Beliefs About Stress Attenuate the Relation Among Adverse Life Events, Perceived Distress, and Self-Control

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Prior research has shown that adverse events in the lives of adolescents precipitate psychological distress, which in turn impairs self-control. This study ($N = 1{,}343$) examined the protective effects of *stress mindsets*— beliefs about the extent to which stress might be beneficial or strictly detrimental. The results confirmed that increasing the number of adverse life events across the school year predicted rank order increases in perceived distress, which in turn predicted rank order decreases in self-control. Adolescents who believed in the potential benefits of stress were less prone to feeling stressed in the wake of adverse life events. These findings suggest that changing the way adolescents think about stress may help protect them from acting impulsively when confronted with adversity.

Adolescents who experience adverse life events— such as parents fighting more than usual, a serious illness in the family, or close friends moving away —are more likely to smoke, act out, drink, earn lower grades, and drop out of school (Amato, 2000; Needle, Su, & Doherty, 1990; Newcomb & Harlow, 1986; Porche, Fortuna, Lin, & Alegria, 2011). Experimental research with laboratory animals and longitudinal studies of adolescents show that these adversity-induced impairments in self-control are not merely artifacts of third-variable confounds such as socioeconomic status (Arnsten, 2009; Duckworth, Kim, & Tsukayama, 2013). Still, identical life stressors can have very different effects; some adolescents suffer more than others (Bonanno & Diminich, 2013; Masten et al., 1999; Zeidner & Hammer, 1990). How can we explain this variability?

One possibility is that adolescents differ in *stress mindsets*, their implicit beliefs about stress. Although

research has not yet examined stress mindsets in adolescence, a study of adults has shown that some view stress as strictly harmful, whereas others view it as potentially beneficial (Crum, Salovey, & Achor, 2013). This framework may be especially useful in stress management during adolescence, a period of heightened emotional reactivity and brain plasticity (Eiland & Romeo, 2013; Steinberg, 2008). As shown in Figure 1, this study examines whether stress mindsets can mitigate the relation between adverse life events, perceived distress, and concomitant decreases in self-control.

Self-control refers to the ability to regulate impulses that compete with valued goals (Duckworth & Steinberg, 2015). The benefits of self-control are immense. For instance, self-control predicts academic achievement (Duckworth & Carlson, 2013) and psychological well-being during adolescence (Mischel, Shoda, & Peake, 1988; Shoda, Mischel, & Peake, 1990), as well as health, social, and economic outcomes 20 years later (Moffitt et al., 2011).

It has long been theorized that the perception of threat inclines individuals toward impulsivity. In
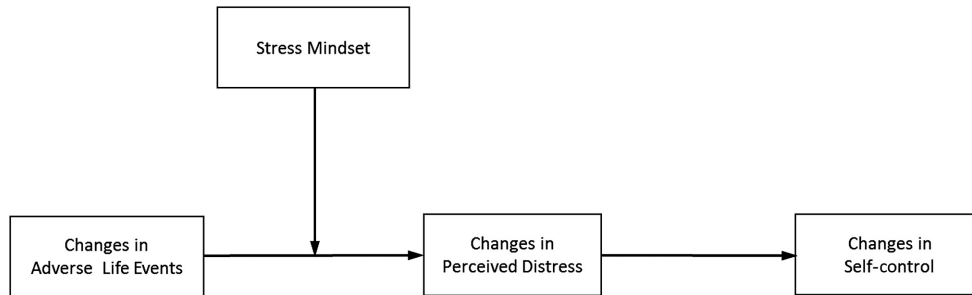
Figure 1. Conceptual moderated mediation model. The effects of adverse life events on growth in self-control are mediated by growth in perceived distress, and the effect of life events on perceived distress are moderated by stress mindset.

particular, Metcalfe and Mischel (1999) suggested that "quick responding driven by innately determined stimuli" may have been advantageous earlier in our evolutionary history, insofar as self-control required more reflection and planning (p. 8). Nevertheless, in contemporary times, adolescents are generally better off when they maintain top-down regulation over attention, emotion, and behavior.

Academic work and interpersonal relations are two domains of special relevance to self-control in adolescence (Caspi, Henry, McGee, Moffitt, & Silva, 1995). Thus, when middle school students are asked to report on behaviors in their daily lives that exemplify self-control failure, their responses produce a two-factor solution. Although moderately correlated ($r = .30$), academic self-control more robustly predicts grade point average (GPA), high school graduation rates, and college enrollment (Galla et al., 2014; Tsukayama, Duckworth, & Kim, 2013), whereas interpersonal self-control is associated with greater agreeableness and lower aggression (Tsukayama et al., 2013).

An investigation into the negative link between adverse life events and self-control may warrant greater attention during adolescence (Duckworth et al., 2013; Grant et al., 2003; Needle et al., 1990). During this stage of development, the brain undergoes considerable structural and functional change, particularly in areas related to reward systems and self-control (Steinberg, 2008). Relatedly, adolescence is a period marked by normative increases in risky, impulsive behaviors, including experimentation with drugs, unprotected sex, and reckless driving (Steinberg, 2007). These impulsive behaviors can initiate a vicious cycle by precipitating future adverse events (e.g., unwanted pregnancies, injury, or death of a friend; Moffitt et al., 2011).

Interestingly, the number of objective life stressors correlates only modestly with the degree of psychological distress experienced by adults ($r = .17–.20$; Cohen, Kamarck, & Mermelstein, 1983)

and adolescents ($r = .13$; Duckworth et al., 2013). *Stress* is defined as the occurrence of adversity in goal-related efforts, whereas *perceived distress* refers to the emotional experience of worry and perceived inability to cope with demands (Selye, 1975). In other words, the objective stressors in our lives are one thing, but how we react to them emotionally is another (Gross, 1998; Lazarus & Folkman, 1984; Schachter & Singer, 1962). In adults, distress predicts physical health better than the frequency of adverse life events (Cohen et al., 1983). Likewise, in adolescents, distress mediates the relation between adverse life events and subsequent impairments in self-control (Duckworth et al., 2013).

Differences in *stress mindsets* may help explain why adverse life events are only loosely coupled with the subjective experience of distress. Specifically, some individuals may hold more of a *stress-is-enhancing mindset*, the belief that stress can have positive consequences, Whereas others may have more of a *stress-is-debilitating mindset*, the belief that stress invariably leads to detrimental outcomes (Crum et al., 2013). Whereas individuals with a stress-is-enhancing mindset tend to embrace stressful situations as opportunities to learn and develop, those with a stress-is-debilitating mindset more rigidly interpret stress as an impediment to growth and vitality. In adults, a stress-is-enhancing mindset corresponds to lower levels of perceived distress and fewer symptoms of depression and anxiety, and predicts higher levels of energy, workplace performance, and life satisfaction (Crum et al., 2013).

Virtually nothing is known about how stress mindsets operate earlier in life, but prior research has shown that mindsets about intelligence (Blackwell, Trzesniewski, & Dweck, 2007) and personality (Yeager, Trzesniewski, Tirri, Nokelainen, & Dweck, 2011) profoundly influence adolescent development. In the current investigation, we followed a large, socioeconomically and ethnically diverse sample of

adolescents across a full school year, assessing adverse life events, perceived distress, and self-control in the fall and spring. We expected to replicate prior research showing that increases in adverse life events predict decreases in self-control, an effect mediated by concomitant increases in perceived distress (Duckworth et al., 2013). Most important, we hypothesized that adolescents with a stress-is-enhancing mindset would experience less psychological distress than peers with a stress-is-debilitating mindset, thereby mitigating the negative relation between adverse life events and self-control.

Method

Participants

Initially, data from 1,346 students were available. Of these, three students did not have any data on the variables in the model. Thus, these three students were excluded in the final sample. Final sample comprised 1,343 eighth grade (M_{age} = 14.77, SD_{age} = 0.59) students in eight middle schools in Pennsylvania, Idaho, California, and Texas. Approximately 52% were African American, 29% Caucasian, 12% Hispanic, 6% Asian, and 1% of other ethnic backgrounds. About 49% were female, and 63% were from low-income families as indicated by their eligibility for free or reduced-price meals. Data were collected from October 2014 to June 2015.

Measures

Adverse Life Events

Following prior research (Duckworth et al., 2013; adapted from Johnson & McCutcheon, 1980), adolescents were given a checklist of 14 age-appropriate negative life events in the fall and spring (e.g., "increased arguments or fights between parents," "close friend had problems"; Table 2) and were asked to indicate if any of these events had happened to them during the past 6 months. Prior research has established test–retest reliability as well as convergent and discriminant validity for this measure (Brand & Johnson, 1982). The distribution of adverse life events was positively skewed in the fall (skewness = 0.99, kurtosis = 0.92) and spring (skewness = 1.12, kurtosis = 1.51), so we log-transformed the data before performing the analyses shown here. Separately, we confirmed that the results were nearly identical to the untransformed life events variable.

Stress Mindsets

We selected three age-appropriate items from a stress mindset scale developed for adults (Crum et al., 2013). In the fall, on a 6-point Likert scale (1 = strongly disagree, 6 = strongly agree), adolescents indicated whether they believed stress leads to learning and growth, health and energy, and productivity (e.g., "Experiencing stress improves your learning and growth"; Appendix A). Higher scores represented higher levels of a stress-is-enhancing mindset. The observed alpha was .77. The distribution of stress mindsets was slightly positively skewed (skewness = 0.65, kurtosis = 0.001), so we log-transformed the data. As with adverse life events, results also were nearly identical when we used the untransformed stress mindset variable (results available on request).

Perceived Distress

In the fall and spring, adolescents completed six items adapted from the Perceived Stress Scale (Cohen et al., 1983) on a 5-point Likert scale (1 = never, 5 = always; see Appendix B). The scale measures the degree to which they have recently worried and experienced life as uncontrollable (e.g., "During the past month, how often have you felt stressed?" "During the past month, how often have you felt that difficulties were piling up so high that you could not overcome them?" "During the past month, how often have you felt worried?"). The observed alphas were .71 and .76 in the fall and spring, respectively.

Self-Control

In the fall and spring, adolescents completed a 10-item self-control scale adapted from the Impulsivity Scale for Children (Tsukayama et al., 2013). They responded to five items measuring academic self-control behaviors (e.g., "During the past month, I paid attention, even when there were distractions") and five items measuring interpersonal self-control behaviors (e.g., "During the past month, I behaved well even when I was upset.") using a 5-point Likert scale (1 = never, 5 = always). Prior work showed that items describing self-control in these domains correlate highly with the domain-general Brief Self-Control Scale (Tangney, Baumeister, & Boone, 2004) at r = .72–.88 (Tsukayama et al., 2013). The observed alphas were .85 in both fall and spring.

In addition, we asked English, social studies, science, and math teachers to rate each student on self-control. Following Galla et al. (2014) and

Park, Tsukayama, Goodwin, Patrick, and Duckworth (2016), we showed teachers all of the self-control items students completed about themselves and asked them to rate each student on academic and interpersonal self-control, respectively, using the same 5-point Likert scale (1 = never, 5 = always). The intraclass correlation coefficient was .83 for academic self-control and .81 for interpersonal self-control, indicating that teachers were highly consistent with each other in rating their students. Based on the high correlation between ratings of academic and interpersonal self-control ratings in the fall (r = .91, p < .001) and spring (r = .86, p < .001), we averaged academic and interpersonal self-control scores for each student at each time point (Appendix C).

Following Diener and Eid (2006), we created composite scores from self and teacher ratings to increase validity and reliability. The correlations between student and teacher rating were r = .46, p < .001 in the fall and r = .45, p < .001 in the spring. This compares favorably to meta-analytic correlations between child self-report and informant ratings of self-control (r = .48, Duckworth & Kern, 2011) (Please see Figure 1S in the supplementary information for an alternative way to average student and teacher ratings).

Demographic Information

We obtained data on gender, ethnicity, and free and reduced lunch status from school records.

Results

As shown in Table 1, adolescents reported an average of between two and three adverse life events in the fall (M = 2.90, SD = 2.56) and spring (M = 2.66, SD = 2.48). As shown in Table 2, 22% and 24% of adolescents reported not having any of 14 adverse life events in the past 6 months in the fall and spring, respectively. The most commonly reported adverse life event was a family member having problems (44% in the fall and 40% in the spring), followed by a close friend having problems (32% in the fall and 34% in the spring), and family financial troubles (30% in the fall and 29% in the spring).

Like adults (Crum et al., 2013), adolescents tended to believe that stress was more detrimental than enhancing (M = 2.46, SD = 1.17). Stress mindsets only weakly correlated with perceived distress in the fall (r = −.06, p = .042) and spring (r = −.06, p = .047), and with adverse life events in the fall (r = .06, p = .067) and spring (r = −.01, p > .10). Replicating previous findings (Crum et al., 2013), the magnitude of these associations indicate that stress mindsets are distinct from other stress-related constructs.

Next, we tested our hypothesis that rank order increases in perceived distress mediate the effect of rank order increases in adverse life events on rank order decreases in self-control and, moreover, that stress mindsets attenuate the association between life events and perceived distress. To do so, we fit a

Table 1

Descriptive Statistics and Bivariate Correlations Among All Measures

Measures	M	SD	1	2	3	4	5	6	7
Fall (T1)									
1. Stress-is-enhancing mindset	2.46	1.17							
2. Adverse life events	2.90	2.56	.06						
3. Perceived distress	2.83	0.71	−.06*	.41***					
4. Self-control	3.56	0.70	−.09**	−.07*	−.13***				
Spring (T2)									
5. Adverse life events	2.66	2.48	−.01	.56***	.32***	−.07*			
6. Perceived distress	2.89	0.76	−.06*	.38***	.60***	−.09**	.39***		
7. Self-control	3.46	0.80	−.09**	−.06*	−.10**	.82***	−.09**	−.12***	
Demographics									
8. Female	49%		−.10**	.20***	.21***	.18***	.19***	.27***	.16***
9. Caucasian	29%		−.12***	.04	.06*	.16***	.03	.01	.17***
10. African American	52%		.11***	.02	−.09**	−.29***	.03	−.04	−.30***
11. Hispanic	12%		−.01	−.01	.04	.08**	−.03	.02	.09**
12. Asian	6%		.01	−.10***	.02	.20***	−.07*	.03	.18***
13. Multiracial	1%		−.02	−.03	.00	.02	−.01	.01	.00
14. Free or reduced lunch	63%		.06	−.02	−.02	−.17***	−.02	−.01	−.19***

*p < .05. **p < .01. ***p < .001.

Table 2
Frequency of Adverse Life Events in Fall and Spring

Adverse life events in fall	Percentage in fall (%)	Percentage in spring (%)
1. Family member had problems	44	40
2. Close friend had problems	32	34
3. Family financial troubles or worries about money	30	29
4. Friends moved away or you moved away from friends	30	19
5. Increased arguments or fights between parents	29	28
6. Serious illness or injury of family member	26	26
7. Death of family member	25	22
8. Serious illness or injury of a close friend	14	15
9. Brother or sister leaving home	13	13
10. Parents separated or divorced	13	8
11. Increased absence of parents from the home	10	10
12. Major personal illness or injury	7	8
13. Death of a close friend	7	6
14. Mother or father lost job	6	7
15. None of above	22	24

longitudinal moderated mediation model with path analyses using *Mplus* (Muthén & Muthén, 2002). The autoregressive panel design we employed analyzes change. More broadly, when a prior measure of a variable is used as a predictor of that variable, then the coefficients of the other predictors in the model are interpreted as predicting changes in the outcome (Fleeson, 2007). Kessler and Greenberg (1981) note that "linear difference equations (those involving ∆X as dependent variable and equations involving only static scores [(X1 and X2]) are mathematically equivalent and can readily be transformed into one another" (p. 11). In other words, the same results are produced if actual change scores are used. We used full-information maximum likelihood (FIML) estimation, which provides less biased results with random missing values (Peters & Enders, 2002). We standardized all variables to facilitate interpretation of coefficients.

Based on prior research demonstrating demographic characteristics are associated with frequency of adverse life events (Gillum, Prineas, Gomez-Marin, Chang, & Finn, 1984; Gore, Aseltine, & Colten, 1992; Wilkie, 2001), self-control (Duckworth & Seligman, 2006; Mason & Windle, 2002; Moffitt et al., 2011), and GPA (Duckworth & Seligman, 2006), we controlled for demographic information. Furthermore, because middle school students move to different classrooms

during school days and were rated by multiple teachers (English, social studies, science, and math teachers), there is no practical way to examine analyses at the classroom level. Although students were nested in schools, eight clusters are not enough to conduct random-effects multilevel structure models. Therefore, in our analyses, to adjust for clustering, we dummy-coded the school variables and controlled for them in all analyses.

Goodness-of-fit indices for the model summarized in Figure 2 were good, $\chi^2(8) = 22.85$, $p < .01$, comparative fit index (CFI) = .99, root mean square error of approximation (RMSEA) = .037, 90% CI = [.020, .056]. The model fit was good whether we used self-reported self-control, $\chi^2(8) = 20.94$, $p < .01$, CFI = .99, RMSEA = .035, 90% CI = [.017, .053], or teacher-rated self-control, $\chi^2(8) = 17.61$, $p = .024$, CFI = 1.00, RMSEA = .030, 90% CI = [.010, .049].

As expected, when adverse life events increased across the school year, so too did perceived distress ($\beta = .21$, $p < .001$), which in turn predicted decreases in self-control over the same period ($\beta = -.05$, $p = .012$). We found that adverse life events had, via perceived distress, a significant indirect effect on self-control, 95% CI = [−.020, −.002]. Likewise, we confirmed that a stress-is-enhancing mindset attenuated the association between adverse life events and perceived distress. Specifically, the interaction term between number of adverse life events and stress mindsets reliably predicted changes in perceived distress ($\beta = -.06$, $p = .013$).

As shown in Figure 3, adolescents with a stress-is-debilitating mindset were more susceptible to elevated perceived distress due to adverse life events ($\beta = .27$, $p < .001$) than were adolescents with a stress-is-enhancing mindset ($\beta = .15$, $p < .001$). Additional analyses indicated that at low levels of adversity, the perceived distress level of adolescents with a stress-is-enhancing mindset and those with a stress-is-debilitating mindset were not statistically different ($\beta = .05$, $p > .20$). In contrast, at high levels of adversity, the perceived distress level of students with a stress-is-debilitating mindset was higher than those with a stress-is-enhancing mindset ($\beta = -.08$, $p = .02$).

In a separate model (available on request), we examined whether stress mindsets moderate the relation between changes in perceived distress and changes in self-control, but it did not ($\beta = -.004$, $p > .80$). In other words, it appears that stress mindsets may influence how adolescents react emotionally to objective stressors in their lives, not how their emotional response in turn influence their ability to regulate their impulses.
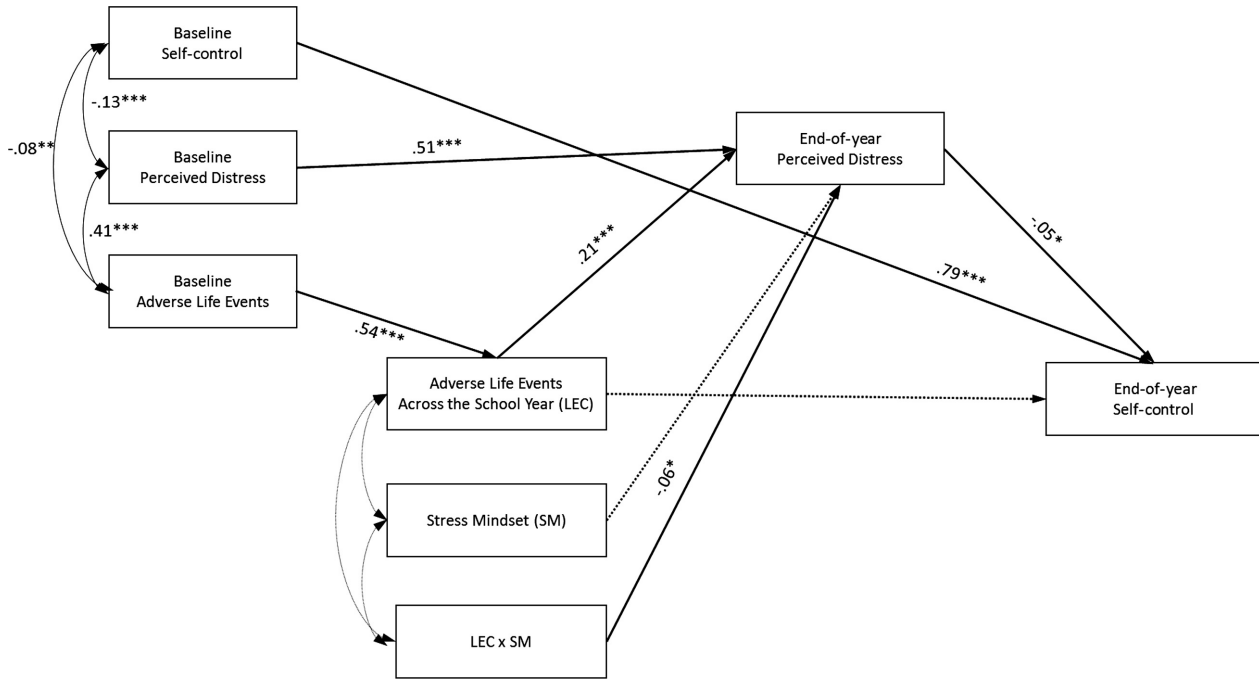
Figure 2. In this path model, the effects of negative life events on perceived distress vary as a function of stress mindset. All exogenous variables were allowed to correlate and the paths shown in the figure were freely estimated. Error variances for all endogenous variables were estimated (244 parameters were estimated). Values shown are standardized coefficients. Not shown are gender, ethnicity, lunch status, and school affiliation covariates (Please see Table S1 in the supplementary information for all path coefficients). Solid lines indicate significant paths, and dotted lines represent nonsignificant paths. Please see supplementary information (Table 2b) for coefficients for all paths included in the model. *p < .05.**p < .01. ***p < .001.
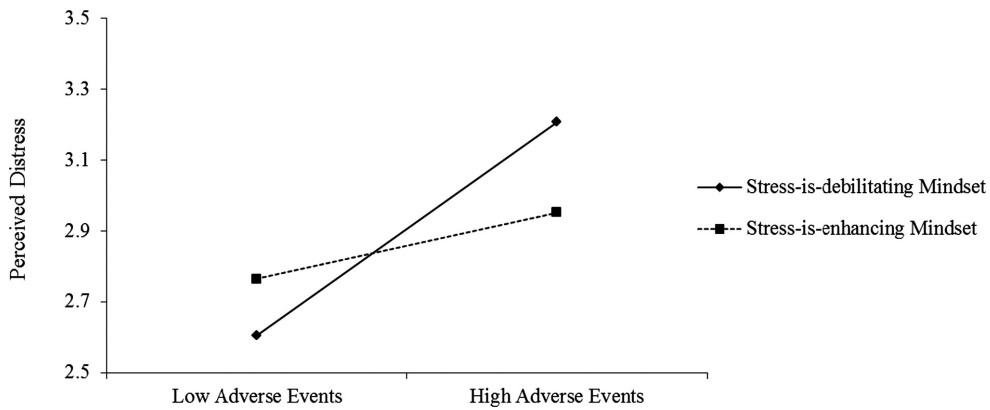

Figure 3. Perceived distress level in spring as a function of adverse life events and stress mindset. Low adverse life events and stress-is-debilitating mindset each refer to values 1 *SD* below the mean; high adverse life events and stress-is-enhancing mindset each refer to values 1 *SD* above the mean.

Because perceived distress and self-control were measured synchronously in the fall and spring, we considered the possibility of reverse moderated mediation. In other words, we tested an alternative to our theoretical model, specifying that changes in self-control predict changes in perceived distress. The interaction effect (Stress mindsets × Adverse life events) on self-control was not significant ($\beta = -.001$, $p > .90$).

The fit of this alternative path model ($\chi^2(8) = 27.84$, $p < .001$, CFI = .99, RMSEA = .04, 90% CI = [.026, .061]) was acceptable; however, the reverse mediation model's Akaike information criterion (AIC; 67,094.45) and Bayesian information criterion (BIC; 68,363.89) were greater than the original model's AIC (67,089.46) and BIC (68,358.91). Although AIC and BIC differences greater than 10 are

considered very strong evidence in favor of the model with the smaller values, a difference greater than 2 is still considered positive evidence for a better model (Franken, Laceulle, Van Aken, & Ormel, 2017; Raftery, 1995). Thus, we concluded that this alternative model did not fit the data as well as our posited theoretical model.

Discussion

This study is the first to show that although many adolescents believe stress is entirely harmful, others see its potential benefits. In a large and diverse sample of adolescents followed for an entire school year, increases in the number of adverse life events from fall to spring predicted rank order increases in perceived distress that, in turn, predicted rank order decreases in self-control over the same period. As hypothesized, the negative association between adverse life events and perceived distress was weaker for those who endorsed a stress-is-enhancing mindset.

This result raises important questions: How do stress mindsets develop? Why do some adolescents come to believe that stress is necessarily detrimental, whereas others are more inclined to see how it can lead to growth? One possibility is that adolescents model themselves after their parents and teachers; their beliefs are molded by how adults in their lives respond to adversity. Although the origins of stress mindsets are beyond the scope of our investigation, prior developmental studies have found that responses to success, failure, and mistakes by parents and teachers shape children's own theories of intelligence (Gunderson et al., 2013; Haimovitz & Dweck, 2016; Park, Gunderson, Tsukayama, Levine, & Beilock, 2016; Pomerantz & Kempner, 2013).

Also, we speculate that either stress mindset can be affirmed by experience. On one hand, the belief that stress is always debilitating can be reinforced when adverse events lead to perceived distress, impulsive behavior, and bad outcomes. On the other hand, the belief that stress can sometimes lead to growth and development can also be reinforced, especially when challenges are met with effortful mastery (cf., Kubala, Christianson, Kaufman, Watkins, & Maier, 2012).

Regardless of ontogeny, our findings suggest benefits of a stress-is-enhancing mindset in adolescence. In adults, brief manipulations (e.g., video clips describing stress as either enhancing or debilitating) have been shown to produce measurable benefits for health and work performance 1 week later (Crum et al., 2013). Can stress mindsets

likewise be changed in adolescents? If so, will such changes show enduring benefits, as has been demonstrated for changing adolescents' mindsets about intelligence and personality (Blackwell et al., 2007; Yeager, Trzesniewski, & Dweck, 2013)? Additional research is needed to answer these questions.

Another fruitful direction for future research is to assess life events more comprehensively than was possible in this investigation. Following Evans (2004, 2006), we took a cumulative risk approach by counting the number of adverse life events adolescents experienced in the past 6 months. We found no clear relations between particular types of life events and perceived distress, but separate theoretical and empirical work suggests that the nature of adversity may matter (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Kanner, Coyne, Schaefer, & Lazarus, 1981). It is also true that hassles in everyday life can influence psychological and somatic symptoms at least as much as major life events (DeLongis et al., 1982; Kanner et al., 1981). Furthermore, although we only asked about adverse life events during the past 6 months, it is possible that the effects of life events vary depending on whether they are chronic or acute. Longitudinal research with a longer time horizon is needed to more fully probe the effects of enduring versus transient adversity.

Last, in this first-ever study of stress mindsets in children, we did not include items asking about the detrimental effects of stress. Because stress is commonly described as damaging, we assumed that all children would agree that it has detrimental effects (see Hong, Chiu, Dweck, Lin, & Wan, 1999 for a similar methodology to avoid social desirability bias). Nevertheless, further investigation is needed to confirm our results with items that directly measure beliefs about the detrimental effects of stress.

Although everything should be done to limit the occurrence of unfortunate events in the lives of young people, our findings also suggest that altering implicit beliefs about stress may buffer against associated psychological distress and, in turn, impairments in their self-regulatory capacity. Indeed, our view is that a better understanding of the ontogeny of stress mindsets will pave the way to psychologically wise interventions (Walton, 2014) that, we hope, support the well-being and development of adolescents facing adversity.

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Appendix A

Stress Mindset Scale

Please rate how much each statement describes you using the scale below.

1. Experiencing stress improves your health and increases your energy level.
2. Experiencing stress improves your productivity. You get more done when you experience stress.
3. Experiencing stress improves your learning and growth.

Appendix B

Perceived Distress Scale

During the past month, how often have you felt . . .

1. That you were unable to control the important things in your life?
2. Confident about your ability to handle your personal problems?*
3. That things were going your way?*
4. Difficulties were piling up so high that you could not overcome them?
5. Stressed?
6. Worried?

*Reverse coded items.

Appendix C

Self-Report Self-Control Measure

During the past month . . .

1. I came to class prepared.
2. I followed directions.
3. I got to work right away instead of waiting around until the last minute.
4. I paid attention, even when there were distractions.
5. I stayed focused when doing independent work.
6. I stayed calm even when others bothered or criticized me.
7. I allowed others to speak without interruption.
8. I was polite to classmates.
9. I controlled my temper.
10. I behaved well even when I was upset.

Teacher Rating of Self-Control

Please rate [CHILD NAME] during the past month:

Academic Self-Control

1. Came to class prepared.
2. Followed directions.
3. Got to work right away instead of waiting around until the last minute.
4. Paid attention, even when there were distractions.
5. Stayed focused when doing independent work.

Interpersonal Self-Control

1. Stayed calm even when others bothered or criticized her/him.
2. Allowed others to speak without interruption.
3. Was polite to classmates.
4. Controlled her/his temper.
5. Behaved well even when s/he was upset.

Supporting Information

Additional supporting information may be found in the online version of this article at the publisher's website:

Figure S1. Analyses Standardizing Each Teacher's Rating First Then Standardize Across Teachers Before Combining With Students' Rating

Table S1. Coefficients, *SE*, and *p*-Values for All Paths Included in Figure 2