



Short Communication

Growth mindset of anxiety buffers the link between stressful life events and psychological distress and coping strategies



Hans S. Schroder^{a,*}, Matthew M. Yalch^{a,b}, Sindes Dawood^c, Courtney P. Callahan^a,
M. Brent Donnellan^d, Jason S. Moser^a

^a Michigan State University, United States

^b San Francisco Veterans Affairs Health Care System, United States

^c The Pennsylvania State University, United States

^d Texas A&M University, United States

ARTICLE INFO

Article history:

Received 19 July 2016

Received in revised form 17 November 2016

Accepted 11 January 2017

Available online xxxx

Keywords:

Growth mindset

Anxiety mindset

Stressful life events

Potentially traumatic events

Coping

Resilience

ABSTRACT

Beliefs about the malleability of global attributes like personality and intelligence – known as mindsets – are well-established predictors of resilience to challenges in educational contexts. Recent research further suggests that mindsets about anxiety may act in a similar fashion with mental health resilience. In this study we examined whether anxiety mindset would moderate relations between history of stressful life events and psychological distress and coping. Consistent with predictions, relations between number of stressful life events and posttraumatic stress symptoms, depression, substance use, and motivations for non-suicidal self-injury were weaker among those with more of a growth mindset relative to those with more of a fixed mindset. These initial results suggest that anxiety mindsets function in a similar way for mental health resilience as how mindsets of intelligence function for academic outcomes.

© 2017 Published by Elsevier Ltd.

1. Introduction

Mindsets refer to implicit beliefs about the malleability of personal attributes (Dweck, 1999). The growth mindset is the belief that an attribute like intelligence or personality is changeable; the fixed mindset is the belief that such attributes are immutable. Research in social and educational psychology indicates that mindsets shape meaning-making processes and give rise to different goals, motivations, and behaviors (Dweck, Chiu, & Hong, 1995). Mindsets often determine responses to challenges and setbacks: students with a growth mindset of intelligence tend to adjust more adaptively after failure, whereas those with a fixed mindset of intelligence tend to disengage and feel helpless (Dweck & Leggett, 1988). Moreover, students with a growth mindset are better able to adjust to difficult academic transitions compared to those with a fixed mindset (Yeager et al., 2014). In fact, mindsets are more relevant during contexts that are challenging and have a less noticeable impact on behavior when tasks are easier (Dweck & Leggett, 1988). In this way, mindsets can be said to moderate the link between challenge level and subsequent performance/adjustment: among individuals with fixed mindsets, higher difficulty corresponds with poorer

performance and adjustment, whereas this association is weaker among growth-minded individuals.

The general finding that a growth mindset buffers the negative consequences of challenging and demanding environments has implications for clinical psychology, given that stressful life circumstances are risk factors for developing psychological distress (Abramson, Seligman, & Teasdale, 1978; Infurna & Luthar, 2016). Although the application of mindsets to clinical science is in its infancy (Kneeland, Dovidio, Joormann, & Clark, 2016), three promising findings have emerged. First, connections between mindsets and mental health symptoms are somewhat domain-specific, such that correlations with symptoms are stronger for mindsets of emotion and anxiety, compared to mindsets of personality and intelligence (Schroder, Dawood, Yalch, Donnellan, & Moser, 2015, 2016). Second, growth mindsets of emotions and anxiety are associated with adaptive emotion-regulation strategies such as cognitive reappraisal (De Castella et al., 2013; Kneeland et al., 2016). Third, the growth mindset of anxiety is associated with greater motivation to engage and succeed in psychological therapy (De Castella et al., 2015; Schroder et al., 2015; Valentiner, Jencius, Jarek, Gier-Lonsway, & McGrath, 2013).

Although such findings are suggestive, it remains unclear whether the anxiety mindset moderates the association between life challenges and adjustment. The current study was designed to test this hypothesis, using history of stressful life events (SLEs) as a proxy for challenge, and a

* Corresponding author at: 316 Physics Rd, Room 69E, Department of Psychology, Michigan State University, East Lansing, MI 48823, United States.

E-mail address: hans.stuart.schroder@gmail.com (H.S. Schroder).

set of psychological symptoms (posttraumatic stress disorder and depression symptoms) and maladaptive coping strategies (alcohol abuse, drug use, and motivations for non-suicidal self-injury) as indicators of adjustment. Although most people directly experience at least one SLE (Norris, 1992), repeated exposure to SLEs is associated with these and other adverse outcomes (Infurna & Luthar, 2016; Kendler, Karkowski, & Prescott, 1999; Nock, 2010). The primary hypothesis was that the relation between SLEs and distress/adjustment would be stronger among individuals with more of a fixed mindset of anxiety compared to those with more of a growth mindset of anxiety.

2. Method

2.1. Participants

Undergraduates ($N = 1682$) from a large Midwestern university participated for partial course credit¹, and 1254 were retained after screening for inattention ($M_{age} = 19.83$ years, range 18–33; 69.5% female, 73.4% Caucasian). The university's Institutional Review Board approved all procedures and all participants provided consent.

3. Measures

3.1. Anxiety mindset

The *Implicit Theories of Anxiety Scale* (TOA; Schroder et al., 2015) assessed mindset of anxiety. Four fixed-minded items (“You have a certain amount of anxiety and you really cannot do much to change it”, “Your anxiety is something about you that you cannot change very much”, “To be honest, you cannot really change how anxious you are”, and “No matter how hard you try, you can't really change the level of anxiety that you have”) are rated on a scale of 1 (Strongly Disagree) to 6 (Strongly Agree). The TOA has been shown to have acceptable reliability and validity in previous research (Schroder et al., 2015, 2016). Items are reverse-scored and then averaged such that higher scores reflect greater endorsement of the growth mindset of anxiety.

3.2. Stressful life events

The *Life Events Checklist-5* (LEC-5; Gray, Litz, Hsu, & Lombardo, 2004) is a widely used checklist of SLEs across the lifespan. The LEC-5 consists of 17 items and participants indicate their experience of each of the events using the following response options: “Happened to me”, “Witnessed”, “Learned About”, “Not Sure”, and “Not Applicable”. For this study, only the “Happened to me” responses were summed to create an index of history of SLEs.

3.3. Psychological distress

The *Posttraumatic Checklist for DSM-5* (PCL-5; Blevins, Weathers, Davis, Witte, & Domino, 2015) is a 20-item self-report measure of DSM-5 symptoms of PTSD experienced during the past month. The *Patient Health Questionnaire – 9* (PHQ-9; Kroenke, Spitzer, & Williams, 2001) is a 9-item measure of depression.

3.4. Maladaptive coping

Alcohol abuse in the past 30 days was measured with items from the *Patient Reported Outcome Measurement System Alcohol Use Short Form* (PROMIS-Alc; Pilkonis et al., 2013), and data were available from 794 respondents who had a drink during this time frame. The *Drug Abuse*

Table 1

Frequency of stressful life events endorsed on the *Life Events Checklist-5*.

EEEventD description	N	%
Natural disaster	215	17.23
Fire or explosion	70	5.61
Transportation accident	557	44.63
Serious accident at work, home, or during recreational activity	178	14.26
Exposure to toxic substance	60	4.81
Physical assault	245	19.63
Assault with weapon	30	2.40
Sexual assault	107	8.57
Other unwanted or uncomfortable sexual experience	309	24.76
Combat or exposure to a war-zone	11	0.88
Captivity	7	0.56
Life-threatening illness or injury	85	6.81
Severe human suffering	34	2.72
Sudden, violent death	42	3.37
Sudden, unexpected death of someone close to you	381	30.53
Serious injury, harm, or death you caused to someone else	37	2.96
Any other very stressful event or experience	553	44.31

Note. Values represent the number of “Happened to me” responses participants endorsed on the LEC-5. Participants were allowed to endorse multiple events.

Screening Test-10 (DAST-10; Skinner, 1982) is a 10-item (Yes/No) self-report measure used to screen for drug abuse problems. The 39-item *Inventory of Statements About Self-Injury* (ISAS; Klonsky & Glenn, 2009) assesses 13 functions for engaging in non-suicidal self-injury (e.g., affect regulation, self-punishment, sensation seeking).

3.5. Control variable – negative temperament

As research consistently underscores the influence of trait negative affectivity on mental health outcomes (Lahey, 2009), we controlled for negative temperament using the *Negative Temperament subscale of the Schedule for Nonadaptive and Adaptive Personality* (SNAP-NT; Clark, 1993) in additional analyses.

3.6. Data collection and analysis

Data collection took place over two consecutive semesters (first semester $N = 1026$; second semester $N = 229$) using slightly different surveys. The PROMIS-Alc, DAST-10, ISAS, SNAP-NT were only collected during the first and larger survey and Ns differ across analyses. Correlations were computed to quantify relations between study variables. We next used the simple moderation model from the PROCESS macro for SPSS (Hayes, 2013) to test the primary moderation hypothesis². In each of five models (one model per outcome variable), number of SLEs endorsed on the LEC-5 was specified as the predictor and TOA as the moderator variable. LEC-5 and TOA scores were mean-centered prior to analysis.

4. Results

Endorsement rates of SLEs are listed in Table 1. The average number of SLEs was 2.34 ($SD = 1.97$; range 0–11). Table 2 presents descriptive statistics and bivariate correlations. Number of SLEs was positively related to all outcomes except for alcohol abuse. Consistent with previous studies (Schroder et al., 2015, 2016), the growth mindset of anxiety was negatively correlated with all other variables.

Results of the moderation analyses are presented in Table 3. The anxiety mindset predicted each of the five outcomes, over and above the number of SLEs. The interaction between LEC-5 and TOA was statistically significant for PTSD symptoms, depression symptoms, drug abuse, and non-suicidal self-injury functions, although it was not statistically significant for alcohol abuse. In each case, for individuals with

¹ Data from some of these participants are reported in other published and in preparation papers (citations available in unmasked copy). However, these other papers examined different research questions with different variables and thus all of the analyses reported here are novel.

² As noted by a reviewer, the PROCESS macro uses listwise deletion; results were identical when regression models were computed using pairwise deletion.

Table 2
Descriptive statistics and bivariate correlations between variables.

Variable	M	SD	LEC-5	TOA	PCL-5	PHQ-9	DAST-10	PROMIS	ISAS	SNAP-NT
LEC-5	2.34	1.97	–							
TOA	4.12	1.36	–0.16**	(0.96)						
PCL-5	18.33	17.10	0.33**	–0.40**	(0.96)					
PHQ-9	6.68	5.58	0.23**	–0.42**	0.58**	(0.89)				
DAST-10	0.11	0.15	0.17**	–0.15**	0.20**	0.23**	(0.71)			
PROMIS	13.51	5.68	0.07	–0.13**	0.26**	0.24**	0.33**	(0.91)		
ISAS	4.15	9.18	0.13**	–0.19**	0.34**	0.40**	0.16**	0.16**	(0.96)	
SNAP-NT	3.04	1.05	0.15**	–0.42**	0.36**	0.43**	0.13**	0.09*	0.22**	(0.73)

Note. Cronbach's alpha is listed in parentheses along the diagonal. Ns for all correlations except PROMIS range from 965 to 1253; Ns for PROMIS range from 755 to 795.

* $p < 0.05$.

** $p < 0.01$.

Table 3
Results of the moderation analyses.

	Overall model								Simple slopes				
	N	R ²	ΔR ²	β	b	SE	Lower 95% CI	Upper 95% CI	1 SD below TOA		1 SD above TOA		
									b	SE	b	SE	
PTSD Symptoms (PCL-5)	1246	0.24**											
LEC-5				0.27**	2.37**	0.22	1.94	2.80	2.98**	0.29	1.76**	0.31	
TOA				–0.34**	–4.31**	0.32	–4.94	–3.69					
LEC-5_x_TOA			0.01**	–0.08**	–0.45**	0.15	–0.74	–0.16					
Depression Symptoms (PHQ-9)	1250	0.21**											
LEC-5				0.16**	0.45**	0.07	0.31	0.60	0.63**	0.09	0.28**	0.10	
TOA				–0.39**	–1.60**	0.11	–1.81	–1.39					
LEC-5_x_TOA			0.005**	–0.07**	–0.13**	0.05	–0.23	–0.03					
Drug Abuse (DAST)	1022	0.06**											
LEC-5				0.14**	0.11**	0.02	0.06	0.15	0.19**	0.03	0.03	0.03	
TOA				–0.11**	–0.12**	0.03	–0.19	–0.06					
LEC-5_x_TOA			0.01**	–0.12**	–0.06**	0.02	–0.09	–0.03					
Alcohol Abuse (PROMIS)	793	0.02**											
LEC-5				0.05	0.13	0.10	–0.06	0.33	0.26 ^a	0.13	0.01	0.14	
TOA				–0.12**	–0.50**	0.15	–0.80	–0.21					
LEC-5_x_TOA			0.002	–0.05	–0.09	0.07	–0.23	0.04					
Motivations for Self-Injury (ISAS)	999	0.05**											
LEC-5				0.10**	0.44**	0.14	0.16	0.72	0.74**	0.19	0.14	0.20	
TOA				–0.17**	–1.13**	0.21	–1.55	–0.71					
LEC-5_x_TOA			0.01*	–0.07*	–0.22*	0.10	–0.41	–0.03					

Note. Bolded names in the first column are outcomes; all others are predictors.

^a $p = 0.05$.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

more of a fixed mindset of anxiety, there was a stronger relationship between history of SLEs and the indicators of symptoms and coping strategies, compared to those with more of a growth mindset.

When SNAP-NT was added as a covariate in the regression models, three of the four significant interaction terms remained significant; the interaction term predicting depression symptoms did not reach statistical significance ($b = -0.09, p = 0.10, \Delta R^2 = 0.002$)³.

5. Discussion

The moderating role of mindsets in understanding the association between challenges and adjustment outcomes has been well established for mindsets of intelligence and personality. Here we tested whether

mindsets about anxiety would function in a conceptually similar way by moderating associations between history of SLEs and clinical indicators of adjustment. Results supported this hypothesis, such that correlations were stronger for those with more of a fixed mindset of anxiety.

In addition to its negative connections with psychological symptoms (Schroder et al., 2015, 2016), the growth mindset of anxiety may also be protective against adverse correlates associated with SLEs, which has important implications. First, it suggests decades of theorizing in the mindset domains of intelligence and personality can be translated for clinical purposes to the anxiety domain. In the intelligence domain, growth- and fixed-minded individuals attribute failed performance to lack of effort or to a lack of ability, respectively (Dweck & Leggett, 1988). Future research will need to identify the corresponding attributions relevant to the domain of anxiety. Perhaps anxious individuals with a fixed mindset of anxiety attribute their state anxiety – arising from an unpleasant interpersonal encounter for example – to their core disposition as an “anxious person” rather than the transient dynamics of the particular situation. It will also be important to understand how the anxiety mindset fits with other meta-cognitive constructs such as anxiety sensitivity (Reiss & McNally, 1985) and meta-cognitive beliefs (Wells, 1995). A second implication is that interventions designed to promote the malleability of personality in academic

³ In a final set of analyses, we tested whether mindsets of intelligence or personality also moderated the association between SLE and indicators of adjustment. None of these models yielded significant interaction terms, except for the ones in which drug abuse was the outcome ($ps = 0.03$ and 0.045 for the SLE × intelligence mindset and the SLE × personality mindset interaction terms, respectively). Thus, the moderating role of mindsets for more clinically relevant variables appears to be specific to the anxiety mindset domain.

contexts (Yeager et al., 2014) may be adapted to promote a growth mindset of anxiety to specifically target psychological distress and coping strategies. For instance, just as personality interventions consist of web-based tutorials that describe how personality “lives” in the brain and that the brain can change (so personality can change as well), an anxiety mindset intervention may describe how emotion regulation circuits in the brain can be strengthened with practice and effort – resulting in a change in anxiety.

Limitations included the self-reported measurement of SLEs without subjective experience ratings and the cross-sectional design. Nonetheless, findings provide initial evidence that the growth mindset of anxiety buffers relations between SLEs and psychological distress and coping strategies. These results add to those of previous studies that suggest fusing mindset theory with clinical psychology may prove valuable. All told, understanding how people think about their attributes may provide insights into the processes of risk and resilience.

Acknowledgements

HSS was supported by a National Science Foundation Graduate Research Fellowship (NSF Award No. DGE-0802267). JSM was funded by National Institutes of Health K12 grant (HD065879). Any opinions, findings, conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of these funding agencies. The authors declare there are no competing financial interests. Portions of the data were reported at the 2016 Association for Psychological Science Convention in Chicago, IL.

References

- Abramson, L. Y., Seligman, M. E. P., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*, 49–74.
- Blevins, C. A., Weathers, F. W., Davis, M. T., Witte, T. K., & Domino, J. L. (2015). The post-traumatic stress disorder checklist for DSM-5 (PCL-5): Development and initial psychometric evaluation. *Journal of Traumatic Stress, 28*, 489–498.
- Clark, L. A. (1993). *Schedule for nonadaptive and adaptive personality (SNAP)*.
- De Castella, K., Goldin, P., Jazaieri, H., Ziv, M., Dweck, C. S., & Gross, J. J. (2013). Beliefs about emotion: Links to emotion regulation, well-being, and psychological distress. *Basic and Applied Social Psychology, 35*(6), 497–505.
- De Castella, K., Goldin, P., Jazaieri, H., Heimberg, R. G., Dweck, C. S., & Gross, J. J. (2015). Emotion beliefs and cognitive behavioural therapy for social anxiety disorder. *Cognitive Behaviour Therapy, 44*(2), 128–141.
- Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality and development*. Philadelphia: Psychology Press.
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95*(2), 256.
- Dweck, C. S., Chiu, C. Y., & Hong, Y. Y. (1995). Implicit theories and their role in judgments and reactions: A word from two perspectives. *Psychological Inquiry, 6*(4), 267–285.
- Gray, M. J., Litz, B. T., Hsu, J. L., & Lombardo, T. W. (2004). Psychometric properties of the life events checklist. *Assessment, 11*, 330–341.
- Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.
- Infurna, F. J., & Luthar, S. S. (2016). Resilience to major life stressors is not as common as thought. *Perspectives on Psychological Science, 11*, 175–194.
- Kendler, K. S., Karkowski, L. M., & Prescott, C. A. (1999). Causal relationship between stressful life events and the onset of major depression. *American Journal of Psychiatry, 156*, 837–841.
- Klonsky, E. D., & Glenn, C. R. (2009). Assessing the functions of non-suicidal self-injury: Psychometric properties of the inventory of statements about self-injury (ISAS). *Journal of Psychopathology and Behavioral Assessment, 31*(3), 215–219.
- Kneeland, E. T., Dovidio, J. F., Joormann, J., & Clark, M. S. (2016). Emotion malleability beliefs, emotion regulation, and psychopathology: Integrating affective and clinical science. *Clinical Psychology Review, 45*, 81–88.
- Kronke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9. *Journal of General Internal Medicine, 16*(9), 606–613.
- Lahey, B. B. (2009). Public health significance of neuroticism. *American Psychologist, 64*(4), 241.
- Nock, M. K. (2010). Self-injury. *Annual Review of Clinical Psychology, 6*, 339–363.
- Norris, F. H. (1992). Epidemiology of trauma: Frequency and impact of different potentially traumatic events on different demographic groups. *Journal of Consulting and Clinical Psychology, 60*, 409–418.
- Pilkonis, P. A., Yu, L., Colditz, J., Dodds, N., Johnston, K. L., Mahioefer, C., ... McCarty, D. (2013). Item banks for alcohol use from the patient-reported outcomes measurement information system (PROMIS): Use, consequences, and expectations. *Drug and Alcohol Dependence, 130*, 167–177.
- Reiss, S., & McNally, R. J. (1985). The expectancy model of fear. In S. Reiss, & R. R. Bootzin (Eds.), *Theoretical issues in behavior therapy*. New York: Academic press.
- Schroder, H. S., Dawood, S., Yalch, M. M., Donnellan, M. B., & Moser, J. S. (2015). The role of implicit theories in mental health symptoms, emotion regulation, and hypothetical treatment choices in college students. *Cognitive Therapy and Research, 39*(2), 120–139.
- Schroder, H. S., Dawood, S., Yalch, M. M., Donnellan, M. B., & Moser, J. S. (2016). Evaluating the domain specificity of mental health-related mindsets. *Social Psychological and Personality Science, 7*, 508–520.
- Skinner, H. A. (1982). The drug abuse screening test. *Addictive Behaviors, 7*(4), 363–371.
- Valentiner, D. P., Jencius, S., Jarek, E., Gier-Lonsway, S., & McGrath, P. B. (2013). Pre-treatment shyness mindsets predicts less reduction of social anxiety during exposure therapy. *Journal of Anxiety Disorders, 27*, 267–271.
- Wells, A. (1995). Meta-cognition and worry: A cognitive model of generalized anxiety disorder. *Behavioural and Cognitive Psychotherapy, 23*, 301–320.
- Yeager, D. S., Johnson, R., Spitzer, B. J., Trzesniewski, K. H., Powers, J., & Dweck, C. S. (2014). The far-reaching effects of believing people can change: Implicit theories of personality shape stress, health, and achievement during adolescence. *Journal of Personality and Social Psychology, 106*(6), 867–884.