elsevier eBooks* (pp. 208–220). https://doi.org/10.1016/b978-0-08-023719-0.50025-5

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). Lifetime Prevalence and Age-of-Onset Distributions of DSM-IV Disorders in the National Comorbidity Survey Replication. *Archives of General Psychiatry*, *62*(6), 593. https://doi.org/10.1001/archpsyc.62.6.593

Koster, E. H., De Lissnyder, E., Derakshan, N., & De Raedt, R. (2010). Understanding depressive rumination from a cognitive science perspective: The impaired disengagement hypothesis. *Clinical Psychology Review*, *31*(1), 138–145. https://doi.org/10.1016/j.cpr.2010.08.005

Kotov, R., Gamez, W., Schmidt, F., & Watson, D. (2010). Linking "big" personality traits to anxiety, depressive, and substance use disorders: A meta-analysis. *Psychological Bulletin*, *136*(5), 768–821. https://doi.org/10.1037/a0020327

Kovács, L. N., Kocsel, N., Tóth, Z., Smahajcsik-Szabó, T., Karsai, S., & Kökönyei, G. (2025). The daily relations of co-rumination and perseverative cognition. *Scientific Reports*, *15*(1). https://doi.org/10.1038/s41598-025-87335-7

Kraiss, J. T., Klooster, P. M. T., Moskowitz, J. T., & Bohlmeijer, E. T. (2020). The relationship between emotion regulation and well-being in patients with mental disorders: A meta-analysis. *Comprehensive Psychiatry*, *102*, 152189. https://doi.org/10.1016/j.comppsych.2020.152189

Kroenke, K., Spitzer, R. L., Williams, J. B., Monahan, P. O., & Löwe, B. (2007). Anxiety Disorders in Primary Care: Prevalence, impairment, comorbidity, and detection. *Annals of Internal Medicine*, *146*(5), 317. https://doi.org/10.7326/0003-4819-146-5-200703060-00004

Kuehner, C. (2016). Why is depression more common among women than among men? *The Lancet Psychiatry*, *4*(2), 146–158. https://doi.org/10.1016/s2215-0366(16)30263-2

Kumar, R., Kumar, K., Benegal, V., Roopesh, B., & Ravi, G. (2020). Integrated intervention program for alcoholism improves impulsiveness and disadvantageous reward processing/risk-taking. *Indian Journal of Psychiatry*, *62*(4), 384. https://doi.org/10.4103/psychiatry.indianjpsychiatry_103_20

Kumar, S. G., Kattimani, S., Sarkar, S., & Kar, S. S. (2017). Prevalence of depression and its relation to stress level among medical students in Puducherry, India. *Industrial Psychiatry Journal*, *26*(1), 86. https://doi.org/10.4103/ipj.ipj_45_15

Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist*, *64*(4), 241–256. https://doi.org/10.1037/a0015309

Laicher, H., Int-Veen, I., Torka, F., Kroczek, A., Bihlmaier, I., Storchak, H., Velten-Schurian, K., Dresler, T., Täglich, R., Fallgatter, A. J., Ehlis, A., & Rosenbaum, D. (2022). Trait rumination and social anxiety separately influence stress-induced rumination and hemodynamic responses. *Scientific Reports*, *12*(1). https://doi.org/10.1038/s41598-022-08579-1

LeDoux, J. E. (1996). The Emotional Brain the Mysterious Underpinnings of Emotional life. New York Simon and Schuster. - References - Scientific Research Publishing. (n.d.). https://www.scirp.org/reference/referencespapers?referenceid=1331726

Loskot, T. (2019). Interpersonal Emotion Regulation: strategies, behaviors, and goals. *Berkeley Undergraduate Journal*, *33*(2). https://doi.org/10.5070/b3332046934

Lyubomirsky, S., & Nolen-Hoeksema, S. (1995). Effects of self-focused rumination on negative thinking and interpersonal problem solving. *Journal of Personality and Social Psychology*, *69*(1), 176–190. https://doi.org/10.1037/0022-3514.69.1.176

Makovac, E., Meeten, F., Watson, D. R., Herman, A., Garfinkel, S. N., Critchley, H. D., & Ottaviani, C. (2015). Alterations in Amygdala-Prefrontal functional connectivity account for excessive worry and autonomic dysregulation in generalized anxiety disorder. *Biological Psychiatry*, *80*(10), 786–795. https://doi.org/10.1016/j.biopsych.2015.10.013

Malouff, J. M., Schutte, N. S., & McClelland, T. (1992). Examination of the relationship between irrational beliefs and state anxiety. *Personality and Individual Differences*, *13*(4), 451–456. https://doi.org/10.1016/0191-8869(92)90074-y

Martin, E. I., Ressler, K. J., Binder, E., & Nemeroff, C. B. (2009). The Neurobiology of Anxiety Disorders: brain imaging, genetics, and Psychoneuroendocrinology. *Psychiatric Clinics of North America*, *32*(3), 549–575. https://doi.org/10.1016/j.psc.2009.05.004

Martin, R. C., & Dahlen, E. R. (2005). Cognitive emotion regulation in the prediction of depression, anxiety, stress, and anger. *Personality and Individual Differences*, *39*(7), 1249–1260. https://doi.org/10.1016/j.paid.2005.06.004

Mathews, A., & MacLeod, C. (2004). Cognitive vulnerability to emotional disorders. *Annual Review of Clinical Psychology*, *1*(1), 167–195. https://doi.org/10.1146/annurev.clinpsy.1.102803.143916

Mathews, B. L., Koehn, A. J., Abtahi, M. M., & Kerns, K. A. (2016). Emotional Competence and Anxiety in Childhood and Adolescence: A Meta-Analytic Review. *Clinical Child and Family Psychology Review*, *19*(2), 162–184. https://doi.org/10.1007/s10567-016-0204-3

McEvoy, P. M., Mahoney, A. E., & Moulds, M. L. (2010). Are worry, rumination, and post-event processing one and the same? *Journal of Anxiety Disorders*, *24*(5), 509–519. https://doi.org/10.1016/j.janxdis.2010.03.008

McEwen, B. S. (2007). Physiology and neurobiology of stress and adaptation: central role of the brain. *Physiological Reviews*, *87*(3), 873–904. https://doi.org/10.1152/physrev.00041.2006

McLaughlin, K. A., & Nolen-Hoeksema, S. (2010). Rumination as a transdiagnostic factor in depression and anxiety. *Behaviour Research and Therapy*, *49*(3), 186–193. https://doi.org/10.1016/j.brat.2010.12.006

McRae, K., Ochsner, K. N., Mauss, I. B., Gabrieli, J. J. D., & Gross, J. J. (2008). Gender Differences in Emotion Regulation: An FMRI Study of Cognitive Reappraisal. *Group Processes & Intergroup Relations*, *11*(2), 143–162. https://doi.org/10.1177/1368430207088035

Michl, L. C., McLaughlin, K. A., Shepherd, K., & Nolen-Hoeksema, S. (2013). Rumination as a mechanism linking stressful life events to symptoms of depression and anxiety: Longitudinal evidence in early adolescents and adults. *Journal of Abnormal Psychology*, *122*(2), 339–352. https://doi.org/10.1037/a0031994

Mineka, S., & Zinbarg, R. (2006). A contemporary learning theory perspective on the etiology of anxiety disorders: It's not what you thought it was. *American Psychologist*, *61*(1), 10–26. https://doi.org/10.1037/0003-066x.61.1.10

Murphy, K., Harris, A. D., & Wise, R. G. (2010). Robustly measuring vascular reactivity differences with breath-hold: Normalising stimulus-evoked and resting state BOLD fMRI data. *NeuroImage*, *54*(1), 369–379. https://doi.org/10.1016/j.neuroimage.2010.07.059

Naragon-Gainey, K., McMahon, T. P., & Chacko, T. P. (2017). The structure of common emotion regulation strategies: A meta-analytic examination. *Psychological Bulletin*, *143*(4), 384–427. https://doi.org/10.1037/bul0000093

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology*, *100*(4), 569–582. https://doi.org/10.1037/0021-843x.100.4.569

Nolen-Hoeksema, S. (2000). The role of rumination in depressive disorders and mixed anxiety/depressive symptoms. *Journal of Abnormal Psychology*, *109*(3), 504–511. https://doi.org/10.1037/0021-843x.109.3.504

Nolen-Hoeksema, S., Wisco, B. E., & Lyubomirsky, S. (2008). Rethinking rumination. *Perspectives on Psychological Science*, *3*(5), 400–424. https://doi.org/10.1111/j.1745-6924.2008.00088.x

Noordam, R., Gunn, D. A., Tomlin, C. C., Rozing, M. P., Maier, A. B., Slagboom, P. E., Westendorp, R. G., Van Heemst, D., & De Craen, A. J. (2012). Cortisol serum levels in familial longevity and perceived age: The Leiden Longevity Study. *Psychoneuroendocrinology*, *37*(10), 1669–1675. https://doi.org/10.1016/j.psyneuen.2012.02.013

Ochsner, K., & Gross, J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences*, *9*(5), 242–249. https://doi.org/10.1016/j.tics.2005.03.010

Paulzen, M., Goecke, T. W., Stickeler, E., Gründer, G., & Schoretsanitis, G. (2017). Sertraline in pregnancy – Therapeutic drug monitoring in maternal blood, amniotic fluid and cord blood. *Journal of Affective Disorders*, *212*, 1–6. https://doi.org/10.1016/j.jad.2017.01.019

Porges, S. W. (2006). The polyvagal perspective. *Biological Psychology*, *74*(2), 116–143. https://doi.org/10.1016/j.biopsycho.2006.06.009

Prapavessis, H., Grove, J. R., McNair, P. J., & Cable, N. T. (1992). Self-Regulation Training, state Anxiety, and sport Performance: A Psychophysiological case study. *The Sport Psychologist*, *6*(3), 213–229. https://doi.org/10.1123/tsp.6.3.213

Rabeyron, T., & Watt, C. (2009). Paranormal experiences, mental health and mental boundaries, and psi. *Personality and Individual Differences*, *48*(4), 487–492. https://doi.org/10.1016/j.paid.2009.11.029

Rao, N. M. S. A., & M, N. D. K. (2017). Emotional Intelligence and Gender Differences: A Study among the Youth in Bangalore City, India. *International Journal of Indian Psychology*, *4*(4). https://doi.org/10.25215/0404.023

Roelofs, J., Huibers, M., Peeters, F., Arntz, A., & Van Os, J. (2008). Rumination and worrying as possible mediators in the relation between neuroticism and symptoms of depression and anxiety in clinically depressed individuals. *Behaviour Research and Therapy*, *46*(12), 1283–1289. https://doi.org/10.1016/j.brat.2008.10.002

Sahoo, S., & Khess, C. R. J. (2010a). Prevalence of depression, anxiety, and stress among young male adults in India. *The Journal of Nervous and Mental Disease*, *198*(12), 901–904. https://doi.org/10.1097/nmd.0b013e3181fe75dc

Sahoo, S., & Khess, C. R. J. (2010b). Prevalence of depression, anxiety, and stress among young male adults in India. *The Journal of Nervous and Mental Disease*, *198*(12), 901–904. https://doi.org/10.1097/nmd.0b013e3181fe75dc

Saviola, F., Pappaianni, E., Monti, A., Grecucci, A., Jovicich, J., & De Pisapia, N. (2020). Trait and state anxiety are mapped differently in the human brain. *Scientific Reports*, *10*(1). https://doi.org/10.1038/s41598-020-68008-z

Shin, L. M., & Liberzon, I. (2009). The neurocircuitry of fear, stress, and anxiety disorders. *Neuropsychopharmacology*, *35*(1), 169–191. https://doi.org/10.1038/npp.2009.83

Sikora, M., Verzak, Z., Matijevic, M., Vcev, A., Siber, S., Music, L., & Carek, A. (2018). Anxiety And Depression Scores in Patients with Burning Mouth Syndrome. *Psychiatria Danubina*, *30*(4), 466–470. https://doi.org/10.24869/psyd.2018.466

Slavich, G. M., & Irwin, M. R. (2014). From stress to inflammation and major depressive disorder: A social signal transduction theory of depression. *Psychological Bulletin*, *140*(3), 774–815. https://doi.org/10.1037/a0035302

Smoller, J. W. (2015). The Genetics of Stress-Related Disorders: PTSD, depression, and Anxiety Disorders. *Neuropsychopharmacology*, *41*(1), 297–319. https://doi.org/10.1038/npp.2015.266

Søren Kierkegaard (Stanford Encyclopedia of Philosophy). (2023, May 22). https://plato .stanford.edu/entries/kierkegaard/

Spada, M. M., Georgiou, G. A., & Wells, A. (2009). The Relationship among Metacognitions, Attentional Control, and State Anxiety. *Cognitive Behaviour Therapy*, *39*(1), 64–71. https://doi.org/10.1080/16506070902991791

Spasojević, J., & Alloy, L. B. (2001). Rumination as a common mechanism relating depressive risk factors to depression. *Emotion*, *1*(1), 25–37. https://doi.org/10.1037/1528-3 542.1.1.25

Spielberger, C. D., Gorsuch, R. L., Lushene, R. E., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the State-Trait Anxiety Inventory (STAI).* Consulting Psychologists Press.

Spielberger, C. D. (1983). *Manual for the State-Trait Anxiety Inventory (STAI)*. Consulting Psychologists Press.

Spielberger, C.D. (1966) Theory and Research in Anxiety. Academic Press, New York, 3-20. - References - Scientific Research Publishing. (n.d.). https://www.scirp.org/reference/re ferencespapers?referenceid=3747485

Stein, M. B., & Stein, D. J. (2008). Social anxiety disorder. *The Lancet*, *371*(9618), 1115–1125. https://doi.org/10.1016/s0140-6736(08)60488-2

Stress, social support, and the buffering hypothesis. (1985, September 1). PubMed. https://pubmed.ncbi.nlm.nih.gov/3901065/

Tandon, R. (2020). Asian Journal of Psychiatry—Beginning a new decade. *Asian Journal of Psychiatry*, *47*, 101924. https://doi.org/10.1016/j.ajp.2020.101924

Tangney, J. P., Stuewig, J., & Mashek, D. J. (2006). Moral emotions and moral behavior. *Annual Review of Psychology*, *58*(1), 345–372. https://doi.org/10.1146/annurev.psych.56 .091103.070145

There was an error loading the content. (2015). *www.jstor.org*. https://www.jstor.org/stable/j.ct vc77hvc

Thibaut, F., & Jhanwar, V. (2020). Gender differences: The new challenge for the next years. *Indian Journal of Psychiatry*, *62*(2), 112. https://doi.org/10.4103/psychiatry.indianjpsy chiatry_75_20

Thomaes, S., Bushman, B. J., De Castro, B. O., & Stegge, H. (2009). What makes narcissists bloom? A framework for research on the etiology and development of narcissism. *Development and Psychopathology*, *21*(4), 1233–1247. https://doi.org/10.1017/s0954 579409990137

Topper, M., Emmelkamp, P. M., Watkins, E., & Ehring, T. (2016). Prevention of anxiety disorders and depression by targeting excessive worry and rumination in adolescents and young adults: A randomized controlled trial. *Behaviour Research and Therapy*, *90*, 123–136. https://doi.org/10.1016/j.brat.2016.12.015

Tovilovic, S., Novovic, Z., Mihic, L., & Jovanovic, V. (2009). The role of trait anxiety in induction of state anxiety. *Psihologija*, *42*(4), 491–504. https://doi.org/10.2298/psi0904 491t

Treynor, W. (2003). Rumination reconsidered: A psychometric analysis. *Cognitive Therapy and Research*, *27*(3), 247–259. https://doi.org/10.1023/a:1023910315561

Troy, A. S., Shallcross, A. J., & Mauss, I. B. (2013). A Person-by-Situation approach to emotion Regulation. *Psychological Science*, *24*(12), 2505–2514. https://doi.org/10.1177/095 6797613496434

Troy, A. S., Wilhelm, F. H., Shallcross, A. J., & Mauss, I. B. (2010). Seeing the silver lining: Cognitive reappraisal ability moderates the relationship between stress and depressive symptoms. *Emotion*, *10*(6), 783–795. https://doi.org/10.1037/a0020262

Ursache, A., & Raver, C. C. (2013). Trait and state anxiety: Relations to executive functioning in an at-risk sample. *Cognition & Emotion*, *28*(5), 845–855. https://doi.org/10 .1080/02699931.2013.855173

Ursu, A., & Măirean, C. (2022). Cognitive Emotion Regulation Strategies as Mediators between Resilience and Stress during COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, *19*(19), 12631. https://doi.org/10.3390/ijerph191912631

Vanderhasselt, M., De Raedt, R., Baeken, C., Leyman, L., & D'haenen, H. (2006). The influence of rTMS over the left dorsolateral prefrontal cortex on Stroop task performance. *Experimental Brain Research*, *169*(2), 279–282. https://doi.org/10.1007/s00221-005-0344-z

Verghese, A. (2008). Spirituality and mental health. *Indian Journal of Psychiatry*, *50*(4), 233. https://doi.org/10.4103/0019-5545.44742

Vigneau, F., & Cormier, S. (2008). The factor Structure of the State-Trait Anxiety Inventory: An Alternative View. *Journal of Personality Assessment*, *90*(3), 280–285. https://doi.org/10.1080/00223890701885027

Wagnon, J. L., Mahaffey, C. L., Sun, W., Yang, Y., Chao, H., & Frankel, W. N. (2011). Etiology of a genetically complex seizure disorder in Celf4 mutant mice. *Genes Brain & Behavior*, *10*(7), 765–777. https://doi.org/10.1111/j.1601-183x.2011.00717.x

Watkins, E. (2004). Adaptive and maladaptive ruminative self-focus during emotional processing. *Behaviour Research and Therapy*, *42*(9), 1037–1052. https://doi.org/10.1016/j.brat.2004.01.009

Watkins, E. R. (2008a). Constructive and unconstructive repetitive thought. *Psychological Bulletin*, *134*(2), 163–206. https://doi.org/10.1037/0033-2909.134.2.163

Watkins, E. R. (2008b). Constructive and unconstructive repetitive thought. *Psychological Bulletin*, *134*(2), 163–206. https://doi.org/10.1037/0033-2909.134.2.163

Watkins, E. R. (2009). Depressive Rumination and Co-Morbidity: Evidence for Brooding as a Transdiagnostic process. *Journal of Rational-Emotive & Cognitive-Behavior Therapy*, *27*(3), 160–175. https://doi.org/10.1007/s10942-009-0098-9

Webb, T. L., Miles, E., & Sheeran, P. (2012). Dealing with feeling: A meta-analysis of the effectiveness of strategies derived from the process model of emotion regulation. *Psychological Bulletin*, *138*(4), 775–808. https://doi.org/10.1037/a0027600

Wells, A. (2009) Metacognitive Therapy for Anxiety and Depression. Guilford Press, New York, 316 p. - References - Scientific Research Publishing. (n.d.). https://www.scirp.org/reference/referencespapers?referenceid=1515276

Whitmer, A. J., & Gotlib, I. H. (2012). An attentional scope model of rumination. *Psychological Bulletin*, *139*(5), 1036–1061. https://doi.org/10.1037/a0030923

Widiger, T. A., & Oltmanns, J. R. (2017). Neuroticism is a fundamental domain of personality with enormous public health implications. *World Psychiatry*, *16*(2), 144–145. https://doi.org/10.1002/wps.20411

Williams, J. M. G., Mathews, A., & MacLeod, C. (1996). The emotional Stroop task and psychopathology. *Psychological Bulletin*, *120*(1), 3–24. https://doi.org/10.1037/0033-2909.120.1.3

Williams, J. M., & Krane, V. (1992). Coping styles and self-reported measures of state anxiety and self-confidence. *Journal of Applied Sport Psychology*, *4*(2), 134–143. https://doi.org/10.1080/10413209208406457

Yao, Y., Chen, J., & Xuan, Y. (2023). The relationship between anxiety and cognitive emotion regulation strategies: A meta-analysis. *Applied Cognitive Psychology*, *37*(6), 1366–1383. https://doi.org/10.1002/acp.4129

Zareian, B., Wilson, J., & LeMoult, J. (2021). Cognitive control and ruminative responses to stress: Understanding the different facets of cognitive control. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.660062

Zeidner, M. (1998). Test anxiety the state of the Art. New York Plenum. - References - Scientific Research Publishing. (n.d.). https://www.scirp.org/reference/referencespapers?referenceid=845527

Zhang, D., Liu, S., Wu, X., & Tian, Y. (2022). Network analysis of cognitive emotion regulation strategies and depressive symptoms in young adults after recent stressful events: The moderation of childhood maltreatment. *Journal of Affective Disorders*, *301*, 107–116. https://doi.org/10.1016/j.jad.2022.01.044

Zuzama, N., Fiol-Veny, A., Roman-Juan, J., & Balle, M. (2020). Emotion Regulation Style and Daily Rumination: Potential Mediators between Affect and Both Depression and Anxiety during Adolescence. *International Journal of Environmental Research and Public Health*, *17*(18), 6614. https://doi.org/10.3390/ijerph17186614

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Conflict of Interest

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