



Is self-critical perfectionism an antecedent of or a consequence of social anxiety, or both? A 12-month, three-wave longitudinal study



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ABSTRACT

Cross-sectional research suggests a relationship between perfectionism and social anxiety. However, research has not examined the direction of this relationship using a longitudinal design. Perfectionism may be an antecedent or consequence of social anxiety, or both. Our study tested reciprocal relations between self-critical perfectionism (i.e., intense self-rebuke, negative reactions to perceived failures, and nagging self-doubt about actions) and social anxiety. We hypothesized that self-critical perfectionism would be both an antecedent and a consequence of social anxiety. A 3-wave, 12-month longitudinal design was used to test the hypotheses. Waves were spaced 6 months apart. Participants ($N = 301$ undergraduates) completed measures in the lab at Wave 1. Online questionnaires were administered for Waves 2 and 3. Self-critical perfectionism and social anxiety both displayed strong rank-order inter-individual stability. Social anxiety predicted increases in self-critical perfectionism. However, self-critical perfectionism did not predict change in social anxiety. Self-critical perfectionism was a consequence of, but not an antecedent of, social anxiety. Results suggest treatments that reduce social anxiety may also reduce self-critical perfectionism.

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1. Introduction

Social anxiety is marked by fear of social or performance situations, especially in contexts of evaluation or with unfamiliar people. Social anxiety is distinct from shyness, depression, and specific phobia (Beidel & Turner, 2007). The present study conceptualized social anxiety as lying along a continuum of severity from mild to severe. This conceptualization is consistent with evidence suggesting social anxiety is a continuous, quantitative dimension rather than a discrete, qualitative category (Ruscio, 2010).

Theoretical accounts suggest individuals with social anxiety hold unrealistically high standards for performance in social situations, berate themselves for not meeting these standards or for displaying publicly-observable anxiety-related symptoms (e.g., sweating), and believe others judge them negatively as a result of their inadequate performance or display of anxiety (Beck & Emery, 1985; Clark, 2005; Mackinnon, Battista, Sherry, & Stewart,

2014). Consistent with these accounts, empirical research suggests perfectionism is elevated in individuals with social anxiety (Frost, Glossner, & Maxner, 2010).

Ample research suggests perfectionism is a multidimensional personality trait comprised of two key dimensions. The first dimension, self-critical perfectionism, involves nagging self-doubts about actions, negative reactions to perceived failures, and intense self-rebuke (Dunkley, Zuroff, & Blankstein, 2003). Self-critical perfectionism involves a family of traits (e.g., Clara, Cox, & Enns, 2007). At present, there is no single, definitive way to operationalize self-critical perfectionism. We operationalized self-critical perfectionism as self-criticism (Blatt, D'Afflitti, & Quinlan, 1976), concern over mistakes, and doubts about actions (Frost, Marten, Lahart, & Rosenblate, 1990). These three traits are usually included when operationalizing self-critical perfectionism (e.g., Clara et al., 2007). However, other authors have also included socially prescribed perfectionism (Dunkley et al., 2003), discrepancies, or dysfunctional perfectionistic attitudes (Dunkley, Mandel, & Ma, 2014) in operationalizing self-critical perfectionism.

The second dimension, perfectionistic strivings, involves ceaselessly striving toward excessively high, perfectionistic goals (Stoeber & Otto, 2006). Perfectionistic strivings involves a family of traits including self-oriented perfectionism (Hewitt & Flett,

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1991), high standards (Slaney, Rice, Mobley, Trippi, & Ashby, 2001), and high personal standards (Frost et al., 1990).

Our study focuses on self-critical perfectionism as it represents an empirically based synthesis of several key perfectionism models (Blatt, D’Afflitti, & Quinlan, 1976; Dunkley et al., 2003; Frost et al., 1990). Moreover, traits in this family are more strongly related to social anxiety (compared to perfectionistic strivings). In fact, research indicates traits in the perfectionistic strivings family are often unrelated or inversely related to social anxiety (Alden, Ryder, & Mellings, 2002; Shumaker & Rodebaugh, 2009). Despite widespread interest in the relationship between self-critical perfectionism and social anxiety (see Alden et al., 2002), the direction of this relationship is unclear. Three models used to explain this relationship are described next.

1.1. Vulnerability models of self-critical perfectionism and social anxiety

Vulnerability models suggest personality traits come before, and contribute to, psychopathology (Bagby, Quilty, & Ryder, 2008). According to this model, self-critical perfectionism places people at risk for increases in social anxiety over time and is considered an antecedent of social anxiety rather than a concomitant or a consequence. Extensive theory, but no direct evidence, supports this model. For instance, Heimberg, Liebowitz, Hope, and Schneier’s (1995) cognitive-behavioral theory of social anxiety suggests perfectionism makes individuals likely to expect negative social interactions and this results in social anxiety. No longitudinal studies have directly tested the vulnerability model. Some indirect evidence for the impact of perfectionism on social anxiety is provided by treatment research, however. In a 12-session treatment study of 107 patients with social anxiety, Ashbaugh et al. (2007) found pre- to post-treatment decreases in doubts about actions predicted pre- to post-treatment decreases in social phobia. However, this treatment study does not represent a direct test of the vulnerability model, as a deliberate effort was made to reduce the natural course of social anxiety.

1.2. Complication/scar models of self-critical perfectionism and social anxiety

In complication/scar models, psychopathology is thought to come before and contribute to changes in personality (Bagby et al., 2008). This model posits psychopathology results in transient changes in personality that diminish if symptoms are alleviated (a complication effect) or to permanent changes in personality that remain even after symptoms remit (a scar effect). We focus on a complication model as our research design does not permit tests of long-term changes. According to this model, self-critical perfectionism is a consequence of social anxiety rather than an antecedent or a concomitant. Clark’s (2005) cognitive theory of social anxiety suggests people with social anxiety develop self-criticism and unrealistic expectations over time (e.g., lofty standards for performance, conditional beliefs concerning the consequences of less-than-perfect performance, and unconditional self-critical beliefs).

1.3. Reciprocal relations models of self-critical perfectionism and social anxiety

Reciprocal relations models combine the vulnerability and the complication model into a single model where psychopathology and personality traits are reciprocally related. This model views self-critical perfectionism and social anxiety as interrelated variables where changes in self-critical perfectionism are related to changes in social anxiety and vice versa. Despite clear interest in the link between self-critical perfectionism and social anxiety

(e.g., Ashbaugh et al., 2007; Levinson et al., 2013), a reciprocal relations model has yet to be tested. Knowing if self-critical perfectionism is a vulnerability for social anxiety, a complication of social anxiety, or both is important to accurately conceptualizing, researching, preventing, assessing, and treating socially anxious perfectionists. However, there are presently no empirical tests of directionality or temporal precedence when it comes to the perfectionism-social anxiety link.

1.4. Advancing research on self-critical perfectionism and social anxiety

Methodological improvements are needed to advance understanding of the relationship between perfectionism and social anxiety. Most research suggesting associations between perfectionism and social anxiety uses cross-sectional designs (e.g., Levinson et al., 2013), which are ill-suited to testing issues of directionality, stability, and change over time. Multi-wave longitudinal data are needed to test reciprocal relations. Our study uses a 12-month, three-wave longitudinal design that tests the interplay between self-critical perfectionism and social anxiety over time. The present study also combines a multi-wave longitudinal design with a cross-lagged analysis, thereby permitting stronger causal inferences. This approach allows us to rule out competing explanations (e.g., testing if the link between self-critical perfectionism and social anxiety is explained by the stability of self-critical perfectionism). Finally, most research on perfectionism and social anxiety is based on manifest variables (e.g., Ashbaugh et al., 2007). However, evidence suggests latent variables (such as those used in our study) provide more accurate estimates of model parameters and help to differentiate meaningful change from measurement error (Kline, 2005). In sum, our study represents a needed contribution and one of the most rigorous tests to date of the link between perfectionism and social anxiety.

1.5. Objectives and hypotheses

Our goal is to clarify the relationship between self-critical perfectionism and social anxiety by testing the reciprocal relations model (see Fig. 1). Evidence suggests self-critical perfectionism and social anxiety are strongly stable (Gros, Simms, Antony, & McCabe, 2012; McGrath et al., 2012). Thus, we first hypothesized the autoregressive paths for self-critical perfectionism (e.g., Wave

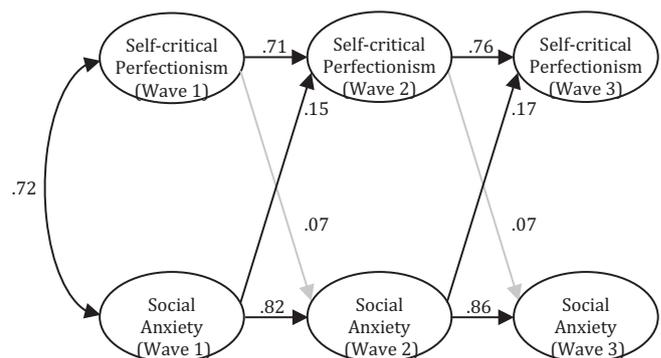


Fig. 1. Hypothesized reciprocal relations model showing cross-lagged analyses. Ovals represent latent variables. Horizontal arrows represent autoregressive paths; diagonal arrows represent cross-lagged paths. Double-headed black arrows represent significant correlations ($p < .05$); single-headed black arrows represent significant paths ($p < .05$); single-headed gray arrows represent non-significant paths ($p > .05$). Path coefficients are standardized. Unstandardized path coefficients were constrained to equality; standardized path coefficients may vary slightly.

1 self-critical perfectionism → Wave 2 self-critical perfectionism) and the autoregressive paths for social anxiety (e.g., Wave 2 social anxiety → Wave 3 social anxiety) will exhibit strong rank-order inter-individual stability. Building on theory (Ashbaugh et al., 2007; Clark, 2005), we also hypothesized reciprocal relations between self-critical perfectionism and social anxiety as seen in Fig. 1. There is a theoretical basis to expect self-critical perfectionism confers vulnerability for social anxiety. Self-critical perfectionism involves traits, such as excessive concerns about others' evaluations and extremely negative reactions to perceived mistakes, which are viewed as part of the premorbid personality of socially anxious people (Heimberg, Liebowitz, Hope, & Schneier, 1995). Theory also suggests self-critical perfectionism may be a complication of social anxiety, with the affect, cognition, and behavior comprising social anxiety exacerbating self-critical perfectionism (Clark, 2005). Perfectionism may be a compensatory strategy used by people who are socially anxious. If they believe they will not be judged harshly when they are perfect, adopting perfectionistic standards and behaviors would be self-protective.

2. Method

2.1. Participants

Using poster ads and Dalhousie University's online participation pool, a convenience sample of 301 undergraduates (71.1% women, 90.0% Caucasian) was recruited. At Wave 1, participants averaged 20.87 years of age ($SD = 4.08$) and 2.38 years of university ($SD = 1.36$). Our sample resembles other samples of undergraduates recruited from Dalhousie University.

2.2. Measures

2.2.1. Self-critical perfectionism

We measured self-critical perfectionism using the 5-item version of the self-criticism subscale (e.g., "I often find I don't live up to my own ideals") of the Depressive Experiences Questionnaire (DEQ; Bagby, Parker, Joffe, & Buis, 1994) along with a 5-item version of the concern over mistakes subscale (e.g., "The fewer mistakes I make, the more people will like me") and the 4-item doubts about actions subscale (e.g., "I usually have doubts about the everyday things I do") from the Frost Multidimensional Perfectionism Scale (FMPS; Frost et al., 1990). The 5-item concern over mistakes subscale was selected based on Cox, Enns, and Clara's (2002) research showing the 5-item version of this subscale has stronger psychometric properties than the original, 9-item version of this subscale. DEQ items are rated on a 7-point scale from 1 (*strongly disagree*) to 7 (*strongly agree*). FMPS items are rated on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Reliability and validity of these three subscales is well-established (e.g., McGrath et al., 2012). Cronbach's alphas were adequate across all waves: self-criticism (.85–.86), concern over mistakes (.86–.88), and doubts about actions (.86–.87).

2.2.2. Social anxiety

We measured social anxiety with the 20-item Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998), the 20-item Social Phobia Scale (SPS; Mattick & Clarke, 1998), and the 24-item avoidance subscale of the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987). The SIAS (e.g., "I feel tense if I am alone with just one person") and SPS (e.g., "I feel awkward and tense if I know people are watching me") are rated on a 5-point scale from 0 (*not at all characteristic or true of me*) to 4 (*extremely characteristic or true of me*). In completing the LSAS, participants indicated the degree to which they avoided specific situations (e.g., "Participating in large

groups") on a 4-point scale from 0 (*Never or 0%*) to 3 (*Usually or 67–100%*). The measures making up our social anxiety latent variable have adequate breadth by including concerns about interactions (the SIAS), fear of scrutiny (the SPS), and behavioral avoidance (the avoidance subscale of the LSAS). Research supports the reliability and the validity of these three scales (Nepon, Flett, Hewitt, & Molnar, 2011; Orsillo, 2001). Cronbach's alphas were adequate across all three waves: SIAS (.93–.94), SPS (.92–.94), and LSAS (.91–.93).

2.3. Procedure

An ethics board approved our study. Participants attended scheduled appointments in the lab for Wave 1 where they provided informed consent and completed measures using an online survey via a lab computer. For Waves 2 and 3, participants completed online surveys from a location of their choosing. Participants completed identical questionnaires across waves. Reminder emails were sent to participants at 6-month intervals after Wave 1; these emails invited participants to complete Waves 2 and 3. Participants also received weekly telephone reminders until they completed the questionnaire, acknowledged refusal, or a period of 3 months elapsed after the original reminder. Participants were compensated either \$10.00 at Waves 1 and 2, and \$15.00 at Wave 3 or one credit point toward their Psychology grade per wave. Participants completed Wave 2, on average, 193.89 ($SD = 22.97$) days after Wave 1. Participants completed Wave 3, on average, 186.34 ($SD = 32.43$) days after Wave 2. Of the 301 participants providing data at Wave 1, 252 participants (83.7%) provided data at Wave 2, and 218 participants (72.4%) provided data at Wave 3.

2.4. Data analytic plan

Using Mplus 6.0, we conducted confirmatory factor analysis (CFA) to test the measurement model and used cross-lagged structural equation modeling to test reciprocal relations between social anxiety and perfectionism. Acceptable model fit is suggested by a $\chi^2/df < 2$, a comparative fit index (CFI) $\geq .95$, and a root mean square error of approximation (RMSEA) $\leq .08$. RMSEA values are reported with 90% confidence intervals (CI).

3. Results

3.1. Missing data analysis

Missing data were minimal (0.0% at Wave 1; 7.5–12.3% at Wave 2; 6.4–8.7% at Wave 3) and data were missing completely at random (MCAR) as indicated by a non-significant Little's MCAR test, $\chi^2 = 152.83$, $p > .05$. Small's test suggested measures were multivariate non-normal (DeCarlo, 1997). To handle missing data and non-normality, maximum likelihood robust estimation in Mplus was used, as it is less biased than other methods (Muthén & Muthén, 2010).

3.2. Descriptive statistics

Descriptive statistics appear in Table 1. Means fell within one standard deviation of past studies of undergraduates (e.g., Gros et al., 2012; McGrath et al., 2012). Bivariate correlations show all indicators of self-critical perfectionism were correlated and all indicators of social anxiety were correlated. All indicators of self-critical perfectionism (at each wave) were correlated with all indicators of social anxiety (at each wave). Test-retest reliabilities were good, ranging from .66 to .74 for self-critical perfectionism and from .68 to .85 for social anxiety.

Table 1
Means, standard deviations, alphas, and bivariate correlations.

Manifest variables	M	SD	α	Wave 1						Wave 2						Wave 3					
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Wave 1																					
1. Self-criticism (DEQ)	19.32	7.42	.86	–	.60	.63	.47	.38	.45	.71	.46	.52	.46	.32	.35	.66	.52	.56	.45	.37	.41
2. COM (FMPS)	11.01	4.87	.86	–		.61	.46	.44	.42	.58	.71	.49	.47	.36	.35	.47	.68	.56	.45	.41	.37
3. DAA (FMPS)	9.77	4.34	.87	–			.58	.50	.50	.57	.47	.69	.60	.43	.50	.48	.49	.69	.51	.45	.44
4. Social anxiety (SIAS)	22.39	14.38	.93	–				.68	.69	.45	.44	.45	.84	.55	.60	.39	.40	.50	.81	.59	.55
5. Social anxiety (SPS)	12.51	11.65	.92	–					.69	.37	.44	.40	.59	.73	.61	.34	.38	.47	.52	.74	.46
6. Social anxiety (LSAS-A)	15.15	11.01	.91	–						.40	.46	.44	.61	.55	.70	.42	.42	.47	.62	.60	.68
Wave 2																					
7. Self-criticism (DEQ)	19.43	7.61	.86	–							.63	.68	.53	.40	.41	.72	.59	.59	.46	.36	.40
8. COM (FMPS)	10.80	4.88	.87	–								.66	.53	.47	.44	.51	.73	.58	.50	.44	.38
9. DAA (FMPS)	9.44	4.28	.87	–									.58	.47	.47	.54	.56	.74	.53	.45	.43
10. Social anxiety (SIAS)	23.00	14.46	.94	–										.69	.69	.50	.72	.57	.85	.64	.58
11. Social anxiety (SPS)	12.31	12.38	.94	–											.74	.34	.31	.44	.59	.81	.52
12. Social anxiety (LSAS-A)	12.16	11.40	.93	–												.43	.37	.47	.66	.69	.70
Wave 3																					
13. Self-criticism (DEQ)	18.36	7.30	.85	–													.61	.63	.56	.47	.51
14. COM (FMPS)	10.34	4.74	.88	–														.65	.47	.39	.44
15. DAA (FMPS)	8.92	4.25	.86	–															.54	.52	.50
16. Social anxiety (SIAS)	23.16	14.63	.94	–																.70	.70
17. Social anxiety (SPS)	12.41	12.42	.94	–																	.70
18. Social anxiety (LSAS-A)	11.37	11.44	.93	–																	–

Note: COM = concern over mistakes; DAA = doubts about actions. DEQ = Depressive Experiences Questionnaire; FMPS = Frost's Multidimensional Perfectionism Scale; SIAS = Social Interaction Anxiety Scale; SPS = Social Phobia Scale; LSAS-A = Avoidance subscale of the Liebowitz Social Anxiety Scale. Bolded numbers represent test-retest correlations. All bivariate correlations are significant at $p < .001$.

3.3. Model testing

Factor loadings for corresponding manifest indicators of each latent variable and for equivalent paths were constrained to equality over time. We compared the constrained and the unconstrained model and found a CFI change of .002 and a non-significant χ^2 difference test, suggesting the models are statistically equivalent and using equality constraints is empirically justified (Cheung & Rensvold, 2002). Cross-wave correlated errors (e.g., the error term for self-critical perfectionism at Wave 2 correlated with the error term for self-critical perfectionism at Wave 3) were specified a priori.

Our measurement model involved six latent variables (i.e., self-critical perfectionism at three waves and social anxiety at three waves). Each latent variable was comprised of three manifest variables (e.g., the social anxiety latent variable at Wave 1 included the SIAS, SPS, and LSAS at Wave 1). Manifest variables had to load onto corresponding latent variables. CFA showed the measurement model fit the data well: $\chi^2(122, N = 301) = 197.40, p < .001; \chi^2/df = 1.62; CFI = .98; RMSEA = .05$ (90% CI: .03, .06). And all standardized factor loadings were significant ($p < .001$), ranging from .76 to .77 for self-criticism; .76–.78 for concern over mistakes; .84–.85 for doubts about actions; .84–.85 for the SIAS; .82–.85 for the SPS; and .82–.85 for the LSAS-avoidance. These results suggest latent variables of the reciprocal relations model are well measured by their manifest indicators.

Autoregressive paths tested inter-individual stability and cross-lagged paths tested if a change in one variable (e.g., Wave 2 self-critical perfectionism) contributed to a change in another (e.g., Wave 3 social anxiety). The reciprocal relations model (see Fig. 1) fit the data well: $\chi^2(120, N = 301) = 207.69, p < .001; \chi^2/df = 1.73; CFI = .97; RMSEA = .05$ (90% CI: .04, .06). As hypothesized, autoregressive paths for self-critical perfectionism and social anxiety were significant, suggesting these variables are temporally stable. Cross-lagged paths from social anxiety to self-critical perfectionism were significant; contrary to hypotheses, cross-lagged paths from self-critical perfectionism to social anxiety were not significant.

4. Discussion

Our 12-month, three-wave longitudinal study was the first to test reciprocal relations between self-critical perfectionism and social anxiety. Autoregressive paths showed self-critical perfectionism and social anxiety displayed high rank-order inter-individual stability across waves. The reciprocal relations model was not supported. After accounting for the stability of the two constructs across waves, social anxiety predicted change in self-critical perfectionism (consistent with the complication model), although self-critical perfectionism did not predict change in social anxiety (contrary to the vulnerability model).

4.1. Stability

As hypothesized, autoregressive paths for self-critical perfectionism and social anxiety were highly stable in terms of rank-order inter-individual stability. This is consistent with the conceptualization of self-critical perfectionism as a stable personality trait. Our methods extend past research and provide uniquely important data on the stability of perfectionism. Most studies only have two waves (e.g., Mackinnon, Sherry, Pratt, & Smith, 2014), whereas we have three. Compared to past studies using shorter measurement intervals such as 1 week (e.g., McGrath et al., 2012), we used a 6-month time frame. As hypothesized, autoregressive paths were also highly stable for social anxiety. In fact, social anxiety exhibited comparable (even higher) rank-order stability than perfectionism. These results complement theory and research suggesting social anxiety is persistent (Gros et al., 2012). Our study extends past social anxiety research by using a 6-month time frame versus shorter time frames (e.g., 1 week; Gros et al., 2012).

4.2. Self-critical perfectionism and social anxiety

The reciprocal relations model was not supported. Instead, self-critical perfectionism was a complication of, but not a vulnerability for, social anxiety. Results supported the idea that people with

social anxiety develop perfectionistic tendencies such as excessive standards for performance, conditional beliefs concerning the consequences of less-than-perfect performance, and unconditional self-critical beliefs (Clark, 2005). Socially anxious individuals may use perfectionism to compensate for their fears – hiding behind a façade of perfection in an effort to fend off anticipated judgment from others (Hewitt et al., 2003). Our results contrast with findings that self-critical perfectionism and depression are reciprocally related (McGrath et al., 2012). Despite the strong relationship between social anxiety and depression (Ingram, Ramel, Chavira, & Scher, 2005), perfectionism may play a different role in social anxiety versus depression.

Our study is the first to test whether perfectionism confers vulnerability to social anxiety; therefore, our null findings should be interpreted cautiously. For example, our measurement intervals may have influenced our null findings. We used a 6-month measurement interval, which does not capture short-term relations between perfectionism and anxiety. A daily diary study using a day-to-day sampling strategy found that perfectionism conferred vulnerability to social anxiety (Mackinnon, Battista, et al., 2014). Furthermore, our sample was comprised mostly of young adults. It may be that perfectionism confers vulnerability for social anxiety in adolescence. But once both are present, social anxiety may complicate self-critical perfectionism in young adulthood and onward. By testing young adults, we may have missed the part of the vicious cycle where perfectionism contributes to social anxiety development. We also did not assess perfectionistic strivings or perfectionistic self-presentation (e.g., concealing perceived imperfections). Research suggests both these dimensions of perfectionism are related to social anxiety (e.g., Hewitt et al., 2003; Mackinnon, Battista, et al., 2014). Finally, the stability was strong for social anxiety, making it hard for self-critical perfectionism to exert an effect over and above the stability of social anxiety.

4.3. Clinical implications

Results suggest social anxiety complicates self-critical perfectionism in young adults. Clinicians assessing perfectionism are advised that scores on self-critical perfectionism measures may be influenced by previous levels of social anxiety. Our results also inform the treatment of perfectionism (albeit somewhat indirectly). The complication model views social anxiety as leading to the development of self-critical perfectionism. Therefore, a reduction in social anxiety may lead to a corresponding reduction in self-critical perfectionism. In fact, this has already been found in past treatment studies (Ashbaugh et al., 2007).

4.4. Limitations and future directions

Our sample was a relatively homogenous group of mostly Caucasian females with largely subclinical levels of social anxiety. This raises questions regarding the representativeness of our sample and the generalizability of our results. Future research should investigate other ethnic groups, males, and individuals with diagnosable levels of social anxiety. We also relied on self-report measures, which may be somewhat inaccurate due to participants' lack of insight or social desirability biases. Limitations of self-reports may be remedied with the use of informant reports, observational measures, or interview measures. As our study did not involve an experimental design, causality cannot be inferred from our results. Potential third variable explanations for our results should also be tested. For example, a higher-order personality trait such as neuroticism may represent a self-conscious form of negative emotionality that underlies both self-critical perfectionism and social anxiety and explains their interrelation.

4.5. Concluding remarks

Knowing whether self-critical perfectionism is a vulnerability for or a complication of social anxiety, or both is important to understanding the relationship between self-critical perfectionism and social anxiety. Our novel, 12-month, 3-wave longitudinal study indicates self-critical perfectionism is a complication of, but not a vulnerability for, social anxiety.

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