

## Novel Perspectives on Adversity Exposure, Stress Responding, and Academic Retention Among First- and Continuing-Generation Students

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### **Abstract:**

First-generation college students are less likely to complete their degrees than continuing-generation students, in part due to experiences of educational and socioeconomic adversity. Accounting for adversity and its downstream implications is likely to suggest new interventions that promote resilience and retention of these students. We propose a novel model in which the influence of adversity on long term academic outcomes acts through indicators of stress responding, then through academic avoidance behaviors. The strength of this pathway depends upon both a cognitive processing characteristic that affects stress responding—trait rumination—and levels of enacted family support during college. This perspective suggests specific targets for intervention that include decreasing levels of rumination, increasing levels of family support, and decreasing academic avoidance behaviors for all students, but might be particularly relevant to first-generation students.

**Keywords:** retention | first-generation | adversity | stress reactivity | avoidance

### **Article:**

Attainment of a four-year post-secondary degree portends considerable occupational and economic benefits (Baum, 2014). However, college attendance represents a potentially challenging time for young people, and a concerning proportion of students who enroll in college fail to attain a degree (Shapiro et al., 2018). Risk of non-completion is even higher for first-generation college students than for their peers whose caregivers have themselves negotiated the post-secondary environment (Chen & Carroll, 2005).

One possible factor contributing to non-completion is life adversity. In the present review, we use the term adversity to refer to life events and chronic problems that have negative impacts on students' lives and that are distinct from perceived stress, which captures emotional responses to these life circumstances. What little work has focused on adversity exposure among first-

generation students indicates that first-generation college students experience a greater burden of adversity both prior to and during college. Examples include greater difficulty paying for college and a potential cultural mismatch with the individualistic middle-class norms characterizing most colleges and universities (Stephens et al., 2012). First-generation college students are more likely to come from racially/ethnically minoritized (especially Hispanic/Latinx) and immigrant backgrounds (Saenz et al., 2007) and from rural areas (Reid et al., 2021). Diverse first-generation students are also subject to a range of experiences of discrimination and microaggression on college campuses, from faculty and others (Elder et al., 2018). Indeed, “first-generation” in many ways serves as a proxy for multiple types of structural disadvantage resulting from intersecting marginalized identities (e.g., socioeconomic status, race/ethnicity, rural upbringing; Nguyen & Nguyen, 2018) that impart higher likelihood of adversity exposure (and its downstream sequelae).

First-generation college students are also more likely than their continuing-generation counterparts to encounter major life adversities outside of the college environment during college, such as family illness, divorce, or death (Wilbur & Roscigno, 2016). Interventions that acknowledge the impact of such a wide range of challenges have the potential to bolster graduation rates, especially among first-generation college attenders who are more likely to experience adversity both within and outside of the college environment. Although researchers have readily documented the prevalence of such adversity exposure in the lives of first-generation students (Wilbur & Roscigno, 2016), most interventions focused on increasing retention within this population have emphasized connecting students to campus resources (e.g., Folger et al., 2004) or changing their beliefs or cognitions about belonging on campus (Buzetto-Hollywood et al., 2019). Existing interventions have largely not acknowledged the myriad of ways in which adversity exposure prior to college enrollment and experienced throughout college might impact students (i.e., by triggering maladaptive psychological and physiological stress responses; for an exception, see Stephens et al., 2015), nor the ways in which such maladaptive stress responses may prompt disengagement from the learning process, with students avoiding engaging in the behaviors that support academic success (Boyras et al., 2019).

In the present review, we propose a novel moderated serial mediation model that applies psychological principles to understand how adversity exposure contributes to lower graduation rates, and to suggest how these pathways can be interrupted to benefit students. In short, evidence suggests that: (a) first-generation students experience greater levels of a variety of types of adversity than do continuing-generation students, (b) this heightened adversity predicts maladaptive stress responding patterns (indicated at both an affective, emotional level and a physiological level), (c) these patterns then lead to academic behavioral avoidance, and (d) this process finally culminates in lower college retention. We propose that the risk represented in such a pathway might be exacerbated by maladaptive cognitive approaches to handling adversity (i.e., trait rumination), but attenuated by family involvement (i.e., enacted family support). We theorize that this model likely applies to all students but is particularly relevant for first-generation students who often experience higher baseline levels of adversity exposure—especially during the transition to their first year of college enrollment when risk for college-leaving is highest (Pratt et al., 2019).

This model is highly pertinent in the current climate, when adversity exposures are increased for many (i.e., COVID-19 related economic, health, and social adversities) and when widespread remote/online education makes behavioral avoidance all the more detrimental to students in the absence of traditional in-person tools for accountability and engagement. Although we acknowledge that the impacts of student adversity can best be reduced through a comprehensive

set of multilevel responses that decrease both the conditions that create and exacerbate adversity on college campuses (e.g., interventions at the system level that increase accessibility of adequate financial aid and create environments that are welcoming to students of all backgrounds) and equip students to cope with their adversity experiences (at the social-personal level), our research and the present review focus on the social-personal level of analysis.

### **Post-secondary Graduation Rates**

A large majority (69%) of students who graduate high school enroll in college immediately afterward (National Center for Educational Statistics, 2018). Yet despite these relatively high rates of initial enrollment, nearly two-fifths of matriculating first year students fail to achieve a college diploma within 6 years of enrollment, with about half of these departures occurring during the first year of college. These numbers are even more concerning among first-generation students, defined by the United States Department of Education (2016) as students whose caregivers did not obtain a baccalaureate degree. A report of three nationally representative samples indicated that three years after enrollment, 1/3 of first-generation students had left college, compared to just 14% of continuing-generation students (Cataldi et al., 2018). This disparity between first-generation and continuing-generation students has long-term implications for financial standing and well-being. Specifically, in 2015, college students who graduated with a bachelor's degree had 64% higher median earnings than those with only a high school diploma (\$50,000 vs. \$30,500; McFarland et al., 2017). In turn, adults with higher incomes report greater physical health (Evans et al., 2008) and life satisfaction (Clark et al., 2005), among other indicators. For all these reasons, it is important to identify factors that support post-secondary academic success and retention, and it is especially important to focus on promotion of college completion among first-generation students.

### **Retention Interventions: Current Approaches and Gaps**

Developing effective strategies to increase post-secondary retention rates is a goal shared by college administrators and researchers alike. Not surprisingly, research focused on testing the efficacy of such interventions has tended to focus on those students who are at greatest risk for dropout—with risk defined in terms of both characteristics that accompany students when they matriculate (e.g., first-generation status, membership in marginalized racial/ethnic groups, diagnoses of attention deficit hyperactivity disorder) and academic risk identified during college enrollment (e.g., academic probation). Interventions have tended to fall within two categories.

In the first category are interventions that focus on increasing student use of campus support resources. One example of such interventions is the effective Freshman Empowerment Program (Folger et al., 2004) at Central Michigan University through which facilitators introduced first-generation college students to support offices on campus. In another example, Schwartz et al. (2018) reported that an intervention designed to increase levels of social capital among first-generation students resulted in increases in positive attitudes about seeking support, greater seeking out of support, more positive relationships with instructors, and higher academic grades, compared with students who did not experience the intervention.

The second category of interventions has focused on changing how students think or feel. Examples from this category include helping first-generation students to see their personal backgrounds as strengths that can help them succeed in a college setting. Stephens et al. (2015) found that a one-hour intervention encouraging first-generation students to think about ways in

which their social class backgrounds might be a source of strength in the college setting resulted in students reporting greater feelings of social and academic belonging and psychological well-being 1 year later than did students who did not receive the intervention. Interestingly, these students were also more likely to seek out support resources on campus and experienced greater academic success than students in the control group. Tibbetts et al. (2016) reported that first-generation students who participated in a values-affirmation intervention received higher grades in a biology course. Bruno et al. (2019) included both growth mindset and belongingness conditions in their study of first-year students and found that increases in the GPAs of Latinx students occurred only the growth mindset group. Bailey and Dynarski (2011) improved academic outcomes for first-generation students and students from disadvantaged socioeconomic backgrounds by enrolling them in a first-year development course focusing on grit, locus of control/self-efficacy, the importance of a growth mindset, and goal setting. Wibrowski et al. (2017) introduced a Skills Learning Support Program to target first-generation students' motivational beliefs and self-regulation. The researchers observed one-year improvements in participating students' feelings of motivation, study skills, and academic achievement, although these effects decreased over time.

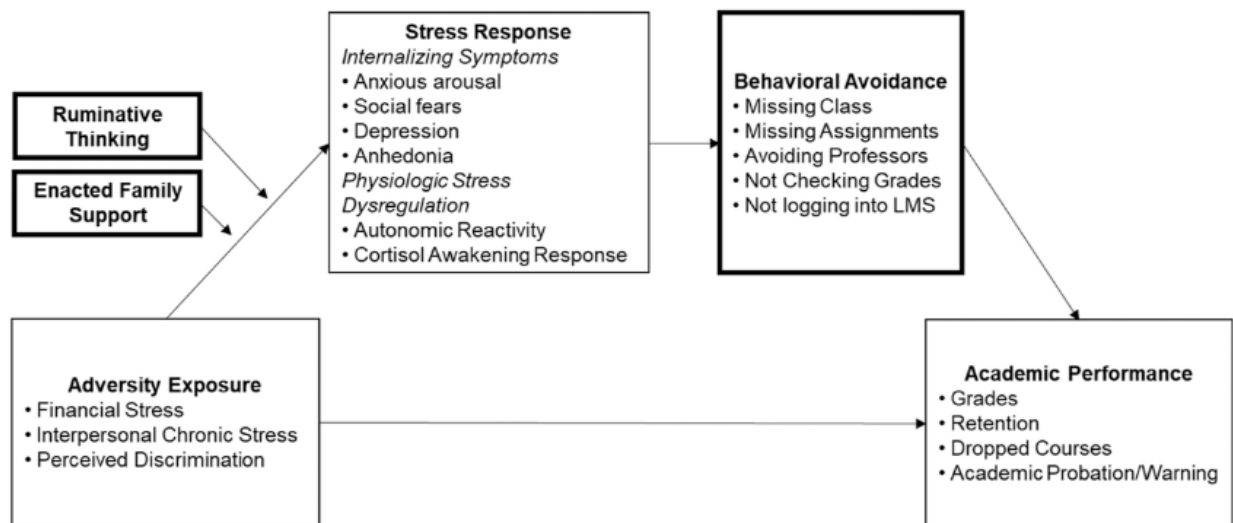
Despite considerable evidence that both adversity exposure and stress responses to such exposure predict college leaving (Terriquez & Gurantz, 2015) and that levels of adversity exposure are higher among first-generation college students (Wilbur & Roscigno, 2016), available interventions have not explicitly focused on the lessening the impact of adversity exposure preceding and during the developmental transition to college (Zuo et al., 2018). Given these gaps, here we introduce one potential model linking adversity exposure with college retention and we highlight three potential intervention targets that might disrupt this pathway. This model addresses the field's relative lack of attention to the impact of adversities encountered by college students (ranging from major stressful life events to chronic stress to daily discrimination), with attention to ways in which the vulnerability imparted by adversity may be moderated, that is, exacerbated or mitigated.

## **Proposed Model**

### **Overview**

We propose a moderated serial mediational model (Figure 1) in which the pathway connecting adversity exposure to academic failure is characterized by maladaptive stress responding as indicated by both higher levels of internalizing problems (Lathren et al., 2019) and dysregulated physiological stress response (Shalev et al., 2020). Students experiencing these emotional and physiological indicators of maladaptive stress response are then more likely to engage in behavioral avoidance of academic tasks (Boyratz et al., 2019) that then leads to a downward academic trajectory. Critically, these pathways are likely stronger for some individuals than for others. Specifically, we propose that individual differences in both student cognitive styles and levels of family support likely moderate the pathway from adversity to stress responding, providing important points for intervention with the potential to increase both psychological health and academic success among first-year college students from all backgrounds. Directly targeting downstream behavioral avoidance is another possible point for intervention. We acknowledge that several of these pathways are likely to be bidirectional in nature (e.g., depression and academic difficulties can spur future adversity). We also acknowledge that the model plays out repeatedly

over time and across a range of adversity types. Some adversity is experienced prior to college enrollment, some continues across the transition to college, and some is new during (and perhaps specific to) the college experience. Thus, the proposed model is applicable across a wide range of student experiences. For conceptual clarity and conciseness, we focus on a specified direction of effect and order of variables. Here we consider each of the paths in Figure 1.



**Figure 1.** Novel model of adversity exposure’s impacts on academic performance among first- and continuing generation college students. Note. Bulleted examples are not exhaustive. Potential points of intervention in bold boxes. LMS = Learning management system (e.g., course website, Blackboard, and Canvas).

### *Associations between Adversity Exposure and Academic Performance*

The transition into post-secondary education with its accompanying academic and social changes can be stressful for all students, with increases (from high school) in anxiety, depression, loneliness, and sleep deprivation reported by first year college students (Doane et al., 2015; Drake et al., 2016; Terry et al., 2013). However, first-generation students face additional challenges including lower levels of academic preparedness (Chen & Carroll, 2005), greater financial need (Pryor et al., 2006), lack of a financial “safety net” from parents (Gower, 2018), and lower levels of family and peer support than do continuing-generation students (Jean-Van Hell, 2007). Further, they are likely to endorse other marginalized identities (Saenz et al., 2007), and the adversities associated with these racial/ethnic, socioeconomic, and immigrant identities may be compounded by those associated with first-generation status. Recent theoretical advances have highlighted that many of the barriers faced by first-generation students are a result of structural and systematic oppression (Garriott, 2020), both prior to college enrollment and once they arrive on often predominately White campuses characterized by upper/middle class values and expectations (Ives & Castillo-Montoya, 2020). We posit that student experiences of, and responses to, life adversity are linked with academic outcomes such that as, other evidence indicates, during their first year of college first-generation students receive lower academic grades than their continuing-generation peers (Covarrubias et al., 2020), contributing to the greater likelihood that first-generation students will withdraw from their college or university after a single year of attendance (Pratt et al., 2019). This suggests that the adversity first-generation students face causally contributes to lower

graduation rates, and that conceptual models informing interventions need to integrate adversity, indicators of vulnerability/resilience to adversity, and their downstream sequelae.

### *Indicators of Maladaptive Stress Responding*

Although some of the adversities experienced by first-generation students directly interfere with academic achievement (e.g., financial hardships causing an inability to pay tuition and directly leading to unenrollment), it is likely that associations between adversity exposure and academic performance are due in part to college students' responses to that adversity, which can take many forms. Of particular importance are both internalizing mental health symptoms and physiological markers of maladaptive stress responding.

### *Internalizing Symptoms as a Psychological Indicator of Maladaptive Stress Responding*

“Internalizing” symptoms—those related to anxiety or depression—are among the most prevalent and costly to society in terms of their impact on lost productivity, treatment cost, and lost years of life (Liu et al., 2020). Moreover, internalizing symptoms are particularly prevalent during early adulthood, perhaps because of the transition to independence and significant changes to relationships that tend to occur during this period (Rohde et al., 2013). Within internalizing, depression refers to a pattern of low mood and/or loss of interest or pleasure in activities accompanied by other symptoms such as changes in sleep and appetite, feeling worthless, and thinking about death or suicide (APA, 2013). Anxiety captures a wide range of potential diagnoses and tends to encompass excessive worry about the future, unfounded fears, physical and emotional panic sensations, and feeling chronically keyed up and tense. Anxiety can manifest as subclinical anxiety symptoms or as diagnoses such as panic disorder (preoccupation with recurrent panic attacks), generalized anxiety disorder (pervasive, uncontrollable, and unrealistic worry), and social anxiety disorder (fear of being negatively evaluated in social settings; American Psychological Association, 2013).

Several decades of evidence indicate that adversity precipitates internalizing symptoms and diagnoses (Brown & Harris, 1978; Monroe and Jensen, 2008). Although acute stressful life events (e.g., romantic breakup and loss of loved one) are the most commonly studied form of adversity, chronic stress, which refers to the extent of ongoing (non-acute) life strain across multiple life domains (e.g., relationships, financial well-being, and health) from best to worst possible circumstances (Hammen et al., 2009), is also consistently implicated (Vrshek-Schallhorn et al., 2019). Similarly, other forms of adversity that have received somewhat less attention include discrimination and microaggressions, and daily hassles. Comparatively more work has examined depression as an outcome of adversity (Hammen, 2005), but evidence also supports this pathway to anxiety (Asselmann et al., 2015; Young & Dietrich, 2015).

Perhaps most importantly to the proposed model, symptoms of depression and anxiety (especially those that result in behavioral avoidance) contribute to poorer scholastic achievement across developmental periods incorporating both school-aged children (Rappport et al., 2001) and college students (DeRoma, Leach, & Leverett, 2009), and anxiety has been shown to erode memory performance (Bowman et al., 2019). In a 6-year longitudinal study of college students, emotional adjustment predicted graduation rates better than scholastic preparedness (Gerdes & Mallinckrodt, 1994), and emotional adjustment out-paced high school grade point average and college entrance exam scores in predicting retention over 1.5 years (Saunders-Scott et al., 2018).

Taken together, given their negative impact, their prevalence during early adulthood, and their strong linkage with prior adversity as well as future college performance and retention, internalizing symptoms are critical in models of academic performance for college students.

### *Physiological Indicators of Maladaptive Stress Responding*

In addition to psychological indicators, stress responding involves physiological indicators, an objective complement to self-reported internalizing measures that allows capture of more holistic responses to adversity at multiple levels of measurement (Insel et al., 2010). The human body has two primary stress-responsive physiological systems. First, the autonomic nervous system (ANS) responds most rapidly (within seconds) to stress, with its sympathetic branch (SNS) dedicated to enabling fight, flight, or freeze behaviors in the face of threat (for a review, see O'Connor et al., 2021) and the parasympathetic nervous system (PNS) branch dedicated to tempering sympathetic responding to facilitate relaxation and support such functions as rest, digestion, and procreation (Berntson et al., 2007). Second, the Hypothalamic Pituitary Adrenal (HPA) axis, with its primary endpoint hormone cortisol, responds somewhat more slowly (initiating within minutes) but facilitates a sustained response to threats (Lupien et al., 2009). In the short-term, cortisol serves an important function in that it mobilizes physiological resources in times of challenge. In the long-term, however, elevated levels of cortisol predict higher levels of inflammation risk burden that predict a range of diseases in adulthood (Piazza et al., 2018). While there are numerous indices and paradigms available to assess functioning in these two systems, we highlight several examples that may be particularly relevant to the proposed model.

*Adaptive Autonomic Reactivity* From a physiological perspective, adaptive functioning is dependent on the ability of the ANS and HPA axis to respond to challenge in a manner that is both flexible and regulated, upregulating to an appropriate level, and downregulating efficiently. Adaptive ANS responding during times of challenge is indicated by activation of the SNS and deactivation of the PNS, resulting in increases in heart rate or respiratory sinus arrhythmia (RSA), the change in heart rhythm that occurs between inhalation versus exhalation. Importantly for the purposes of this model, both of these physiological indicators (e.g., autonomic flexibility) are associated with stronger performance on cognitive tasks during young adulthood (Mathewson et al., 2010; Duschek et al., 2009). In turn, better performance on cognitive tasks predicts stronger academic performance (O'Connell, 2018). A meta-analysis focusing on associations between PNS reactivity and children's adjustment indicated that greater PNS reactivity (RSA withdrawal) was associated with lower levels of cognitive/academic problems (Graziano & Derefinko, 2013). Little research has been conducted with college student samples focusing on associations between PNS reactivity and academic achievement. However, Thomas and Viljoen (2019) documented a positive association between heartbeat during a cognitive challenge task and academic grades among first-year college students.

*Cortisol Awakening Response as an Index of HPA Health* HPA axis activity has been documented as a consequence of adversity exposure among first-generation students and is linked with academic performance. Specifically, experimentally manipulated exposure to individualistic university norms predicts both increases in first-generation students' momentary cortisol levels and hampered performance on an academic-related task (Stephens et al., 2012). Within the HPA axis, the non-invasive Cortisol Awakening Response (CAR) measures the 50–150% increase in

cortisol level that occurs within approximately 30 minutes of waking (Clow et al., 2010). Cortisol levels follow a well-described “diurnal rhythm” or pattern, in which levels begin somewhat high at morning waking, further rise sharply in the 30 minutes following awakening to a typical peak for the day, and then decline throughout the day to a nadir around midnight and rise again slowly during sleep until morning (e.g., Fries et al., 2009). CAR is thought to have a preparatory function, serving to mobilize physiological and cognitive resources to respond to anticipated demands of the upcoming day. For example, higher morning CAR appears to follow negative emotions the prior night (Adam et al., 2006), and CAR is higher on days with an anticipated psychosocial stress task (Wetherell et al., 2015) as well as among people who plan to complete challenging tasks later that day (Elder et al., 2018). While short-term elevation in cortisol levels can be adaptive to meet a challenge, elevations that are too frequent or pronounced likely indicate struggle. Not surprisingly then, the CAR is associated with depression (Vrshek-Schallhorn et al., 2013) and anxiety disorders, particularly social anxiety (Adam et al., 2014), even when accounting for self-reported trait neuroticism (persistent negative affect), momentary affect at the time of collection, and prior diagnoses in these studies. CAR provides a useful snapshot of the functioning of the HPA axis that varies based on individual experiences and illustrates how physiological indicators complement self-reported indicators of psychological well-being and stress responding.

### **Stress Response as a Predictor of Behavioral Avoidance**

Those individuals who are most impacted by adversity—that is, those with the most maladaptive physiological stress response indicators and those with the greatest depression and anxiety symptom elevations—are also the students most likely to engage in behavioral avoidance, leading to problems in academic performance. Thus, we posit a mechanistic chain in which emotional and physiological stress response indicators predict academic behavioral avoidance along the pathway to poor academic performance and a higher likelihood of college withdrawal. There is evidence that first-generation college students report less active engagement in the classroom (e.g., contributing to class discussions, asking questions, and interacting with instructors; Soria & Stebleton, 2012), which we posit could be a signal of behavioral avoidance related to disparities in prior adversity exposure and stress responding.

A substantial literature implicates avoidance as a key correlate of both depression and anxiety symptoms (Ottenbreit & Dobson, 2004); avoidance and internalizing are mutually influential, with avoidance conceptualized as a coping strategy (Moos & Holahan, 2003), a problem-solving style (D’Zurilla & Nezu, 2010), and a personality dimension that predisposes people to internalizing problems more broadly (Corr & McNaughton, 2012). Here, we are most concerned with those manifestations of behavioral avoidance that impart risk for later academic problems. Behavioral avoidance can be active (e.g., distraction with a replacement activity) or passive (e.g., procrastination without a replacement activity). A number of studies have supported that both anxiety (Ottenbreit & Dobson, 2004) and depression (Carvalho & Hopko, 2011) are strongly correlated with behavioral avoidance, so strongly in fact, that reducing avoidance is seen as a key feature of many evidence-based cognitive behavioral interventions for depressive and anxiety symptoms (e.g., Farchione et al., 2012). Thus, it is relatively clear that emerging internalizing symptoms are likely to precipitate increases in academic avoidance behaviors.

The relationship of physiological indicators of maladaptive stress responding with academic behavioral avoidance is less well-documented. On the one hand, physiological stress response indicators are clearly related to avoidance behavior in the moment. For example, the



certainty or proximity of a threat predicts increases (when facilitating flight) and decreases (when facilitating freezing) in heart rate (Wendt et al., 2017). Further, lab-based evidence shows that individuals with social anxiety have greater cortisol reactivity to a lab-based stress induction than do healthy controls and that the magnitude of their cortisol responses is associated with the extent to which they engage in avoidance behavior in a laboratory task (Roelofs et al., 2009). Less clear is the relationship of physiological stress response indicators to long-term behavioral avoidance, including academic behavioral avoidance as described in the present model. For example, whether heightened CAR at a baseline measurement is associated with a withdrawal of effortful exertion over the coming months is not known. This represents a gap in current understanding; however, based on the relationship of HPA and SNS dysregulation with both immediate avoidance behaviors (e.g., Roelofs et al., 2009) and with other negative long-term mental health outcomes (Vrshek-Schallhorn et al., 2013; Adam et al., 2014) we hypothesize that HPA and SNS dysregulation will also predict prospective elevations in behavioral avoidance.

### *Behavioral Avoidance Predicts Poor Academic Performance*

By contrast, associations between student avoidance behaviors and academic performance are well-documented (Broda et al., 2018) and intuitive. Academic success is facilitated when students attend class and participate in learning activities, turn in assignments, and communicate with their instructors regarding expectations and challenges. Not only are more engaged and successful students more likely to attend class and participate in classroom activities, requiring student attendance in lower-level classes improves academic performance (Moore & Jensen, 2008). Students who fail to attend class set themselves on a trajectory that is hard to disrupt. The connection between failing to turn in assignments and academic grades is clear: Assignments that are not turned in cannot be graded. Finally, positive contact between students and faculty is a strong correlate of academic success and may be particularly important during the first year of college attendance (Trolan et al., 2016). Students who avoid interacting with their instructors miss important opportunities to increase overall feelings of institutional engagement and support, as well as increase understanding of subject matter and receipt of instructional support. We acknowledge that higher academic avoidance and lower academic engagement among first-generation students are likely multiply-determined, reflecting factors such as lower levels of social capital among first-generation students and lack of familiarity with the academic system and how to negotiate it (Stroud, Vrshek-Shallhorn, Norkett, & Doane, 2019). We focus in our model on one route through which avoidance behaviors might be exacerbated—one which focuses on levels of adversity exposure and stress responding.

### *Rumination as a Moderator of Links between Adversity Exposure and Stress Response*

It is highly likely that the pathway from adversity to retention through stress responding is more relevant for some individuals than others. Consistent with diathesis stress theory (Monroe & Simons, 1991) and cognitive response styles theory (Shaw et al., 2019), one individual characteristic that is important in predicting maladaptive responses to adversity is trait rumination, the extent to which individuals tend to engage in passive, perseverative, self-relevant, negative thought about the causes and consequences of feeling down (Smith & Alloy, 2009). This type of repetitive cognition eschews problem solving and proactive planning, but instead focuses passively on internal thoughts and feelings, tending to prolong low moods and permitting life problems to

fester. Ruminative thinking is a transdiagnostic risk factor for internalizing disorders (i.e., depression and anxiety disorders; McLaughlin & Nolen-Hoeksema, 2011; Michl, et al., 2013), and some theorize that trait rumination amplifies adversity's effects (Young & Nolen-Hoeksema, 2001). Trait rumination is elevated in actively depressed and remitted individuals (D'Avanzato et al., 2013), predicts future depression (Rood et al., 2009), and has high test-retest stability (Roelofs et al., 2006), suggesting it is both stable over time and an important source of individual variability in the strength of associations between adversity and internalizing symptoms. Rumination has also been shown to predict maladaptive physiological responses to adversity exposure: It predicts more maladaptive cortisol responding lab-based social-performance stress inductions (Vrshek-Schallhorn et al., 2018) and is linked to maladaptive patterns in cortisol's diurnal rhythm (Zoccola & Dickerson, 2012) as well as ANS responding (Aldao et al., 2014). Thus, trait rumination is a theoretically and empirically supported candidate as a moderator of the pathway between adversity exposure and maladaptive stress responding. For those who tend to engage in rumination, the relationship between adversity and both maladaptive emotional and physiological stress responding will be stronger than for those who eschew this passive, self-focused negative thinking style.

### *Enacted Family Support as a Moderator of Links between Adversity Exposure and Stress Response*

While trait rumination might predict an amplified maladaptive response to adversity, other factors likely buffer responses to adversity. In the United States, where emerging adulthood is characterized by a protracted adolescence and gradual engagement in adult tasks and roles, most college students do not rate themselves as having achieved full adulthood (Arnett, 2000), and their parents agree (Nelson et al., 2007). For all students, regardless of generational status, the transition to college presents a number of potential adversities (e.g., moving from home for the first time, heavier academic, and financial demands). Parents play an important role in supporting students during this potentially stressful transition, and for this reason, enacted family support may buffer the effects of life adversity on emotional and physiological indicators of maladaptive stress responding.

There is considerable evidence indicating that social support, such as that offered by families, can serve as a source of resilience (Masten, 2018) and that students with higher perceived support (from multiple sources) are less likely to succumb to the impact of adversity exposure on mental health (perhaps because they appraise adversity as less harmful). For example, young adult caregivers with stronger perceived social support appraise the adversity of caring for a parent with a physical or psychological disability as less intense (Pakenham et al., 2007). Similarly, students in experimental studies assigned to social belonging interventions (which required them to write and talk about the "shared and short-lived" nature of problems in college), demonstrated less emotional reactivity to daily adversity (and better downstream academic achievement and health outcomes; Walton & Cohen, 2011) and higher daily self-esteem, saw adversities as more manageable, and were more confident in their ability to cope with adversities (Walton et al., 2015). Each of these are potential mechanisms by which social support broadly, and family support specifically, might mitigate the pathway between adversity and maladaptive responding.

In contrast to earlier developmental periods, there is relatively less research on the role of parental support in young adulthood, but several recent studies suggest that parent support can be protective during this stage. For example, virtual parent support (delivered via text message) protects college students against adversity. Specifically, texting with a parent buffers college

students against same-day linkages between adversity exposure and less positive and more negative affect (in EMA designs; George, 2017). George (2017) exposed students to social exclusion from a virtual peer and then assigned them to text a parent, text a stranger, or play a solitary computer game (control); findings indicated that those students who reached out to parents (or a stranger) reported less negative affect that day. Parental support buffers against the impact of acculturative adversity on anxiety and depressive symptoms in Mexican American college students (Crockett et al., 2007). Relevant to the present study, those first-year college students with higher reported maternal relationship quality evidence lower cortisol response in the context of daily stressors (Lucas-Thompson, 2014). Similarly, those who received social support had smaller cortisol responses to a lab-based stress induction compared to those who did not (Heinrichs et al., 2003).

Research suggests that parental support is highly valued by first-generation students, especially those from racial/ethnic groups high on familism values (LeBouef & Dworkin, 2021; Van Hell, 2007). Such support can serve as a motivating factor for college persistence (Azmitia et al., 2018; Stephens et al., 2012) and be a potent source of cultural wealth and resilience among first-generation students (Garriott, 2020; Ives & Castillo-Montoya, 2020). On the other hand, some research suggests that familial obligations and lack of parental support for college attendance can serve as barriers for first-generation students (Fuligni, 2007; Jenkins et al., 2013; Phinney & Haas, 2003), that first-generation college students can experience attainment guilt (Covarrubias et al., 2015), and that first-generation college students report receiving less emotional and informational support from parents than do continuing-generation students (LeBouef & Dworkin, 2021; Sy et al., 2011). Thus, parental support is a valuable and culturally-congruent potential target for intervention to reduce disparities among first- and continuing-generation students. Bolstering the parent-child relationship (especially around support for collegiate success) is congruent with Garriott (2020)'s conceptualization of school-family integration as an important element of the social-emotional crossroads first-generation students navigate. Taken together, there is both theoretical support and empirical evidence that enacted family support is likely to moderate the pathway from adversity exposure to maladaptive stress responding, such that this relationship is buffered (attenuated) in those with more family support.

### *Modifiable Risk Factors Suggesting Potential Interventions*

We have proposed a moderated serial mediation conceptual model in which adversity exposure leads to poor academic outcomes by way of the mechanisms of stress responding and behavioral avoidance (Figure 1). Moreover, we have proposed that the pathway from adversity exposure to stress response is moderated such that it is strongest for those high in trait rumination and weakest for those with greater levels of enacted family support. This model suggests several modifiable risk factors and novel University-based interventions targeting these risk factors to interrupt the pathway from adversity to stress response to improve academic outcomes. Interventions disrupting this pathway are likely to be beneficial to all students, but are particularly relevant for first-generation students, who are at greater risk for adversity, low academic performance and school-leaving. Such interventions, though novel, are similar in scope and feasibility to several types of existing university efforts. Existing intervention research supports the likely effectiveness and feasibility of interventions within these areas conducted with college student populations.

### *Decreasing Levels of Ruminative Thinking*

First, given the role of rumination in exacerbating the processes identified here, brief interventions that can reduce rumination among college students are of interest. Mindfulness-based interventions show promise for reducing rumination (Chiesa et al., 2011; Hofmann et al., 2010; Ruiz, 2010) and teach participants to regulate their attention toward the present moment and adopt an orientation of curiosity and acceptance. Mindfulness is a well-supported intervention for internalizing problems (Ruiz, 2010), and rumination is one of the primary mechanisms targeted by mindfulness-based interventions. Interestingly, these interventions also reduce behavioral avoidance (Jay et al., 2016), which is of interest here as well. Research suggests that even very brief reminders to engage in mindfulness can reduce levels of rumination (Hilt & Pollak, 2012), resulting in less worry, anxiety, and distress when confronted with stressors, and thus less maladaptive stress responding.

Critically, rumination has been successfully targeted within college populations using interventions that would be feasible for colleges to deploy. One intervention successfully reduced rumination using both group skill training and internet-based skill training with 251 Dutch adolescents and young adults high in rumination but without current depression or anxiety diagnoses (Topper et al., 2017). This same internet-based training was used to significantly reduce rumination and to reduce risk of depression onset among at-risk UK college students (Cook et al., 2019). Huberty et al. (2019) have demonstrated that use of the mindfulness meditation mobile app “Calm” increased levels of mindfulness (and self-compassion, as well as reducing levels of stress) among college students, suggesting that successfully targeting rumination via mindfulness interventions can be extremely cost-effective in college student populations. Thus, trait rumination represents a promising target for preventive interventions in college students.

### *Bolstering Family Engagement*

Second, qualitative research suggests that first-generation college students remain highly connected to and value support from their families at the transition to college, but that parents of first-generation students may lack knowledge about how to navigate the college environment and thus struggle to support their children’s college success (Bryan & Simmons, 2009). Indeed, research suggests that parents/families may be a particularly potent source of protection and academic motivation for first-generation college students (Stephens et al., 2012). There is evidence that parent-based interventions in adolescence can have effects that endure into late adolescence and early adulthood (Wolchik et al., 2013; Zhou et al., 2008). To date, no studies have investigated the efficacy or effectiveness of parenting-based interventions delivered during young adulthood to reduce college student internalizing and downstream academic problems. Such interventions could emphasize the importance of, and train parents to deliver, developmentally-appropriate emotional and esteem support (which is a component of many evidence-based positive parenting interventions in adolescence; e.g., Gonzales et al., 2012), provide parents with the knowledge necessary for provision of college-focused instrumental/informational support (knowledge which many parents of first-generation students lack; Moschetti & Hudley, 2015), and help avoid students’ experiences of achievement guilt (which may stand as a barrier to college persistence in first generation families; Covarrubias, et al., 2015).

Family support is highly malleable and responsive to interventions, as seen in decades of research on school- and community-based family-focused interventions at the middle and high school transitions (Brody et al., 2004; Molgaard & Spoth, 2001). Although it has typically not been

the focus of retention-focused interventions at colleges, parents have successfully been targeted in interventions intended to lower rates of alcohol abuse among college students (Ichiyama et al., 2009; Mallett et al., 2010). Directly relevant to the current model, in a recent text-message based intervention, parental support was successfully targeted in efforts to increase academic persistence and healthy behaviors among college students (Castleman & Page, 2017; Turrisi et al., 2013). Applying family support interventions such as this to target college retention appears to be a promising opportunity.

### **Countering Behavioral Avoidance**

Third, as reviewed here, behavioral avoidance plays a key role in college student academic challenges, and thus is a prime target for intervention. Colleges often offer support services aimed at increasing student academic engagement (which is certainly negatively related to behavioral avoidance), but there are surprisingly few interventions at the college level which explicitly disrupt behavioral avoidance processes. Some promising examples include brief interventions to teach college students acceptance-based strategies that promote taking action aligned with one's values (Glick & Orsillo, 2015), based on theories from Acceptance and Commitment Therapy (ACT; for a review, see Stockton et al., 2019), as well as in-person and virtual interventions which leverage cognitive-behavioral strategies to reduce behavioral avoidance including procrastination (Dryden, 2012; Karas & Spada, 2009; Pychyl & Flett, 2012). For example, a smartphone-based intervention using an app effectively reduced procrastination behaviors relative to a waitlist control condition in an adult sample (Lukas & Berking, 2018). Also encouraging is initial research suggesting that the evidence-based principles from the Unified Protocol for Treatment of Emotional Disorders (which considers behavioral and emotion avoidance a treatment target relevant to the full array of depressive and anxiety disorders) can be effectively translated into group and prevention contexts (Osma et al., 2018). Specifically, this intervention teaches several skill-based strategies to reduce behavioral avoidance.

However, to our knowledge, no interventions to date have targeted the role of behavioral avoidance in academic outcomes. Promisingly though, interventions focused on related constructs have been developed and applied within college settings with considerable success. For example, Otermin-Cristeta, & Hautzinger (2108) successfully reduced levels of one form of behavioral avoidance, procrastination, among college students by having them attend workshops that applied cognitive behavioral principles to reduce the target behavior. Taken together, of the three malleable factors reviewed here, perhaps the most work remains to be done on behavioral avoidance interventions before they can be demonstrated to be effective with college students targeting academic outcomes using methods that are scalable and feasible for universities to deploy.

### *Future Directions*

Several key gaps in the available research base should be addressed in future research. Although the individual pathways in the model we propose are consistent with the available empirical evidence and with theory, empirical evaluation of the overall model (including the proposed mediational pathways) will be critical to identifying optimal interventions focused on increasing academic performance and decreasing school-leaving. We also identified several individual pathways within our proposed model for which the evidence base is relatively limited. First, the extent to which adversity provokes anxiety disorders and symptoms, and the types of adversity

that do so, is not nearly as well established as the evidence base linking adversity to depression. Second, although theoretically indicated, it is not well established that dysregulated physiological stress responding is a strong predictor of later behavioral avoidance, whether broadly conceptualized or specific to academic contexts. Third, while there is substantial research linking ANS reactivity with academic problems among younger children, research linking ANS reactivity and academic performance among college students is relatively lacking. Finally, it is not yet clear what behaviors constitute effective supportive parenting in emerging adulthood. Most work has been conducted with adolescents, and there is much less research on developmentally appropriate parenting for college-enrolled students. Future work should investigate how parents can best balance social support, support for autonomy, and accountability and encouragement for behavioral engagement as potentially beneficial parenting behaviors in emerging adulthood.

### *Limitations*

The present model, while novel, is not without limitations. First, it does not capture the full array of maladaptive stress responses. Specifically, externalizing behavior, including increases in substance misuse and behaviors that violate the rights of others (antisocial behaviors), are also likely to increase in the face of adversity. We have not addressed externalizing problems in the present model to preserve the model's specificity, and this remains an area for further development. Second, we focus here primarily on individual and family-level risk and protective factors (which have been under-studied in the literature among college students to date) and do not attend to university-level barriers nor supports (e.g., academic support services and student counseling resources) that target proposed mediators (e.g., behavioral avoidance) and are an important resource available to college students.

### **Conclusion**

To promote the academic success of college students, we advocate mining under-utilized psychological principles to develop conceptual models highlighting modifiable risk factors and novel interventions for future validation. Specifically, we propose a novel model in which greater adversity exposure acts on poorer academic outcomes via stress responses (indicated at both the emotional and physiological levels) and behavioral avoidance. Further, we propose that the links between adversity exposure and stress response are likely intensified by ruminative thinking and buffered by enacted family support. We posit that this model is likely applicable to all college students, but that it might be particularly applicable to first-generation students due to their increased levels of adversity exposure. This model suggests the need for interventions tailored to focus on reducing levels of ruminative thinking (including mindfulness skills), bolstering family support behaviors during college enrollment (perhaps through caregiver-focused training and resources offered during orientations for first year students and online), and reducing academic behavioral avoidance (using Acceptance and Commitment Therapy-inspired strategies). Such efforts have the potential to dramatically reduce levels of college non-completion, shifting students' life trajectories in positive and important ways.

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**Suzanne Vrshek-Schallhorn**, Ph.D., is a licensed Clinical Psychologist, Associate Professor and Undergraduate Program Director in the Department of Psychology at the University of North Carolina at Greensboro. Her work probes pathways from life stress to depression, using the lenses of stress interviews, stress measure development, molecular genetics, HPA-axis diurnal rhythm and reactivity, trait vulnerabilities, and discrimination as a stressor. She is increasingly interested in the role of stress on first-generation student mental health and college persistence.