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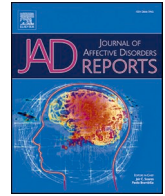
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# Depression and looming cognitive style: Examining the mediating effect of perceived control

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## A B S T R A C T

*Background:* Individuals with a looming cognitive style (LCS) bias display a tendency to interpret threat representations as rapidly approaching and rising in risk. The present study is the first to investigate whether the relationship between LCS and depression is mediated by perceived control (over evading threats).
*Methods:* After completing mood questionnaires, participants recorded future-self threats (feared possible selves) and rated their threat representations on a measure of perceived control. LCS was measured using an adapted version of the looming maladaptive style questionnaire. In total 74 participants were recruited through university research participation.
*Results:* Perceived control was significantly related to depression ($r = -.3$, $p = .011$) and LCS ($r = -.27$, $p = .019$) but not to anxiety ($r = -.14$, $p = .223$). Mediation analyses revealed that control mediated the relationship between depression and LCS, when anxiety was entered as a covariate 95 % CI [.03, .79].
*Limitations:* The present study used a measure of symptom severity rather than clinical diagnoses of anxiety and depression. Also, the sample consisted of 81 % female and 100 % university students which limits the generalisability of the findings. Finally, the cross-sectional study design does not imply causation.
*Conclusion:* The present study provided evidence for a potential mechanism through which LCS maintains depression. The analyses have important implications for interventions designed to prevent depression comorbidity. Future studies should apply longitudinal methods to investigate how changes in perceived control influences depression.

## 1. Introduction

Looming cognitive style (LCS) is a cognitive bias towards perceiving and mentally imagining potential danger as rapidly approaching and increasing in risk (Riskind, 1997). This pattern of thinking can act as a cognitive vulnerability for anxiety disorders (Adler and Strunk, 2010; Riskind et al., 2007), and it predicts increases in anxiety symptoms over time (Gonzalez-Diez et al., 2015). Looming cognitive style predicts anxiety beyond the effects of related constructs such as anxiety sensitivity, intolerance of uncertainty and dysfunctional attitudes (Riskind and Rector, 2018).

Although LCS is suggested to be more closely related to anxiety than to depression (Riskind et al., 2000), research suggests that LCS can also significantly contribute to comorbid depression when threat representations are interpreted as inescapable[1] (Hong et al., 2017; Tzur-Bitan et al., 2012). For example, Levin et al. (2007) found that LCS for patients with terminal leukaemia predicted anxiety and depression – potentially

because they felt helpless to evade the threat of illness or death. The present study represents the first to examine whether perceived control (over evading threats) mediates the relationship between LCS and depression.

Threat representations perceived as uncontrollable could mediate the relationship between LCS and depression by contributing to avoidance coping which could foster feelings of hopelessness (Choi and Shin, 2023; Kleiman and Riskind, 2012). Indeed, according to the helplessness-hopelessness hypothesis (Alloy et al., 1990) anxiety and helplessness can develop into depression and hopelessness when negative events are perceived as inescapable. Therefore, given the relationship between hopelessness and control (Choi and Shin, 2023), it is not unreasonable for the present study to suggest that perceived control (over evading threats) could act as a mechanism through which LCS maintains depression.

LCS is measured with the looming maladaptive style questionnaire (Riskind et al., 2000). It consists of six hypothetical scenarios that depict

potentially threatening events. Participants are instructed to imagine themselves in these situations and answer three Likert-style questions. However, previous studies have not assessed whether participants were able to successfully visualize the hypothetical scenarios and whether this affects LCS. This is important because individuals who have less clear images of threats may not imagine these outcomes as so imminent or intense, and thus may have a lower tendency to perceive threat in a looming manner. For this reason, the present study will also examine the clarity of threat representations and their relationship to LCS.

Furthermore, in contrast to previous research, participants will be asked to create feared possible selves - mental representations of future-self threats (Markus and Nurius, 1986) as opposed to imagining hypothetical scenarios. Feared possible selves reflect the future self-concept and represent thoughts that include the type of person one fears to become. The present study proposes that feared possible selves will capture a higher level of specificity since hypothetical scenarios may not be personally relevant and thus, less impactful to depressive symptomology. For a detailed integration of LCS and the theory of possible selves see Riskind and Calvete (2020).

Thus, the main aim of the present article was to examine whether perceived control (over evading threats) mediated the relationship between LCS and depression. It was predicted that perceived control would mediate the relationship between LCS and depression. Also, in line with previous research (Hong et al., 2017), it was predicted that anxiety and depression would be significantly related to LCS. However, due to limited research evidence, it was unclear how the clarity of threat representations will be related to LCS, anxiety or depression. For this reason, no predictions were made, instead the analyses were exploratory.

## 2. Methodology

### 2.1. Participants

Seventy-four participants, aged between 18 and 61 years (60 female, 9 male, 5 other, mean age = 21.35, SD = 7.03) were recruited through university research participation and received points as partial fulfilment to a module requirement.[2] The study was approved by York St John ethics committee. All participants provided informed consent. A minimal sample size of 66 was determined based on a priori power analysis conducted on RStudio with the WebPower package.

### 2.2. Materials

#### 2.2.1. Generalised anxiety disorder questionnaire (GAD-7)

The Generalised Anxiety Disorder Questionnaire (GAD-7) (Spitzer et al., 2006) is a 7-item measure assessing generalised anxiety. Items are rated on 4-point scales (0= not at all, 3= nearly every day). Scores range from 0 to 21. Greater scores indicate greater anxiety symptomology. The GAD-7 demonstrates good internal consistency and validity (Sun et al., 2021).

#### 2.2.2. Center for epidemiologic studies depression scale (CES-D)

The Center for Epidemiologic Studies Depression Scale (Eaton et al., 2004) is a 20-item measure assessing the frequency of depressive symptomology. Items are rated on 4-point scales (0= not at all, 3= nearly every day). Scores range from 0 to 60. Greater scores indicate greater depressive symptomology. The CES-D demonstrates good reliability and validity (Devins et al., 1988).

#### 2.2.3. Feared possible self task

Participants were first introduced to the concept of feared possible selves (*"Feared possible selves are mental representations of the self in negative future states. In this part of the task, you will be asked to write what you fear to be in the future."*) and were presented with examples (i.e., *homeless, alone and arrogant*). Participants then described what they

feared to be (*"In the future, I want to avoid being (please provide 1 feared self below)"*) consistent with previous research (Patrick et al., 2002). Next, participants were asked questions addressing control (*"I am in control of avoiding this future self."*) and clarity (*"images of this thought are hazy, not clear at all"*). The questions were assessed on a 5-point Likert scale (strongly disagree = 1- strongly agree = 5). The participants could record as many possible selves as they could think of, but they had to record a minimum of one representation.

#### 2.2.4. The looming maladaptive style questionnaire (LMSQ)

An adapted version of the Looming Maladaptive Style Questionnaire (Riskind et al., 2000) was used to assess looming cognitive style (see introduction for more information regarding the original format). First, participants created their own future self-threats in the feared possible self-task. Then, the participants responded to three Likert questions per thought. Questions were rated on a 5-point scales ranging from 1 (not at all) to 5 (very much).

The questions were: (1) "In the present are the chances of this occurring decreasing, or increasing and expanding with each moment?" (2) "Is the level of threat that this feared self poses fairly constant, or is it growing rapidly larger with each passing moment?" (3) "How much do you visualize the threat that this poses becoming progressively worse?". Scores were summed to create a looming maladaptive style score for each thought. Mean looming maladaptive style score was then calculated for each participant. Higher scores indicate greater LCS. The LMSQ demonstrates good psychometric properties (Hong et al., 2017).

### 2.3. Procedure

The study was presented on Qualtrics (Qualtrics, Provo, UT), and the participants could complete the study in a place of their choosing. Following the consent procedure, the participants completed a demographics questionnaire, the GAD-7, and the CES-D. The order in which the questionnaires were presented was randomised. The participants then completed the feared possible selves task. After recording each feared possible self, the participants completed the looming maladaptive style questionnaire. The study took on average 20 min to complete.

### 2.4. Data analysis

Statistical analyses were performed using Statistical Package for the Social Sciences version 28. Spearman's correlation coefficients were used to examine the relationship between LCS, depression, anxiety, perceived control, and clarity. The mediation model was tested using Hayes' PROCESS macro with 5000 bootstrap samples. Significance was set at $p < .05$. The indirect effect was considered significant if confidence intervals did not contain zero.

## 3. Results

On average participants recorded 1.69 future self-threats (SD = .84, range=1–5). Table 1 displays the descriptive statistics and Spearman's rank correlations. First, there was a significant relationship between anxiety and the clarity of threat representations ($r = .32$, $p = .005$) whereby anxiety increased, as the clarity of threat representations increased. However, there was no significant relationship between the clarity of threat representations and LCS ($r = .07$, $p = .570$) or depression ($r = .22$, $p = .06$). Next, in line with predictions, there was a significant relationship between anxiety and LCS ($r = .48$, $p<.001$) whereby anxiety increased as looming cognitive style increased. LCS was also significantly related to depression ($r = .45$, $p<.001$) whereby depression increased as LCS increased. Finally, perceived control was significantly related to depression ($r =-.3$, $p = .011$) and LCS ($r =-.27$, $p = .019$) but was not significantly related to anxiety ($r =-.14$, $p = .223$). Thus, as depression and LCS increased, perceived control over threats decreased.

**Table 1**

Correlational matrix for threat characteristics and psychometric scores.

|  | M | SD | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| 1. GAD-7 | 10.36 | 5.52 | | | | |
| 2. CESD | 23.92 | 13.51 | .76*** | | | |
| | | | [.63, .84] | | | |
| 3. Clarity | 2.58 | 1.03 | .32** | .22 | | |
| | | | [−.52, −.09] | [−.43, .02] | | |
| 4. Control | 3.97 | .90 | −.14 | −.3* | −.02 | |
| | | | [−.37, .1] | [−.5, −.07] | [−.26, .2] | |
| 5. LCS | 12.74 | 2.96 | .48*** | .43*** | .07 | −.27* |
| | | | [.27, .64] | [.24, .62] | [−.3, .17] | [−.48,−.04] |

Note: *$p<.05$, **$p<.01$, ***$p<.001$, LCS=Looming cognitive style, GAD-7 = Generalised Anxiety Disorder Questionnaire 7, CESD= Center for Epidemiologic Studies depression scale.

### 3.1. Mediation analysis

A mediation analysis was performed to investigate whether the relationship between depression and LCS is mediated by perceived control over threat representations. The outcome variable in the analysis was depression, the predictor variable was LCS, and the mediator was perceived control. Anxiety was included in the model as a covariate. First, LCS significantly predicted control $b=-.1$, 95 %CI$[-.19,-.00]$, $t=-2.02$, $p=.047$. Control significantly predicted depression $b=-3.29$, 95 %CI $[-5.6,-.99]$, $t=-2.85, p=.006$. LCS did not significantly predict depression (the direct effect) $b = .11$, 95 %CI $[-.83, 1.05]$, $t = .23$, $p=.815$. However, the indirect effect via control was significant $b = .31$, 95 % CI $[.03,.79]$.

## 4. Discussion

The present study represents the first to examine how perceived control (of evading threats) relates to anxiety, depression, and LCS. The results of this cross-sectional study revealed that perceived control mediated the relationship between LCS and depression. The results as well as future directions and limitations are discussed below.

First, the main aim of the present study was to investigate whether perceived control mediated the relationship between LCS and depression. The results showed that there was a significant relationship between depression, LCS, and control whereby depression and LCS increased as perceived control decreased. When entered in a mediation analysis, perceived control mediated the relationship between LCS and depression. This is consistent with the literature which proposes that LCS contributes to comorbid depression when threats are perceived as inescapable (Hong et al., 2017; Tzur-Bitan et al., 2012). Thus, LCS predicts anxiety (Gonzalez-Diez et al., 2015), however, it can also contribute to depression when threats are perceived as uncontrollable. As discussed in the introduction, uncontrollable threats could contribute to avoidance coping which could foster feelings of hopelessness (Kleiman and Riskind, 2012). The analyses have important implications for understanding anxiety-depression comorbidity. Future research should investigate the clinical implications of these findings, for instance, can interventions designed to increase perceived control prevent depression in populations with high LCS.

A secondary aim of the present study was to investigate the relationship between LCS and the clarity of threat representations. The present study included a measure of clarity because individuals who have less clear and less vivid images of threats may not imagine these outcomes as so imminent or intense, and thus may have a lower tendency to perceive threat in a looming manner (Mathews et al., 2013). The results here showed that the clarity of threat representations was not significantly related to LCS and so does not influence the tendency to perceive threat in a looming manner. However, future research should aim to replicate these results whilst employing a measure of the dynamic content of threat imagery as a "rolling video" rather than a still photograph, which has been shown to be related to LCS (Riskind et al., 2000).

There was also no significant relationship between clarity and depression. It is worth noting however, that there was a significant relationship between anxiety and clarity whereby, the clarity of threat representations increased as anxiety increased. Future studies should investigate the mechanism through which clarity could maintain anxiety for instance, do clearer self-threats facilitate a more negative perception of the self in the present. As a result, more anxious individuals will feel inadequate and incapable of managing threats, thus maintaining anxiety (Riskind and Maddux, 1993).

### 4.1. Limitations and future directions

Specific aspects of the present study reduce the generalisability of the findings. First, the sample was restricted to university students and consisted of 81 % female. Second, the present study used a measure of symptom severity rather than clinical diagnoses of depression and anxiety. Future studies should examine threat representations in clinical samples to investigate the generalisability of the findings to populations with a diagnosis of depression and anxiety. Finally, since a cross sectional design was employed, and a mediation analysis was conducted, the present study cannot infer causation.[3] Instead, future studies should investigate how changes in threat characteristics overtime influence depression, for example, if threats are perceived as more controllable, does this reduce levels of depression? This could involve investigating the effectiveness of interventions designed to increase perceived control.

## 5. Conclusion

The results of this study reveal that perceived control mediated the relationship between LCS and depression. Thus, LCS could be worthy of examining further as a key maintaining factor in depression, as well as anxiety, but only when threat representations are interpreted as uncontrollable. The analyses contribute to our understanding of anxiety-depression comorbidity and present opportunities for interventions aimed at preventing depression. Future studies should apply longitudinal methods to investigate how changes in perceived control influence depressive symptomology.

**Declaration of Competing Interest**

None

**Supplementary materials**

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jadr.2023.100698.

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