

The Fixed Mindset of Anxiety Predicts Future Distress: A Longitudinal Study

Hans S. Schroder

McLean Hospital and Michigan State University

Courtney P. Callahan

Allison E. Gornik

Jason S. Moser

Michigan State University

Mindsets, or beliefs about the malleability of self-attributes such as intelligence and personality, have been linked to a wide range of outcomes in educational and social psychology. There has been recent interest in exploring this construct in clinical psychological contexts. To that end, research has shown that the fixed mindset of anxiety—the belief that anxiety is fixed and unchangeable—is related to a variety of psychological distress symptoms, emotion regulation strategies, and treatment preferences. One outstanding question is whether the fixed mindset of anxiety predicts future psychological symptoms. To address this question, the current longitudinal study assessed weekly distress and anxiety mindset across 5 weeks. We found that fixed mindset of anxiety is predictive of future weekly distress, even after controlling for the previous week's distress, sex, socioeconomic status, baseline depression symptoms, and presence of psychiatric diagnosis. These findings add evidence to an emerging conceptual framework in which the fixed mindset of anxiety represents an important risk factor for the onset of future psychological problems.

Keywords: mindsets; growth mindset; implicit theories; anxiety; multilevel modeling

IMPLICIT THEORIES OR MINDSETS are beliefs about the malleability of self-attributes such as intelligence and

Address correspondence to Hans Schroder, Ph.D., McLean Hospital, Belmont, MA 02478; e-mail: hans.stuart.schroder@gmail.com

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personality (Dweck, 1999; Dweck, Chiu, & Hong, 1995). These beliefs lie along a continuum ranging from the growth mindset (or incremental theory; the belief that attributes are malleable) to the fixed mindset (or entity theory; the belief that attributes are immutable). Although most mindset studies have been conducted within the social and personality psychology field, increasing attention has been given to the role of mindsets in clinical psychology (e.g., Kneeland, Dovidio, Joormann, & Clark, 2016; Schleider, Abel, & Weisz, 2015).

Mindsets may be particularly related to mental health for a number of reasons. First, they are well-known predictors of different attributions, goals, and self-conceptions (Dweck & Leggett, 1988). For instance, individuals with more of a growth mindset tend to attribute failures to a lack of effort, tend to approach tasks with an eye toward developing mastery, and view themselves as a work in progress. In contrast, individuals with more of a fixed mindset tend to attribute failure to a lack of ability, approach tasks with the goal of outperforming others (rather than develop mastery of the task), and view their abilities as fixed and set in stone.

Second, two recent meta-analyses found that growth mindsets are negatively correlated with psychopathology (Schleider et al., 2015) and negative affect (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013). A number of correlational studies have found that fixed mindsets of emotion (Tamir, John, Srivastava, & Gross, 2007) and anxiety (Schroder, Dawood, Yalch, Donnellan, & Moser, 2015) are particularly related to psychological

distress. These findings indicate that mindsets may be relevant to clinical psychological applications (Kneeland et al., 2016). For instance, some have suggested that interventions that teach the growth mindset may reduce psychological distress (e.g., Kneeland et al., 2016; Miu & Yeager, 2015). Given the ease and dissemination capability of mindset interventions (e.g., Bergen, 1991; Chiu, Hong, & Dweck, 1997; Hong, Chiu, Dweck, Lin, & Wan, 1999), the use and incorporation of such protocols may be of interest to clinicians and policymakers (Kenthirajah & Walton, 2015; Yeager et al., 2014).

Although findings from such studies are promising, most of the studies linking mindsets and psychological distress have been cross-sectional (Schroder et al., 2015, 2016, 2017) and so have been unable to parse apart the temporal dynamics of the association between the anxiety mindset and psychological distress. This is an outstanding question in the literature because it may inform intervention efforts (see Miu & Yeager, 2015). For instance, do mindsets prospectively predict distress? We are aware of just one study that has addressed this question. Schleider and Weisz (2016) measured psychological distress and mindsets of thoughts, feelings, and behaviors in a sample of 59 adolescents (ages 11–14) at three time points across 9 months. They found that psychological distress prospectively predicted more fixed mindset endorsement, but, contrary to expectations, they did not find that fixed mindsets predicted future distress. These findings suggested that distress might precede mindsets, rather than the other way around.

However, some aspects of the Schleider and Weisz (2016) study should be considered before making any firm conclusions about whether mindsets predict future distress or vice versa. First, the mindsets the authors measured—mindsets of “thoughts, feelings, and behaviors”—had not been well established prior to their study. Although mindsets of emotions had been studied before (Tamir et al., 2007), we are unaware of previous studies examining mindsets of thoughts and behaviors. From a conceptual standpoint, thoughts and behaviors are much more transient in nature than personal attributes such as intelligence or personality; it is therefore not entirely clear that these domains would function similarly to other mindset domains about traitlike characteristics. Second, the mindset items were all incrementally oriented (e.g., “You control the feelings you have”), which is not recommended by mindset theorists (Chiu et al., 1997; Dweck, 1999; Levy, Stroessner, & Dweck, 1998), as respondents tend to acquiesce toward these sentiments. Indeed, the majority of mindset studies (e.g., Chiu et al., 1997; Hong et al., 1999; Valentiner, Jencius, Jarek, Gier-Lonsway, &

McGrath, 2013) use items keyed in the fixed direction to avoid this problem. Third, the sample size of 59 was likely too small to detect reliable effects of individual predictors in the type of multiple regression analyses used (e.g., Tabachnick & Fidell, 2013). Taken together, these measurement characteristics make it difficult to compare the results of the Schleider and Weisz (2016) study with other mindset studies and draw firm conclusions about temporal associations between mindsets and distress.

With this in mind, it is important to understand how mindsets and distress covary over time using more well-established mindset measures. To this end, we sought to examine this question using the anxiety mindset measure, which has been validated in previous cross-sectional studies. Specifically, the anxiety mindset scale—which measures beliefs about the malleability of anxiety—has been shown to be psychometrically distinct from other mindsets of emotion, intelligence, and personality using both exploratory (Schroder et al., 2015) and confirmatory (Schroder et al., 2016) factor analytic approaches. It has also been shown to be related to a number of psychological symptoms, including anxiety, depression, perfectionism, and interpersonal problems (Schroder et al., 2015; Schroder et al., 2017) and borderline personality traits (Yalch, Schroder, Dawood, & Donnellan, 2017). An emerging model from this work suggests that the growth mindset of anxiety leads to more adaptive emotion regulation strategies and, ultimately, greater psychological health. That is, the growth mindset is hypothesized to predict subsequent psychological health, whereas the fixed mindset is expected to predict future psychological distress. Understanding the nature of the temporal association between the anxiety mindset and subsequent distress is an important step in evaluating this emerging model. If a fixed mindset of anxiety were to predict future distress, it may suggest that this belief is a risk factor for subsequent psychological problems. This would underscore the importance of assessing beliefs about the changeability of anxiety and may signal the need for interventions even before anxiety or depression are present.

Here, we examined the covariation between anxiety mindset and distress on a week-to-week basis across 5 weeks among college students. As described below in the Method section, we operationalized weekly distress as a composite of worry, anxiety, loneliness, depression, and anger items from a well-validated measure of college adjustment. We used multilevel modeling to test whether mindsets prospectively predict weekly distress. The hypothesis was that the fixed mindset of anxiety would predict subsequent weekly distress. We controlled for

symptoms of depression—which also predicts subsequent distress (e.g., Jacobson & Newman, 2017; Nolen-Hoeksema, Girgus, & Seligman, 1986)—using a well-validated measure at the baseline assessment. We also controlled for several potentially confounding variables, including socioeconomic status, age, sex, and psychiatric diagnosis history.

Method

PARTICIPANTS

Participants were undergraduate freshmen at a large Midwestern university who were drawn from the Department Subject Pool. A total of 293 respondents completed the online survey, which was done in exchange for credit towards a course requirement. The sample (M age = 18.07 years, SD = 0.33) was primarily female (80.6% female, 18.5% male, and 0.9% missing sex data), and, although we did not collect information about race or ethnic identity, the self-reported native language was predominantly (98%) English. The university's Institutional Review Board approved all study procedures and all participants provided consent.

All participants involved in this study were first-semester freshmen. We chose to focus on freshmen because they are experiencing a period of transition. According to Tamir et al. (2007), times of transition tend to bring out preexisting knowledge and beliefs that guide individuals' perceptions and responses to their environment. Participants enrolled for a baseline questionnaire session and then were contacted once per week for 4 subsequent weeks to complete additional questionnaires.

WEEKLY MEASURES

The *Implicit Theories of Anxiety* (TOA; Schroder et al., 2015) scale is a four-item measure of the anxiety mindset. Participants rate fixed-minded statements (e.g., “No matter how hard you try, you really can't change the level of anxiety that you have”) on a scale of 1 (*strongly disagree*) to 6 (*strongly agree*). As convention in the mindset literature, items are reverse scored such that higher scores on the TOA are associated with more endorsement of the growth mindset, and lower scores on the TOA correspond to more fixed-mindedness about anxiety.

The *College Adjustment Test* (Pennebaker, 2013; Pennebaker, Colder, & Sharp, 1990) is a 19-item questionnaire assessing a number of different emotions and experiences associated with college. Participants use a scale from 1 (*not at all*) to 7 (*a great deal*) to rate the degree to which they experienced the statements over the previous week. There are three subscales: Positive Affect (e.g., “Liked your classes”), Negative Affect (e.g.,

“Felt anxious or nervous”), and Home Sickness (e.g., “Missed your friends from high school”). For this study, we used the nine-item Negative Affect scale to assess weekly distress. The Negative Affect scale consists of the following items: “Worried about how you will perform academically in college,” “Worried about love or intimate relationships with others,” “Worried about the way you look,” “Worried about the impressions you make on others,” “Worried about college in general,” “Felt angry,” “Felt lonely,” “Felt anxious or nervous,” and “Felt depressed.”

Control Variables

The *Patient Health Questionnaire-9* (PHQ-9; Kroenke, Spitzer, & Williams, 2001) is a nine-item measure of depressive symptoms. The PHQ-9 was measured at the baseline assessment. Participants use a scale of 0 (*not at all*) to 3 (*nearly every day*) to rate various depression symptoms (e.g., “Feeling down, depressed, or hopeless”) over the last 2 weeks. The PHQ-9 is well-validated in previous research, including studies with college students (Eisenberg, Gollust, Golberstein, & Hefner, 2007).

A number of covariates, including sex, socioeconomic status (self-reported parental income and dependence on parents' finances), and self-reported presence of psychiatric diagnosis (“Have you ever received a psychiatric diagnosis?”) were collected and included in the analyses. Overall, 26.3% of the sample reported a history of psychiatric diagnosis.

Results

CORRELATIONS AND DESCRIPTIVE STATISTICS

Means, standard deviations, internal reliability, and bivariate correlations of baseline depression as well as weekly mindset and distress are presented in Table 1. As expected, endorsement of the growth mindset was negatively correlated with depression symptoms and weekly distress at all five time points. Also, as expected, baseline depression was positively correlated with weekly distress. Anxiety mindset was moderately stable throughout the study period, with correlations ranging from .49 to .72. These correlations highlight the fact that while the measure is relatively stable, there is also change over time. Similarly, intraclass correlation coefficients revealed similar room for growth (distress = .69, mindset = .62), and we capitalized on this intraindividual change through multilevel analyses.

PREDICTING CHANGE IN DISTRESS OVER TIME

We tested whether an individual's prior week mindset predicted subsequent levels of distress

Table 1
Descriptive Statistics and Bivariate Correlations Between Study Variables

	PHQ-9	TOA T1	TOA T2	TOA T3	TOA T4	TOA T5	Distress T1	Distress T2	Distress T3	Distress T4	Distress T5
Mean	6.75	4.26	4.30	4.43	4.50	4.45	4.46	4.11	3.92	3.73	4.01
SD	5.51	1.40	1.27	1.22	1.16	1.28	1.28	1.28	1.24	1.27	1.31
PHQ-9	(.87)										
TOA T1	-.49	(.95)									
TOA T2	-.34	.63	(.96)								
TOA T3	-.36	.61	.72	(.96)							
TOA T4	-.31	.52	.66	.70	(.96)						
TOA T5	-.23	.53	.63	.71	.72	(.97)					
Distress T1	.65	-.48	-.45	-.37	-.37	-.34	(.87)				
Distress T2	.56	-.41	-.51	-.38	-.31	-.37	.74	(.89)			
Distress T3	.52	-.43	-.49	-.45	-.36	-.39	.70	.72	(.89)		
Distress T4	.39	-.40	-.48	-.41	-.35	-.41	.68	.70	.81	(.89)	
Distress T5	.48	-.37	-.42	-.39	-.33	-.42	.70	.71	.74	.79	(.88)

Note. Ns range from 211 to 287. Cronbach's alpha is listed on the diagonal in parentheses. PHQ-9: Patient Health Questionnaire; TOA: Theories of Anxiety (higher scores indicate greater growth mindset endorsement). Distress: Negative Affect scale from the College Adjustment Test. All correlations are significant at $p < .01$.

using multilevel modeling in HLM 7.0 with full information maximum likelihood estimation and robust standard errors. First, we estimated the best-fitting trajectory of time-related change in distress, and subsequently entered lagged mindset variables as a level one predictor to represent mindset at the prior wave of assessment. We also included lagged distress variables as a predictor in all models to test whether distress predicted change in mindset from one measurement time to the next. In this way, we could test if prior mindset scores were predictive of distress above and beyond the effect of distress over time as well as distress at the prior measurement period. Two levels were included in each model to nest the five waves within individuals. Within-subject effects were analyzed at level one, and the variance components were estimated at the intercept and linear slope to allow individuals to vary on their initial level of distress as well as the linear change in distress.

Time-related linear change in distress was determined through comparing the unconditional means model to unconditional growth models. While the means model is solely comprised of an intercept term, the growth model includes both the intercept term as well as a slope parameter. We tested for the presence of significant nonlinear effects through examining quadratic and cubic wave terms as fixed effects. After determining the best-fitting trajectory for time-related change in distress, we added the effect of lagged mindset (i.e., individuals' mindset score at the prior wave) and lagged distress (to control for the prior measurement of distress), followed by a series of covariates. Change models were compared using AIC statistics, where a lower AIC indicated a better-fitting model.

The shape of distress was best modeled through a significant quadratic trajectory, representing a decrease from average baseline distress followed by a slight leveling-out increase. In addition, the effect of the prior week's mindset contributed significantly to subsequent distress, $p < .001$, with higher mindset scores (indicating a growth-oriented rather than fixed mindset) predicting lower levels of subsequent distress. Table 2 presents model-building steps and fit statistics, and see Figure 1 for the trajectory of distress separated by mindset scores at one standard deviation above and below the mean for each lagged time point.

An important consideration is whether the effect of prior-week mindset continued to predict subsequent week distress above and beyond baseline ratings of the depression measure. When Time-1 PHQ-9 scores were entered as a level-2 predictor, lagged mindset scores continued to emerge as a significant predictor of subsequent distress. The magnitude of prior-week mindset on subsequent distress can be interpreted in standard deviation units, indicating that a prior week's growth mindset predicted less subsequent distress at an average of -0.07 SD, or when considered over the total 5 weeks, -0.35 SD. Finally, PHQ-9 scores contributed significantly to the resulting model, indicating that higher levels of baseline depression concerns contributed to higher levels of initial distress, while higher mindset scores continued to predict lower levels of subsequent distress above and beyond the effect of average time-related quadratic change.

Other potentially important covariates were also examined, including sex, age, parent and participant income, and history of psychiatric diagnosis (categorized as yes/no). Each was added to the

Table 2
Model Building for Models Predicting Distress

	Intercept Coeff (SE)	Wave Coeff (SE)	Wave ² Coeff (SE)	Previous Week Distress (SE)	Previous Week Mindset (SE)	PHQ-9	AIC (# of est. parameters)	Level-1 Variance Component
Distress (outcome)	4.10 (.07)***						3238.37 (3)	.5141
Distress (linear)	4.44 (.08)***	-.12 (.02)***					3165.87 (6)	.4358
Distress (quadratic)	5.00 (.12)***	-.62 (.07)***	.08 (.01)***				3113.60 (7)	.4032
Distress w/ lagged distress	1.08 (.40)**	-.33 (.22)	.06 (.03)*	.77 (.03)***			2122.68 (8)	.6858
Distress, lagged distress, and prior week mindset	1.66 (.43)***	-.34 (.22)	.07 (.03)*	.73 (.03)***	-.09 (.03)***		2112.2 (9)	.6758
with PHQ-9 on intercept	1.70 (.43)***	-.37 (.22)†	.07 (.03)*	.68 (.04)***	-.07 (.03)**	.02 (.01)***	2100.84 (10)	.6652

Note. PHQ-9: Patient Health Questionnaire-9 (measure of depression). AIC: Akaike Information Criterion.
† $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$. Variance estimated at the intercept and linear slope.

model along with time-related change, prior-week distress, and prior-week mindset, and was evaluated with and without the PHQ-9 scores entered as an additional covariate. None of these covariates contributed significantly to the prediction of distress, and none reduced the lagged mindset score to a nonsignificant predictor.

Discussion

This study was designed to assess temporal associations between the anxiety mindset and distress using a longitudinal design across 5 weeks. It was intended to extend previous research on the anxiety mindset, which has been cross-sectional in nature (Schroder

et al., 2015, 2016, 2017; Yalch et al., 2017; see Howell, 2017, for a review). We tested whether fixed mindsets would predict subsequent distress. We also controlled for a number of important covariates including sex, socioeconomic status, self-reported presence of a psychiatric diagnosis, depression symptoms, and previous week distress. We found that weekly fixed mindset of anxiety did indeed predict more psychological distress in the next week, even after controlling for these covariates. Over the 5 sequential weeks where students' distress and mindset were assessed, students with more of a growth mindset were predicted to have approximately a third of a standard deviation less distress over time.

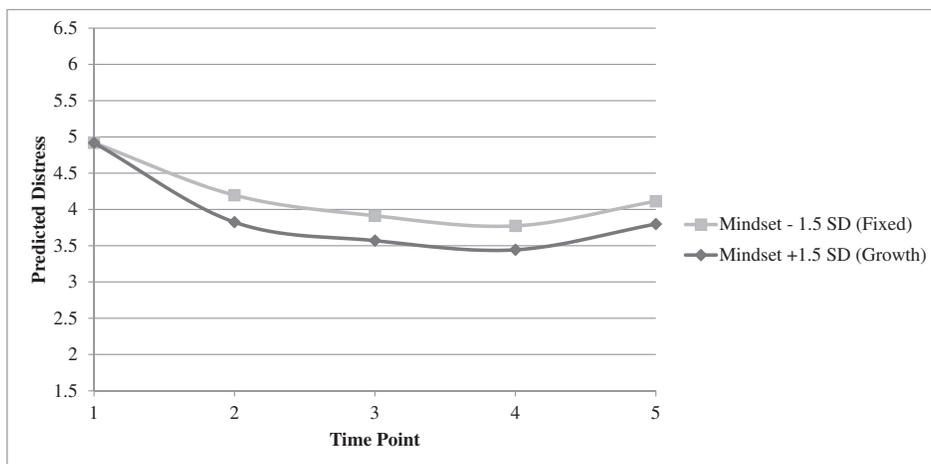


FIGURE 1 Predicting Distress over Time with Trajectories +/- 1SD for Prior Week Mindset
Note. Lagged mindset and lagged distress are included in this model to predict subsequent distress. The predicted distress score axis is comprised of +/- 2 standard deviations from the grand mean.

Together, these findings provide evidence that the fixed mindset of anxiety may be predictive of psychological distress. Here, we discuss a few implications of the present work in the context of mindset theory and data.

The current findings add to the literature on the anxiety mindset, which, as noted above, has been cross-sectional in nature. The finding that the anxiety mindset is predictive of subsequent distress adds to its construct validity. Previous research has established that this mindset is different from other mindsets of intelligence, personality, and emotion (Schroder et al., 2015, 2016), that it correlates with a wide range of psychological distress measures, and that it is linked with preferences for mental health treatment (Schroder et al., 2015). Specifically, Schroder et al. (2015) found that a growth mindset of anxiety predicted students' preference for psychological therapy versus medication when considering a hypothetical treatment scenario. There is more recent evidence that the growth mindset buffers the association between stressful life events and psychological symptoms (Schroder et al., 2017) and negatively predicts borderline personality symptoms over and above maladaptive personality traits (Yalch et al., 2017). Other research examining the related construct of expectancy for anxiety change found that individuals with high expectancy for change showed greater improvements in cognitive-behavioral therapy (Westra, Dozois, & Marcus, 2007). Together with these previous results, the current findings add to the growing nomological net of the anxiety mindset construct by showing that the anxiety mindset is predictive of subsequent psychological outcomes. The evidence to date suggests this is a worthy construct for further attention by researchers interested in clinical psychology and mental health.

We are aware of just one other study examining mindsets and psychological distress in a longitudinal framework (Schleider & Weisz, 2016). These authors did not find that fixed mindsets predicted subsequent psychological symptoms. However, this study differed from ours in a number of ways; first, their sample was made up of young adolescents whereas ours was of college students; second, as mentioned above, the mindsets in that study may have not been ideally measured; and third, that study used a longer time scale (9 months) than the one used here (5 weeks). It is therefore difficult to directly compare the results of our study with those of Schleider and Weisz. Nonetheless, it is possible that developmental changes influence the nature of the temporal relationship between mindsets and distress. For instance, perhaps distress in 1 week is more influential on changes in beliefs for adolescents,

whereas the reverse may be true for young adults, whose beliefs may be more stable. It is also possible that the anxiety mindset predicts distress on a week-to-week basis, but no longer predicts distress over longer periods of time. Future research will need to test these possibilities.

LIMITATIONS AND FUTURE DIRECTIONS

There are a number of limitations that need to be addressed in future studies. First, the sample was composed of college students, and future studies need to assess whether these findings generalize to community and treatment-seeking samples. Second, although we used a powerful statistical technique in multilevel modeling, our study period lasted only 5 weeks. It is unclear if the effects uncovered here will persist longer than 5 weeks and future studies will need to assess mindsets and distress over a longer period of time.

We should note that our study did not assess causality of the anxiety mindset. That is, because we did not experimentally manipulate mindsets, we are unable to claim that the fixed mindset of anxiety is causally related to future distress. An anxiety mindset induction is necessary to determine causality, and we believe this is a logical next step in terms of future directions. Previous research has demonstrated that the anxiety mindset is a potentially useful construct in that it correlates with a number of psychological outcomes. The current findings reveal that a fixed mindset of anxiety may be a risk factor that precedes the onset of distress. As such, early identification of the fixed mindset of anxiety may be important to stem the tide of subsequent distress and psychological problems. Thus, this mindset may be an interesting treatment target. An intervention designed to induce this belief may confer benefits such as increased motivation to engage in treatment and higher expectancies for treatment success. Interventions in other mindset domains have successfully induced beliefs of intelligence (Hong et al., 1999), personality (Miu & Yeager, 2015), emotion (Kneeland et al., 2016), and many others (see Burnette et al., 2013 for a meta-analysis and review). An intervention designed to induce the growth mindset of anxiety may include information about how anxiety impacts the brain, but that the brain is changeable, much like interventions promoting the growth mindset of personality (Miu & Yeager, 2015).

A second future direction would be to assess how the anxiety mindset influences treatment response among treatment-seeking individuals. We would predict that individuals entering therapy with a growth mindset of anxiety would reap more benefit from the process than individuals with more of a fixed mindset. Third, it will be important to

establish temporal relations among different types of mindsets and distress symptoms. Previous studies (Schroder et al., 2015, 2016) have found that mindsets are domain-specific; the anxiety mindset seems to be most relevant for mental health symptoms, whereas mindsets of intelligence and personality are less predictive of symptoms. In this study, we examined how mindsets of anxiety predict distress. Relatedly, more research is needed on the construct validity of the anxiety mindset. Specifically, further understanding the overlap between the anxiety mindset and related constructs of motivation and appraisals of emotions is needed. Schroder et al. (2015) found that the anxiety mindset was weakly correlated ($r = .05$) with the Change Questionnaire (Miller & Johnson, 2008), a measure of multiple motivations to change a specific behavior or tendency. Although this research suggests the anxiety mindset is distinct from other seemingly related constructs, further work is needed to verify this. Finally, the effects uncovered here were rather small. However, this is common for mindset research (Burnette et al., 2013; Sisk, Burgoyne, Sun, Butler, & Macnamara, 2018) as there are often other variables that mediate or moderate relations between mindsets and outcomes. The effects were unlikely to be driven by artificial attenuation from low reliability—indeed, the measures here had quite high internal reliability (alphas $> .86$, see Table 1). Rather, it is likely that the effect sizes are truly modest and future research will be needed to understand mediating and moderating processes linking mindset of anxiety to subsequent distress.

In conclusion, we found that one's fixed mindset about anxiety is predictive of subsequent distress, even when controlling for baseline symptoms of depression, previous-week distress, and a number of important covariates. The current results support the idea that the fixed mindset of anxiety is a risk factor for subsequent psychological problems. This is a novel finding and suggests that identifying a fixed mindset of anxiety—even before the onset of depression and anxiety—may be important for intervention efforts. We look forward to more studies examining this interesting construct in order to help individuals with psychological distress.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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