



## Brief Report

# Self-critical perfectionism is a vulnerability factor for depression but not anxiety: A 12-month, 3-wave longitudinal study



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## ABSTRACT

It is unclear whether perfectionism is an antecedent of depressive symptoms, a consequence of depressive symptoms, or both. Furthermore, no study has tested reciprocal relations between perfectionism and anxiety symptoms, despite theory suggesting perfectionism both leads to, and results from, anxiety symptoms. We recruited 302 undergraduates and tested reciprocal relations between self-critical perfectionism and depressive and anxiety symptoms using a 12-month, 3-wave longitudinal design. Self-critical perfectionism predicted increases in depressive symptoms; depressive symptoms did not predict changes in self-critical perfectionism. Self-critical perfectionism was also a concomitant of, but not an antecedent or consequence of, anxiety symptoms. Results complement theory suggesting self-critical perfectionism is a vulnerability factor for depressive symptoms.

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## 1. Introduction

Depression and anxiety are commonly co-occurring problems with symptoms that may be conceptualized on a continuum from mild to severe. Given the common, impairing, and costly nature of these symptoms (McGrath et al., 2012), it is important to understand if personality traits, such as perfectionism, are important contributors to depressive and anxiety symptoms. Identification of such traits will point toward assessment and treatment targets.

Perfectionism is linked to many problems, including depressive and anxiety symptoms (Hewitt & Flett, 1991). Evidence suggests there is a distinction between perfectionistic strivings (rigidly and ceaselessly demanding perfection of oneself) and self-critical perfectionism (nagging doubts about performance abilities, negative reactions to perceived failures, excessive concern of others' evaluations, and intense self-rebuke; Dunkley, Zuroff, & Blankstein, 2003). Because perfectionistic strivings are generally unrelated to depressive and anxiety symptoms (Graham et al., 2010), we focus on self-critical perfectionism here. Research (Dunkley et al., 2003) indicates self-critical perfectionism involves four constructs: self-criticism (Blatt, D'Afflitti, & Quinlan, 1976),

socially prescribed perfectionism (Hewitt & Flett, 1991), concern over mistakes, and doubts about actions (Frost, Marten, Lahart, & Rosenblate, 1990).

One potential explanation for the link between self-critical perfectionism and depressive or anxiety symptoms is the vulnerability model, which asserts self-critical perfectionism predicts increased depressive and anxiety symptoms over time. This model is tested with longitudinal designs, with evidence suggesting people high in self-critical perfectionism are vulnerable to increased depressive symptoms (McGrath et al., 2012; Sherry, Mackinnon, Macneil, & Fitzpatrick, 2013). Less is known about perfectionism as a vulnerability factor for anxiety symptoms. Among the very few studies in this area, results are mixed, with studies both confirming (Einstein, Lovibond, & Gaston, 2000) and failing to confirm (Vohs et al., 2001) the vulnerability model of perfectionism predicting anxiety symptoms. These inconsistencies may arise from studying different age groups or using different measures of perfectionism.

Another possible explanation for the association between self-critical perfectionism and depressive or anxiety symptoms is the complication/scar model, which maintains depressive or anxiety symptoms contribute to either permanent changes in personality (i.e., scar effects) or transient changes in personality (i.e., complication effects; McGrath et al., 2012). Our study used a 12-month longitudinal design, and therefore tests complication effects. There is support for the complication model of perfectionism and depressive symptoms (McGrath et al., 2012), but not all studies support this model (Hawley, Ho, Zuroff, & Blatt, 2006). Tests of this model

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involve diverse samples, timeframes, and measures, which may account for inconsistencies. Additional research is needed to confidently (dis)confirm the complication model. Many cross-sectional studies reveal correlations between perfectionism and anxiety symptoms (Kawamura, Hunt, Frost, & DiBartolo, 2001). However, these studies do not illuminate questions of temporal precedence or directionality. To our knowledge, there are no longitudinal studies testing the complication/scar model of perfectionism and anxiety symptoms.

One other potential explanation for the association between self-critical perfectionism and depressive or anxiety symptoms is the reciprocal relations model, which integrates both the vulnerability and complication models. This model posits changes in self-critical perfectionism contribute to increases in depressive or anxiety symptoms and vice versa (Fig. 1). Despite some preliminary support for the reciprocal relations model of perfectionism and depressive symptoms (McGrath et al., 2012), very few studies test this model. Of these studies, our research improves on their methods. Unlike McGrath et al.'s (2012) 1-week measurement intervals, our study uses 6-month measurement intervals to allow more time for personality change. Whereas most studies in this area analyze two waves of data (Vohs et al., 2001), we analyze three waves, thereby capturing a broader and potentially more representative slice of change. Our study will also be the first (we know of) to test reciprocal relations between perfectionism and anxiety symptoms, a surprising omission given numerous calls to clarify questions of directional influence between these variables (Bieling, Summerfeldt, Israeli, & Antony, 2004).

We conducted a 12-month, 3-wave longitudinal study (with 6-month measurement intervals) that tested reciprocal relations between self-critical perfectionism and depressive and anxiety symptoms (Fig. 1). Self-critical perfectionism is strongly stable over time, more than depressive and anxiety symptoms (McGrath et al., 2012). Based on past evidence (Graham et al.,

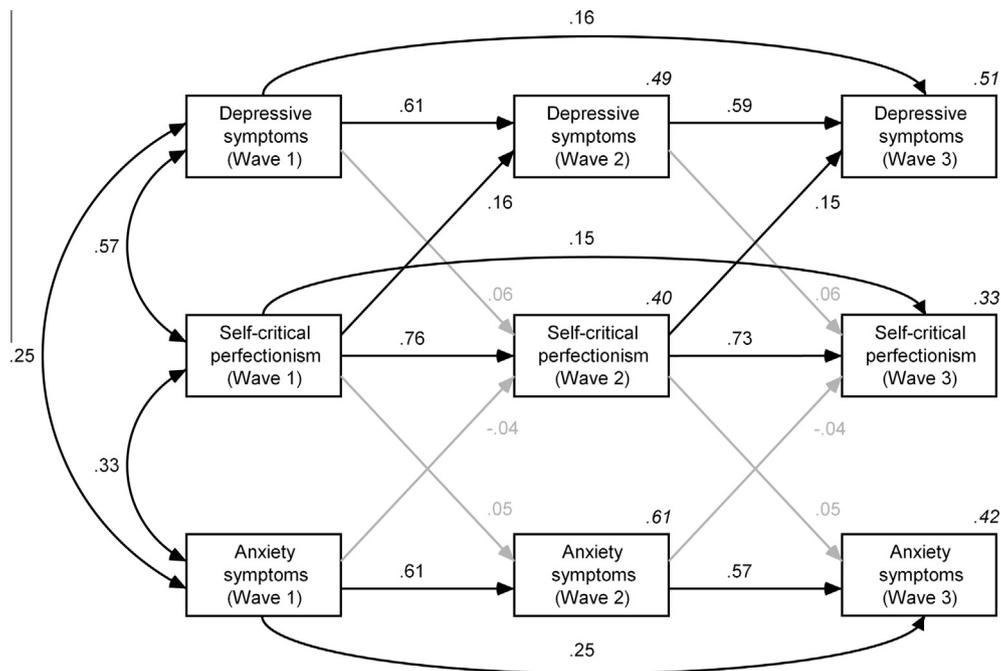
2010; Sherry et al., 2013), we hypothesized first-order autoregressive paths for self-critical perfectionism (capturing rank-order interindividual stability) would show the highest stability, and first-order autoregressive paths for depressive and anxiety symptoms would show somewhat lower stability (vs. self-critical perfectionism). First-order autoregressive paths are immediately adjacent paths (e.g., depressive symptoms at Wave 1 → depressive symptoms at Wave 2).

Building on earlier theory and evidence (Bieling et al., 2004; McGrath et al., 2012), we hypothesized reciprocal relations between self-critical perfectionism and depressive and anxiety symptoms as seen in Fig. 1 (i.e., self-critical perfectionism will predict changes in depressive and anxiety symptoms and vice versa). Self-critical perfectionism involves traits, such as harsh self-rebuke and nagging doubts about performance abilities, which are believed to be part of the personality of people vulnerable to depressive and anxiety symptoms (McGrath et al., 2012). Depressive and anxiety symptoms may also complicate self-critical perfectionism, with the affect, cognition, and behavior comprising depressive and anxiety symptoms exacerbating self-critical perfectionism (McGrath et al., 2012). For example, behavioral avoidance (e.g., skipping class) is a hallmark of depressive and anxiety symptoms, which may contribute to self-critical perfectionists' feelings of failure and imperfection.

## 2. Method

### 2.1. Participants

We recruited 302 undergraduates (219 women) from the Department of Psychology at Dalhousie University. Perfectionism, depression, and anxiety are common problems among undergraduates (Johnson & Hayes, 2003). Most participants identified as Caucasian (90.1%). At Wave 1, participants averaged 20.84 years of



**Fig. 1.** Hypothesized reciprocal relations model showing cross-lagged path analyses with paths constrained to equality across waves. Rectangles represent measured variables. Double-headed black arrows represent significant correlations ( $p < .05$ ); single-headed black arrows represent significant paths ( $p < .05$ ); single-headed gray arrows represent nonsignificant paths ( $p > .05$ ). Path coefficients are standardized. Italicized numbers in the upper right corner of rectangles (e.g., .51 for Depressive symptoms at Wave 3) represent the amount of variance explained by associated exogenous variables (i.e.,  $R^2$  values). Unstandardized path coefficients were constrained to equality; however, standardized path coefficients may vary slightly. Cross-wave correlated errors (e.g., error for self-critical perfectionism at Wave 2 correlated with error for self-critical perfectionism at Wave 3) were specified a priori. Error terms are not displayed.

**Table 1**  
Bivariate correlations.

Variables	Wave 1		Wave 2			Wave 3			
	1	2	3	4	5	6	7	8	9
<i>Wave 1</i>									
1. Self-critical perfectionism	–	.55	.31	<b>.76</b>	.56	.21	<b>.75</b>	.49	.25
2. Depressive symptoms	–	.22	.50	<b>.72</b>	.19	.48	<b>.66</b>	.12	
3. Anxiety symptoms	–	–	.24	.27	<b>.68</b>	.20	.18	<b>.63</b>	
<i>Wave 2</i>									
4. Self-critical perfectionism				–	.54	.36	<b>.80</b>	.46	.27
5. Depressive symptoms				–	.37	.42	<b>.62</b>	.18	
6. Anxiety symptoms				–	.17	.12	<b>.71</b>		
<i>Wave 3</i>									
7. Self-critical perfectionism							–	.51	.31
8. Depressive symptoms							–	.21	
9. Anxiety symptoms								–	

Note: Test–retest correlations appear in bold. A bivariate correlation around .10 is a small effect size; .30 is a medium effect size; .50 is a large effect size. Bivariate correlations  $\geq .17$  are significant at  $p < .05$ .

age ( $SD = 3.95$ ). This sample resembles other undergraduate samples recruited from Canadian universities (Graham et al., 2010).

## 2.2. Measures

### 2.2.1. Self-critical perfectionism

Four subscales were used to measure self-critical perfectionism: Self-Criticism, Socially Prescribed Perfectionism, Concern Over Mistakes, and Doubts About Actions (see below). Using multiple subscales reduces reliance on the potentially idiosyncratic properties of any single subscale. Evidence supports the reliability and validity of these subscales (Graham et al., 2010). Alpha reliabilities were good in our study (i.e., .82–.87; Supplementary Table 1). We used the 5-item short form of Bagby, Parker, Joffe, and Buis' (1994) Depressive Experiences Questionnaire Self-Criticism subscale (e.g., "I don't live up to my ideals") and the 5-item short form of Hewitt and Flett's (1991) Multidimensional Perfectionism Scale Socially Prescribed Perfectionism subscale (e.g., "My family expects me to be perfect"). Items for these subscales were rated on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). We used the 5-item short form of Frost et al.'s (1990) Multidimensional Perfectionism Scale Concern Over Mistakes subscale (e.g., "The fewer mistakes I make, the more people will like me") and the 4-item short form of Frost et al.'s (1990) Doubts About Actions subscale (e.g., "I have doubts about the simple everyday things I do"). Items for these subscales were rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

### 2.2.2. Depression and anxiety symptoms

We measured depressive and anxiety symptoms using subscales from Watson et al.'s (1995) Mood and Anxiety Symptoms Questionnaire (MASQ; see below). Research supports the reliability and validity of these subscales (Watson et al., 1995). Alpha reliabilities were good-to-excellent in our study (i.e., .87–.94; Supplementary Table 1). We used a modified<sup>1</sup> 21-item MASQ-Anhedonic Depression subscale to measure depressive symptoms (e.g., "felt optimistic;" reverse scored) and the 17-item MASQ-Anxious Arousal subscale to measure anxiety symptoms (e.g., "felt faint"). Items for these subscales were rated on a 5-point scale from 1 (*not at all*) to 5 (*extremely*).

<sup>1</sup> One item from the MASQ-Anhedonic Depression subscale ("thoughts about death or suicide") was removed. Participants completed this subscale on a website, meaning it was not possible to respond effectively if participants endorsed this item.

## 2.3. Procedure

Our study was approved by Dalhousie University's Health Sciences Research Ethics Board. Across waves, participants completed identical online questionnaires and, following Wave 1, participants received reminder emails at 6-month intervals to complete Waves 2 and 3. All participants received weekly telephone reminders until the questionnaire was completed, the participant acknowledged refusal, or a period of three months elapsed after the original reminder. Participants completed Wave 2, on average, 193.89 ( $SD = 22.97$ ) days after Wave 1 (range = 152–286 days). Participants completed Wave 3, on average, 186.34 ( $SD = 32.43$ ) days after Wave 2 (range = 90–303 days); 83.4% of participants completed Wave 2 and 72.2% of participants completed Wave 3. Participants completed consent forms at the beginning of our study, and were debriefed and compensated upon completion; participants received \$10.00 at Waves 1 and 2 and \$15.00 at Wave 3 or one psychology credit per wave completed.

## 2.4. Data analytic strategy

Cross-lagged path analyses in Mplus 6.0 were used to test the reciprocal relations model in Fig. 1. We provide a covariance matrix for researchers interested in estimating alternative models using our data (Supplementary Table 2). A Monte Carlo simulation with Mplus 6.0 was used in power analyses (Muthén & Muthén, 2010). We used 10,000 resamples and a 25.0% attrition rate. Based upon past research (McGrath et al., 2012), we also used medium effect sizes for cross-lagged paths and large effect size for autoregressive paths. A sufficiently powerful model has parameter and standard error biases  $< 5.0\%$ , confidence interval coverage between 91.0% and 98.0%, and power  $> .80$ . Our sample of 302 participants met or exceeded these power requirements for all analyses.

## 3. Results

### 3.1. Missing data

Five percent of data were missing, and data were missing completely at random based on a nonsignificant missing completely at random test,  $\chi^2(305) = 272.02, p = .91$ . Missing data were addressed using full information maximum likelihood estimation. Participants who dropped out were not significantly different ( $p < .05$ ) from participants who completed all waves on any of the study variables.

### 3.2. Descriptive statistics and multivariate normality

Means, alpha reliabilities, and standard deviations appear in Supplementary Table 1. Means were within one standard deviation of means from earlier research using undergraduates (Graham et al., 2010), suggesting our means are comparable to earlier research. Small's omnibus test indicated multivariate nonnormality in our data (Muthén & Muthén, 2010). We used Mplus' maximum likelihood parameter estimator, which provides accurate estimates even if multivariate normality is violated (Muthén & Muthén, 2010).

### 3.3. Bivariate correlations

Self-critical perfectionism measures were standardized and summed. Self-critical perfectionism, depressive symptoms, and anxiety symptoms were significantly correlated with each other across waves with two exceptions (depressive symptoms at Wave 1 did not significantly correlate with anxiety symptoms at Wave 3

and anxiety symptoms at Wave 2 did not significantly correlate with depressive symptoms at Wave 3; see Table 1). Test–retest correlations were strong, ranging from .75 to .80 for self-critical perfectionism, from .62 to .72 for depressive symptoms, and from .63 to .71 for anxiety symptoms.

### 3.4. Cross-lagged path analyses

Cross-lagged path analyses tested reciprocal relations between self-critical perfectionism and depressive symptoms and between self-critical perfectionism and anxiety symptoms (Fig. 1). These analyses accounted for possible third variable explanations; for example, does the link between self-critical perfectionism at Wave 2 and depressive symptoms at Wave 3 hold after taking depressive symptoms at Wave 2 into account?

Acceptable model fit is indicated by values around .08 for the root mean square error of approximation (RMSEA) and around .95 for the comparative fit index (CFI) and Tucker-Lewis index (TLI). An unconstrained model (with paths free to vary) was compared to a constrained model (with like paths constrained to equality). If the  $\Delta$ CFI value was  $<|.01|$ , then these models do not significantly differ (Cheung & Rensvold, 2002) and the model with the fewest parameters (i.e., the most parsimonious model) was preferred.

First, we tested an unconstrained reciprocal relations model. This model fit well:  $\chi^2(7, N = 301) = 9.77, p > .05$ ; RMSEA = .036; CFI = .996; TLI = .983. Then, we tested a constrained reciprocal relations model. This model also fit well:  $\chi^2(14, N = 301) = 21.74, p > .05$ ; RMSEA = .043; CFI = .990; TLI = .976. Model fit did not deteriorate after equality constraints were applied ( $\Delta$ CFI =  $-.006$ ), indicating that the constrained model did not significantly differ from the unconstrained model. As the constrained model was more parsimonious than the unconstrained model, the constrained model was preferred and used in subsequent analyses.

In the constrained model, first-order autoregressive paths for self-critical perfectionism, depressive symptoms, and anxiety symptoms were significant (Fig. 1). As hypothesized, first-order autoregressive paths for self-critical perfectionism exhibited the highest stability, and first-order autoregressive paths for depressive and anxiety symptoms exhibited somewhat lower stability (vs. self-critical perfectionism). Second-order autoregressive paths from Wave 1 variables to Wave 3 variables (e.g., anxiety symptoms at Wave 1  $\rightarrow$  anxiety symptoms at Wave 3) were significant, albeit much smaller in magnitude ( $\beta < .25$ ) vs. first-order autoregressive paths (Fig. 1).

In addition, as hypothesized, self-critical perfectionism predicted significant increases in depressive symptoms (Fig. 1). Counter to hypotheses, depressive symptoms did not predict significant increases in self-critical perfectionism. Moreover, self-critical perfectionism did not predict significant increases in anxiety symptoms, and anxiety symptoms did not predict significant increases in self-critical perfectionism.<sup>2</sup>

## 4. Discussion

Our rigorous study advanced research on reciprocal relations between perfectionism and depressive and anxiety symptoms.

<sup>2</sup> We included paths from depressive symptoms at one wave to anxiety symptoms at another wave and vice versa. Both depressive symptoms at Wave 1 predicting anxiety symptoms at Wave 2 ( $\beta = -.01$ ) and depressive symptoms at Wave 2 predicting anxiety symptoms at Wave 3 ( $\beta = -.01$ ) were nonsignificant ( $p > .05$ ). Anxiety symptoms at Wave 1 predicting depressive symptoms at Wave 2 ( $\beta = .03$ ) and anxiety symptoms at Wave 2 predicting depressive symptoms at Wave 3 ( $\beta = .03$ ) were also nonsignificant ( $p > .05$ ). After including these paths, all paths in Fig. 1 were virtually unchanged in magnitude and significance, and self-critical perfectionism still predicted significant increases in depressive symptoms.

First-order autoregressive paths indicated constructs in our study exhibited strong rank-order interindividual stability, with self-critical perfectionism showing the highest stability, and depressive and anxiety symptoms showing somewhat lower stability (vs. self-critical perfectionism). Support for the reciprocal relations model was mixed. Self-critical perfectionism was a vulnerability for, but not a complication of, depressive symptoms. We also conducted the first test of reciprocal relations between perfectionism and anxiety and found self-critical perfectionism was neither an antecedent nor a consequence of anxiety symptoms. Instead, self-critical perfectionism was a concomitant of anxiety.

### 4.1. Stability

As hypothesized, first-order autoregressive paths suggested self-critical perfectionism exhibited the strongest rank-order interindividual stability. These results are congruent with views of self-critical perfectionism as a stable trait (Dunkley et al., 2003). Our study extends the scarce literature on the stability of self-critical perfectionism (see McGrath et al., 2012, who used 1-week measurement intervals to show self-critical perfectionism is strongly stable). Depressive and anxiety symptoms were also strongly stable, but still somewhat lower in stability than self-critical perfectionism. This finding is consistent with our hypotheses and theory and research suggesting depressive and anxiety symptoms are persistent (McGrath et al., 2012).

### 4.2. Self-critical perfectionism and depressive symptoms

Congruent with hypotheses, our study supports the vulnerability model and suggests self-critical perfectionism may be a personality vulnerability for depressive symptoms. This finding, along with past research (Dunkley et al., 2003), suggests the vulnerability model is one plausible way of conceptualizing the perfectionism–depressive symptoms connection.

Incongruent with hypotheses, our study does not support the complication model (i.e., depressive symptoms did not predict self-critical perfectionism). Research has produced mixed findings regarding the complication model, with some studies confirming (McGrath et al., 2012) and others failing to confirm (Hawley et al., 2006) this model. Future research might test a moderator model (e.g., depressive symptoms may predict increases in self-critical perfectionism only when behavioral avoidance is high).

### 4.3. Self-critical perfectionism and anxiety symptoms

Contrary to hypotheses, our findings indicate self-critical perfectionism is neither a vulnerability for, nor a complication of, anxiety symptoms. Several studies suggest perfectionism is not a vulnerability factor for anxiety symptoms (Vohs et al., 2001). As the first study (we know of) to test if perfectionism is a complication of anxiety symptoms, our null findings should be interpreted cautiously. Our null findings may be due to the measurement intervals used (our 6-month measurement intervals did not capture shorter-term relations between anxiety and perfectionism), the anxiety measure used (we measured predominantly physiological symptoms of anxiety), or the perfectionism measure used (we did not assess perfectionistic strivings). Overall, our results suggest a concomitant link where self-critical perfectionism and anxiety symptoms co-occur without exerting a temporal influence on each other.

### 4.4. Limitations and future directions

Our study involved a homogenous sample (i.e., undergraduate, predominately Caucasian, and female) and assessed sub-clinical

depressive and anxiety symptoms, making it hard to discern if our findings generalize to other populations (e.g., patients with anxiety disorders). Future work might also test a spectrum model examining if there is a continuum underlying normal-range traits (e.g., self-critical perfectionism), sub-clinical symptoms (e.g., depressive symptoms), and severe pathology (e.g., major depressive disorder; Blatt, D'Afflitti, & Quinlan, 1976).

Our self-report measures may also be inaccurate (e.g., subject to limited insight). Future studies should collect informant reports. Shortened scales were also used to reduce participant burden; however, little is known about how our shortened scales compare to the original scales. Causality should also not be inferred from our longitudinal design, as this design lacks random assignment and experimental control. Some authors argue that cross-lagged path analyses confound trait and state variance, and these authors instead encourage estimation of trait-state-error or trait-state-occasion models, which permit decomposition of variance into time-invariant (trait) and time-variant (state) components (Cole, 2012). As cross-lagged models may suffer from problems due to unspecified trait influences, studies estimating trait-state-error or trait-state-occasion models are needed. Optimally, large samples ( $N > 500$ ), latent variables, and  $\geq 4$  waves of data are used to estimate such trait-state models (Cole, 2012).

#### 4.5. Concluding remarks

Our novel, 12-month, 3-wave longitudinal study suggests self-critical perfectionism is a persistent vulnerability for (but not a complication of) depressive symptoms. Our findings also indicate self-critical perfectionism may be a concomitant of anxiety symptoms.

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#### Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.jrp.2014.05.004>.

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