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Cognitive Reappraisal is Associated with Lower Dysphoria Symptoms During the COVID-19 Pandemic

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ABSTRACT

The COVID-19 pandemic has created unprecedented mental health concerns generally, but particularly for young adults navigating an already fluctuating and uncertain period of their lives. While there are many factors related to mental health, it is well-documented that emotion regulation– the ability to modulate an emotion or set of emotions– and risk perception appear to be relevant to the development, maintenance, and treatment of psychopathology. The current study aimed to assess the relationship between emotion regulation processes, COVID-19 risk perception, and dysphoria symptoms during the early months of the pandemic. Between April - May 2020, 243 undergraduate participants completed the Emotion Regulation Questionnaire, the dysphoria subscale of the IDAS-II, and questions about their perceived risk of COVID-19. Two subfacets of emotion regulation known as cognitive reappraisal and expressive suppression were analyzed specifically. Results indicated, contrary to hypotheses, no significant interaction between cognitive reappraisal and risk perception on dysphoria, nor was there a significant interaction between expressive suppression and risk perception on dysphoria. However, there were significant main effects of cognitive reappraisal on dysphoria and expressive suppression on dysphoria indicating cognitive reappraisal may be a more beneficial emotion strategy for maintaining mental health.

1. INTRODUCTION

On March 11, 2020, the World Health Organization (WHO) officially declared the novel coronavirus disease (COVID-19) a global pandemic (CDC, 2022). With the pandemic came not only the possibility of life-threatening disease, but also stress, uncertainty, and social isolation, resulting in a growing global mental health crisis. Focus on mental health has steadily grown in recent decades, as research has indicated a growing decline in the mental health of children and young adults. The 2019 United States Youth Risk Behavior Survey reported a 61.7% increase in the suicide rates of adolescents from the years 2009 to 2018 (Ivey-Stephenson et al., 2020). Unfortunately, the pandemic only exacerbated such mental health issues.

A. Mental Health and COVID-19

Recent studies have shown the negative psychological effects of COVID-19, with adult populations self-reporting lower overall psychological well-being as a result of the pandemic (Sønderskov et al., 2020). A study investigating the mental health of 2,031 college students in the United States furthered this sentiment. In the sample that was collected in May 2020 – approximately 2 months after the official declaration of the pandemic – about 48% of the students reported moderate-to-severe levels of depression, and 18% reported thoughts of suicide (Wang et al., 2020). Furthermore, 71% of the students indicated that their stress and anxiety levels had increased as a result of the pandemic, and less than half reported feeling capable of properly coping with the stress brought on by the pandemic (Wang et al., 2020). Beyond university samples, the impact of the pandemic on mental health was also seen in adult populations across the world. A study done in the United Kingdom demonstrated that around 29% of adults without depression or anxiety one year prior to the pandemic, later reported the development of these disorders by the height of the pandemic in April of 2020 (Chandola et al., 2020).

B. Emotion Regulation

In response to the general population's increasing stress and growing mental health issues, questions on strategies related to alleviating such symptoms arose. There are generally four categories of coping mechanisms: problem-focused, meaning-focused, social coping, and emotion-focused (see Algorani & Gupta, 2023 for more detail). Emotion-focused coping mechanisms, which aim to reduce the negative emotions associated with a problem (Algorani & Gupta, 2023) may be particularly helpful during the prolonged uncertainty and social isolation that occurred during the pandemic. Emotion regulation is defined as the ability of an individual to modulate an emotion, set of emotions, or emotional experience (APA Dictionary of Psychology, 2014) in order to function adaptively. It is a set of processes that can be engaged to dictate how and when

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emotions are expressed and experienced (Gross, 1998; Eisenberg, Hofer & Vaughn, 2007; for a review see Compas et al., 2014).

A number of different emotion regulation processes have been identified, but the goal is usually to downregulate negative (and sometimes positive) emotions. Two common emotion regulation processes are cognitive reappraisal and expressive suppression. Cognitive reappraisal is a strategy where the goal is to interpret or cognitively restructure a potentially emotionally arousing event or situation in order to alter and dampen the impact of the emotion (John & Gross, 2004; Gross & Thompson, 2007). This cognitive process is put in place early during the emotional experience and is an "antecedent-focused strategy" (Ioannidis & Sieglin, 2015) that is generally considered to be a beneficial approach, often leading to better social and psychological functioning (Cutuli, 2014). Expressive suppression is a strategy where the goal is to inhibit, hide, or reduce emotionally expressive behavior like facial expressions (Cutuli, 2014; Gross & Levenson, 1993). This behavioral strategy is employed later in the emotional experience, and is considered "response-focused" after the emotional response has already occurred (Ioannidis & Siegling, 2015), and is considered a maladaptive approach to emotion regulation when compared to cognitive reappraisal.

Gross and John (2003) demonstrated the benefits of using cognitive reappraisal in their five-part study. They found that individuals who employed cognitive reappraisal more often had greater expression of positive emotions and less expression of negative emotions, whereas individuals who employed expressive suppression more often expressed less positive emotion and greater negative emotion. Their findings also suggested that cognitive reappraisal leads to improved interpersonal functioning, fewer depressive symptoms, and better overall psychological well-being in comparison to expressive suppression (Gross & John, 2003). A study done by Eftekhari et al. (2009) further supports the relationship between emotion regulation and psychopathology. Participants in this study were administered the emotion regulation questionnaire (ERQ), a self-report measure designed to assess how an individual utilizes cognitive reappraisal and expressive suppression. Individuals identified as frequently using cognitive reappraisal, but less expressive suppression, were noted to report significantly lower levels of depression, anxiety and PTSD in comparison to those identified as low frequency users of emotion regulation techniques. Additionally, individuals who reported having a moderate-to-low use of emotion regulation in general were consistently shown to have the highest levels of depression, anxiety, and PTSD (Eftekhari et al., 2009). These results again suggest a negative correlation between cognitive reappraisal and the development of psychopathology.

C. Risk Perception

In addition to emotion regulation abilities and strategies, risk perception may have also played a role in the development of psychopathology during the COVID-19 pandemic. A study conducted by Olagoke et al. (2020) assessed the relationship between exposure to COVID-19 news, risk perception, and depressive symptoms. They found a significant positive correlation between news exposure and perceived severity of COVID-19, as well as news exposure and perceived vulnerability of COVID-19. Additionally, they identified a positive correlation between COVID-19 news exposure and depressive symptoms when controlling for socioeconomic status. Interestingly, perceived vulnerability to COVID-19 was determined to partially mediate the relationship between COVID-19 news exposure and depressive symptoms (Olagoke et al., 2020). These findings were further supported by Kim et al. (2020) who found that higher risk perception of COVID-19 was associated with higher levels of depressive symptoms, and that those who suffered from childhood trauma exhibited even greater depressive symptoms due to heightened COVID-19 risk perception (Kim et al., 2020). Both of these studies provide some initial support that risk perception may be a significant factor in the development of depressive symptoms as it relates to COVID-19.

D. Current Study

The empirical findings detailed above lead to the current research question regarding whether emotion regulation and COVID-19 risk perception were related to mental health outcomes during the COVID-19 pandemic. We focus on dysphoria, which is a mental state of general distress and is predictive of major depressive disorder and generalized anxiety disorder. Specifically, we hypothesized that increased use of the emotion regulation strategy cognitive reappraisal over expressive suppression (assessed with the ERQ) would be associated with lower dysphoria symptoms, (assessed with the IDAS-II Dysphoria subscale). However, this association would be dependent on COVID-19 risk perceptions, specifically that dysphoria symptoms would worsen for those with increased risk perception of COVID-19.

2. METHODS

A. Participants

The study was approved by the Southern Methodist University institutional review board, and all participants provided informed consent. A total of 243 participants were recruited from the SONA psychology participant pool and were compensated with partial course credit. Of the 243 participants, 231 were included in the current analyses (12 were excluded for not providing data on our measures of interest). Of the 231 participants, 70.1% were female and 29.9% were male, 6.9% identified as African American, 10.4% as Asian/Pacific Islander, 77.1% as White, and 5.2% identified as "Other." Additionally, 8.7% identified as Hispanic, 89.6% as Not Hispanic, and 1.3% preferred not to identify their ethnicity. The age of participants (n = 197; 34 failed to report age) ranged between 18 and 29 with a mean of 19.73 (SD = 1.56).

B. Materials

Data, including demographics, and all questionnaires were obtained online via Qualtrics. The current study is a secondary analysis from a large survey dataset that contained many other questionnaires, but we

Predictor	B	SE B	b	t	p	95% CI
(Constant)	2.190	0.103				
Cognitive Reappraisal	-0.150	0.055	-0.179	-2.745	**0.007**	[-0.258, -0.042]
Risk Perception	0.093	0.064	0.095	1.44	0.15	[-0.34, 0.219]
Gender	-0.013	0.123	-0.007	-0.106	0.915	[-0.256, 0.230]
Cognitive Reappraisal*Risk Perception	0.091	0.065	0.092	1.409	0.160	[-0.36, 0.218]

Table 1: Interaction Between Cognitive Reappraisal and Risk Perception on Dysphoria

described only the three analyzed for our specific research questions.

C. Emotion Regulation Questionnaire (ERQ)

The ERQ is a 10-item scale used to assess the way respondents regulate their emotions through either cognitive reappraisal or expressive suppression (Garnefski & Kraaij, 2007). Each item is rated on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Items 1, 3, 5, 7, 8, and 10 make up the cognitive reappraisal facet, and items 2, 4, 6, and 9 make up the expressive suppression facet. The ERQ cognitive reappraisal subscale consisted of six items (a = .847) and the expressive suppression subscale consisted of 4 items (a = .827).

D. Inventory of Depression and Anxiety Symptoms II (IDAS-II)

The IDAS-II (Watson et al., 2012) is a self-report questionnaire used to assess a range of symptoms from 18 non-overlapping subscales assessing specific symptoms of depression and anxiety, as well as bipolar disorder. The inventory is modular, so these 18 scales can be administered and assessed separately. Each of the 99 items is rated on a 5-point Likert scale ranging from 1 (not at all) to 5 (extremely). In the current study, we administered the 10-item Dysphoria subscale which assesses core emotional and cognitive symptoms of depression and anxiety (e.g., low mood, anhedonia, cognitive problems), and is a good marker of general distress and negative affect, as well as low positive mood (Watson et al., 2012). Given that depression and anxiety often share overlapping symptoms, the Dysphoria subscale was selected to examine these components from a transdiagnostic, bottom-up approach. Additionally, this subscale has demonstrated high predictive validity for internalizing psychopathology, as well as good convergent validity with other measures of depression and anxiety (r = .69-.81; Weitzner et al., 2019). In the current study, a mean score was calculated for each participant (Cronbach's a = .898).

E. COVID-19 Risk Perception

Four questions were created to assess risk perception of COVID-19 (Cronbach's a = .72) and each was rated on a Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). A mean score was calculated for each participant. The questions included were:

1. At some point in the next 12 months, I am likely to get COVID-19 if I do not practice good hygiene and social distancing.
2. If I do not practice good hygiene and social distancing, I would feel very vulnerable to getting COVID-19 within the next 12 months.
3. I worry about becoming infected with COVID-19 at some point in the next 12 months.
4. If I became infected with COVID-19, it would be very serious.

F. Procedure

Consent and data collection all took place online via a survey on Qualtrics. After providing informed consent, participants were given details on what the experiment would entail and provided demographic information. This was followed by a series of questionnaires (e.g., health behaviors, memory, mood, personality), and instructions for each were displayed at the top of the screen. The entire online survey took about 1 hour to complete. The order of the three questionnaires utilized in the current study was: COVID risk-perception, ERQ, and then IDAS-II.

G. Data Analysis

To test the effects of different emotion regulation strategies on dysphoria symptoms, mean cognitive reappraisal and mean expressive suppression scores from the ERQ were calculated for each participant. Cognitive reappraisal and expressive suppression scores were entered into separate multiple linear regression analyses with mean dysphoria symptoms calculated for the IDAS-II, as the dependent variable. Mean values were entered instead of total sum scores due to some missing data, and total sum scores would have likely underestimated participant scores. Mean risk perception, calculated from the COVID-19 risk perception scale was included as a moderator in the model due to previous literature and our hypotheses of a possible interaction between risk perception and emotion regulation type on dysphoria symptoms. Gender was added as a covariate in the regression models to account for an unequal number of male and female participants.

3. RESULTS

Two scores from the ERQ were calculated for each participant, the expressive suppression score M = 3.54 (SD

Predictor	B	SE B	b	t	p	95% CI
(Constant)	2.151	0.107				
Expressive Suppression	0.093	0.045	0.143	2.073	**0.039**	[0.005, 0.181]
Risk Perception	0.098	0.065	0.101	1.501	0.135	[-0.031, 0.227]
Gender	0.043	0.129	0.023	0.334	0.739	[-0.212, 0.298]
Expressive Suppression*Risk Perception	-0.043	0.048	-0.060	-0.888	0.376	[-0.138, 0.52]

Table 2: Interaction Between Expressive Suppression and Risk Perception on Dysphoria

Variable	n	M	SD	1	2	3	4
1. Cognitive Reappraisal	230	4.72	1.03	—			
2. Expressive Suppression	230	3.54	1.33	0.043	—		
3. Risk Perception	231	3.56	0.88	0.033	-0.046	—	
4. Dysphoria Mean	231	2.19	0.87	-0.176**	0.123	0.081	—

Table 3: Descriptive Statistics and Correlations for Study Variables. *Note:* $^{**}p < .01$

= 1.33) and cognitive reappraisal score $M = 4.72$ ($SD = 1.03$). Examining the IDAS-II, the mean dysphoria score was calculated for each participant, $M = 2.19$ ($SD = 0.87$). The mean COVID-19 risk perception score was calculated from those 4 items, $M = 3.56$ ($SD = 0.88$).

To answer our research question of whether higher cognitive reappraisal was associated with lower dysphoria symptoms, we ran a linear regression with COVID risk perception included as a moderator in the model with gender as a covariate. There was no significant interaction between cognitive reappraisal and risk perception on dysphoria symptoms, $b = 0.09$, $t(225) = 1.41$, $p = 0.16$ (see Table 1). Additionally, there was no significant interaction between expressive suppression and risk perception on dysphoria symptoms $b = -0.04$, $t(225) = -0.89$, $p = .38$ (see Table 2). However, there were significant main effects of cognitive reappraisal on dysphoria and expressive suppression on dysphoria, respectively. For every 1 unit increase in mean cognitive reappraisal, there was a 0.15 unit decrease in mean dysphoria, $b = -0.15$, $t(225) = -2.75$, $p = 0.007$. These results were controlling for gender and were at average levels of risk perception. Furthermore, for every 1 unit increase in mean expressive suppression, there was a 0.093 unit increase in mean dysphoria, $b = 0.093$, $t(225) = 2.07$, $p = 0.039$. While there was no significant effect of risk perception as a moderator, cognitive reappraisal and expressive suppression separately show main effects on dysphoria symptoms.

A correlation matrix was also run to assess how the variables cognitive reappraisal, expressive suppression, risk perception, and dysphoria were related. There was a significant, but weak, negative correlation between cognitive reappraisal and dysphoria, $r = -0.176$, $p < .01$ (see Table 3).

4. DISCUSSION

The aim of this study was to assess the relationship between emotion regulation and risk perception as it pertained to mental health outcomes during the COVID-19 pandemic. Specifically, we predicted that the emotion regulation subfacet, cognitive reappraisal, would be associated with lower dysphoria symptoms, contingent on heightened levels of COVID-19 risk perception. An additional exploratory regression analysis was run to assess the relationship between emotion regulation subfacet expressive suppression and risk perception on dysphoria symptoms. In contrast to hypotheses, no significant interactions were found between either emotion regulation type and risk perception on dysphoria symptom scores. Therefore, there seemed to be no significant effect of risk perception as a moderator on this relationship. COVID-19 risk perception was included as a moderator on account of previous literature suggesting potential interactive effects on depressive symptoms. Studies reviewed in the introduction (Olagoke et al., 2020; Kim et al., 2020) examining the role of risk perception, also included variables about COVID-19 news exposure and perceived severity of COVID-19. Perhaps the way we assessed risk perception–4 statements created as a measure for this experiment– was not capturing the construct as we intended, or in the same way as prior work. Alternatively, the assessment of media exposure may also be important in calculating risk perception or including as a moderator. Media can play a significant role in how people respond during COVID-19, particularly their level of dysphoria (Gower et al., 2023). Media consumption may be an important variable to include in future studies.

Despite no interaction, there were significant main effects for both mean cognitive reappraisal and mean expressive suppression independently on mean dysphoria

symptoms. We found that as mean cognitive reappraisal scores increased there was a significant *decrease* in mean dysphoria symptoms, a finding that was also supported by a significant negative correlation between these variables. As mean expressive suppression scores increased, there was an increase in mean dysphoria symptoms. This indicates that cognitive reappraisal and expressive suppression have opposing influences on dysphoria, in line with prior work. Studies reviewed in the introduction have also found that higher levels of cognitive reappraisal use may be beneficial for mental health outcomes compared to expressive suppression (Gross & John, 2003), specifically, lower levels of depression, anxiety, and PTSD (Eftekhari et al., 2009).

While the main effects are in line with prior literature, they should be interpreted along with several limitations. Our sample was relatively small and homogeneous consisting of exclusively Southern Methodist University undergraduate students who were mostly white and female. Gender was the only covariate included in the model to account for the disproportionate number of female participants. Age was not included as a covariate due to 34 missing data points, which would have reduced our sample to $N = 197$, but age is also very restricted in range in this undergraduate sample. Race was also excluded as a covariate for similar reasons as age, in addition to potentially taking up too many degrees of freedom, but could be a significant predictor of mental health, particularly during COVID-19 (Gower et al., 2023), which could be examined in future studies. The constraints of our sample limit our ability to generalize these null findings to the larger population, thus increasing the sample size and capturing a more diverse sample is crucial for future research.

Furthermore, the inclusion of multiple clinical populations, rather than or in addition to an undergraduate sample, would increase variability of dysphoria symptoms. Dysphoria is a mental state of general distress and is predictive of major depressive disorder and generalized anxiety disorder, so it is not specific to one condition or disorder. Thus, expanding to other clinical populations may provide compelling findings by increasing variability in dysphoria symptom severity. The level of symptom severity in the current sample was relatively low. Longitudinal investigations will also be necessary to better capture the true nature of these transient variables. Assessing changes to dysphoria symptoms, the potential development of depression and/or anxiety, and how emotion regulation contributes to mental health outcomes over time are important future directions. Finally, in this study, we employed the ERQ to measure emotion regulation, specifically cognitive reappraisal and expressive suppression, but there are other measures that may better assess emotion regulation. The Emotion Dysregulation Inventory (EDI; Mazefsky et al., 2018, 2020), for example, is a measure of emotion regulation that has scales for reactivity and dysphoria. This questionnaire was rated as "excellent" on a systematic review of emotion regulation measures done by Mazefsky et al., (2021). These measures were collected as part of a larger study on COVID-19, where many of the questions were asked within the context of the pandemic. We did not frame the ERQ or dysphoria questions in terms of COVID-19, but participants may have been primed to think about and internally reference the pandemic when completing these measures. If these questionnaires had been framed regarding the pandemic, although they have not been validated to be used in this way, it would have provided a more direct understanding of whether our findings do refer to the pandemic more specifically. In future research expanding on this topic, additional or different measures should be considered.

In conclusion, we assessed which of two different emotion regulations were associated with better mental health outcomes during the early days of the COVID-19 pandemic in an undergraduate sample. While our hypothesis that cognitive reappraisal would be associated with lower dysphoria symptoms dependent on COVID-19 risk perception were not supported, there were significant main effects in expected directions. In line with prior work, cognitive reappraisal and dysphoria symptoms were inversely related, but expressive suppression and dysphoria symptoms had a positive relation. Cognitive reappraisal may be a better emotion regulation strategy if employed during a stressful, uncertain time, to protect mental health.

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