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TESTING THE EFFECT OF STRESS ON EXTERNALIZING BEHAVIORS: IS
GROWTH MINDSET A MODERATOR?

by

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Abstract

This study aimed to examine the potential buffering role of growth mindset of thoughts, emotions, and behaviors in reducing adolescents' externalizing behaviors in the context of normative stress (i.e., family, peer, academic, overall) during adolescence. Moderation analyses conducted in the PROCESS macro for SPSS revealed that family stress was significantly associated with externalizing behaviors in adolescents, and this relation was moderated by growth mindset of thoughts, emotions, and behaviors. The conditional effect analyses revealed that the magnitude of the association between family stress and externalizing behaviors weakened as the levels of growth mindset increased. Academic stress, peer stress, and overall stress models did not significantly interact with growth mindset to predict externalizing behaviors. Taken together, the findings suggested that growth mindset demonstrates protective effects in reducing externalizing behaviors when adolescents experience family stress. Implications are discussed.

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Testing the Effect of Stress on Externalizing Behaviors: Is Growth Mindset a Moderator?

Introduction

Historically, the focus of psychological research and practice has been on gaining better understandings of pathologies and remediating the deficits of human functioning (Seligman & Csikszentmihalyi, 2000). However, what has been largely neglected is optimal functioning in humans and how to promote optimal functioning beyond deficit remediation. Since the rise of the field of positive psychology in the 21st century, more attention has been given to building and nurturing positive qualities and strengths in people, which does not contradict to remediating deficits but can add on a preventive approach to mitigate negative outcomes often stemming from life adversities (Seligman & Csikszentmihalyi, 2000). One positive quality that has gained emerging research attention in recent decades is growth mindset, which is rooted in implicit theories (Dweck & Leggett, 1988; Dweck, 1999). The literature on implicit theories has indicated that growth mindset of intelligence is one crucial antecedent factor that predicts better academic achievement (Claro et al., 2016), however, there is still much to learn about the role of implicit theories (or mindsets) in the area of social-emotional functioning (Blackwell et al., 2007). To bridge these research gaps, this study aims to investigate whether holding more growth mindset of thoughts, emotions, and behaviors will buffer the adverse effects of various life stressors in adolescents to reduce externalizing problems. The literature bases for the current constructs of interest are reviewed in detail below.

Normative Stress during Adolescent Development

Normative Stress during Adolescence. Adolescence is defined as the age range between 10 years old and 19 years old (World Health Organization, 2015). Adolescence is a unique

developmental period due to a host of sources of changes, which include, but are not limited to, pubertal changes (e.g., changes in hormones, physical growth), cognitive and psychological changes (e.g., need for more social autonomy, search for identity), and adjustments in school and social contexts (e.g., academic pressures, peer problems, family conflict) (Anderson et al., 2014; Byrne et al., 2007; Eccles, 1999; Grant et al., 2006; Lau, 2002). Most stressors above are normative stressors because they describe frequent stressors that occur in almost all adolescents in some aspect, regardless of gender, race, ethnicity, region, or socioeconomic status. Though largely these changes are part of normal development, when such stress evaluates and accumulates but adolescents do not have sufficient coping resources, it increases the risk of impaired functioning and psychopathological symptoms (Byrne et al., 2007; Grant et al., 2006). For example, a meta-analysis found positive correlations between stress (significant life stress and normative stress combined) and psychopathology in adolescents (March-Llanes et al., 2017). Also, it has been noted that compared to significant life events, maladjustment to normative stress tends to provide a better indication of individuals' overall adjustment (DeLongis et al., 1982; Felsten, 2002). Thus, understanding how normative stressors affect adolescent behaviors and its possible mechanism is crucial to identify what factors could protect adolescents when they cope with such stress.

The negative association between chronic, normative stress and adolescents' well-being has been consistently reported in the literature. For instance, family, school, and peer stressors were found to be associated with increased distress and anxiety (Kiang & Buchanan, 2014) and decreased life satisfaction (Kiang & Buchanan, 2014; Moksnes & Haugan, 2015). Researchers also found that normative stress (e.g., daily hassles) was positively correlated with problem behaviors (Elgar et al., 2003), and school stress (i.e., both academic and peer stress) was

associated with increased maladaptive problem behaviors (Cumming et al., 2019). Other school stressors, such as changing schools, were found to be predictive of externalizing behaviors in adolescence (Weeland et al., 2019). Three major types of normative stressors for adolescents, including, academic stress, family stress, and peer stress, are reviewed below.

Academic Stress. Academic stress could encompass academic pressures from test performance, teacher perception or conflict, and studying for schoolwork. There is a trend of increasing perceived academic stress one progresses through in middle school. For example, Swiss researchers Giota and Gustafsson (2016) found that 6th grade students already experienced high levels of academic demands and related stress, and these demands and stress continued to increase into the 9th grade. In a quantitative study with a sample of Australian 12th graders, students rated that school-related stressors, such as exams, having too much work to do, and career choices, were the main sources of their stress (Kouzma & Kennedy, 2004). Similarly, in a qualitative study, adolescent participants aged 12 to 19 years old reported school demands, such as passing classes, maintaining good grades, and getting into college, were the most frequently reported academic stressors (LaRue & Herrman, 2008). In another qualitative study, some gender differences in perceived academic stress were identified among adolescents who were aged 14 to 15 years old. For females, the most important themes were the future and pressure to achieve better grades. In contrast, male students were more likely to prioritize fun activities rather than school demands and were more relaxed about school and the future (Wilhsson et al., 2017).

Academic stress was found to be associated with a variety of adolescent well-being indicators, such as lower life satisfaction, in a Swiss study (Burger & Samuel, 2017), school burnout in a Turkish study (Sarıçam et al., 2017), increased depressive symptoms in a

Norwegian study (Undheim & Sund, 2005), and more internalizing and externalizing behaviors (Bjorkman, 2007). Despite the knowledge of the general negative effect of academic stress on adolescent well-being, findings regarding the direct association between academic stress and externalizing problems in adolescence are very limited.

Social Stress- Peer. The importance of peer relationships become more significant as children grow into adolescence. Adolescents tend to spend more time with peers than family, and the problems surrounding friends or lack thereof, tend to be especially salient to this age group. Adolescents are more likely to seek out peer support for school problems, conflict with other peers, and romantic relationship problems (Cicognani, 2011). Indeed, although peers can help adolescents cope with stress, they can also be the source of stress (Camara et al., 2014). Peer stress manifests in a variety of forms. Mild peer problems may include not fitting in, disagreements with peers, being teased due to physical looks, and competitiveness regarding material items, grades, or sports (Byrne et al., 2007; Lau, 2002). More severe peer problems may include peer isolation, rejection, and being bullied.

In general, peer stressors were associated with internalizing and externalizing problems in adolescents (Bakker et al., 2010; Hazel et al., 2014; Moksnes et al., 2016). Clique-isolation, or not being a part of a friend group, was found to be associated with depressive symptoms in early adolescence (Witvliet et al., 2010). Also, peer rejection predicted externalizing behaviors such as aggression and rule-breaking behavior in 9th graders (Janssens et al., 2017). In addition, middle schoolers with prior behavior problems were found to have escalated behavior problems when they experienced peer stress (Cumming et al., 2019). Hence, heightened stress in peer groups increases the risk of more risky behaviors and mental health problems in adolescents.

Social Stress - Family. Family stress refers to stress within the adolescent's home which commonly encompasses arguments or disagreements in the home, behavioral or mental issues of parents, a lack of trust from parents, or a feeling of not having enough control. Based on data from eighteen different countries, researchers found that adolescents reported stress due to family problems to be more stressful than problems with peers (Persike & Seiffge-Krenke, 2016). Major family stress usually comes from family instability and poor family functioning. Family instability during childhood was found to be associated with both internalizing and externalizing problems in adolescence (Bakker et al., 2012). Also, poor family functioning was consistently found to be associated with increased psychological maladjustment and externalizing and internalizing behaviors in adolescence (Francisco et al., 2015; Henderson et al., 2006). Cumulative family risk factors, such as marital hostility and parenting harshness, were found to be associated with internalizing problems for 6th grade girls and externalizing problems for 6th grade boys (Buehler & Gerard, 2013). In studies that used specific internalizing or externalizing problems as the outcomes to investigate the adverse effects of family stress, results have shown that family stress was associated with decreased life satisfaction (Chappel et al., 2014), decreased school engagement (Voisin et al., 2016), depressive symptoms (Jones et al., 2001; Low et al., 2012), and a range of externalizing behavioral problems, such as delinquent behaviors, substance use, risky sexual behaviors, and antisocial behaviors (Deković et al., 2003; Low et al., 2012; Voisin et al., 2016). In addition, increased parent stress, which often results in higher stress in children, was also associated with delinquent behaviors in a sample of Black adolescents (Voisin et al., 2018).

Externalizing Behaviors in Adolescents

Externalizing behaviors describe a set of outward, usually disruptive, behaviors that can be observed by others, including but not limited to aggression, hyperactivity, oppositionality, and impulsivity (Boeldt et al., 2012; Yong et al., 2013). Externalizing behaviors in children and adolescents often indicate significant maladjustment problems and are predictive of negative outcomes. For example, young adolescents displaying externalizing symptoms tend to perform poorly in school, display disruptive behavior, and have poor social relationships (Kauffman & Landrum, 2013). Externalizing behaviors may lead to significant consequences in youth development if they evolve into more severe forms and meet the diagnostic criteria for externalizing disorders, such as Oppositional Defiant Disorder and Conduct Disorder (Loeber & Burke, 2011). Moreover, externalizing problems in adolescence predict both externalizing disorders and internalizing disorders into adulthood (Reef et al., 2011; van der Ende et al., 2020), and criminal behavior in young adulthood (Aebi et al., 2014). Taken together, the consequences of youth externalizing behaviors may pose serious problems to individuals, families, schools, and society as a whole. Thus, it is crucial to address externalizing problems in young people in preventive ways to reduce the risk of further escalation. To better understand how externalizing problems affect adolescent development, the relations between demographic factors and such problems are reviewed next.

Age and developmental stages. A theory of developmental trajectories of delinquency is helpful to describe the occurrence and changes of severe externalizing behaviors during adolescence and across the life span. Moffitt (1993) theorized that there is a life-course persistent pattern where conduct problems occur throughout childhood, adolescence, and adulthood. The other trajectory is adolescence-limited where conduct problems occur mostly in adolescence and

usually do not continue into adulthood. According to Moffitt (1993), an early onset of conduct problems may be due to neurodevelopmental deficits, insufficient parenting, and negative social influences during childhood which have fundamental influence on later development, while adolescent-onset may occur mainly due to influence from peers, which tends to be temporary.

Empirically, the effects of age and developmental stages on externalizing problems have been mixed and inconclusive. In a short-term longitudinal study, researchers found that externalizing behaviors were moderately stable over one year in early adolescents (Leadbetter et al., 1999). For late adolescents, research has shown mixed findings that externalizing problems either persist into adulthood or are only stable within adolescence (Moffitt, 1993; Odgers et al., 2008). The trajectories of externalizing behaviors seem to vary depending on the types of behaviors. For instance, for individuals with clinically significant levels of attention and/or hyperactivity/impulsivity problems and had a childhood diagnosis of Attention-Deficit/Hyperactivity Disorder, or ADHD, it was found that 70% of them maintained the symptoms in adulthood (Caye et al., 2016). Thus, less severe externalizing problems, such as ADHD symptoms, appears to follow a life-course persistent trajectory as Moffitt (1993) theorized. When the focus was on more outward behaviors such as aggression and delinquency, researchers found that aggressive behaviors decreased throughout childhood and adolescence while delinquent behaviors displayed an upward curvilinear increase from age four to eighteen (Bongers et al., 2003).

Though empirical studies showed varying findings and did not indicate a clear pattern of how externalizing behaviors develop across adolescence or a more extended life span, it is clear late adolescence is among the key developmental group to study externalizing behaviors whether they emerge in childhood or adolescence.

Gender. Gender differences in rates of externalizing behaviors have been consistently found in the literature. Many studies have reported that overall, boys are more likely to display externalizing behaviors than girls (Chaplin & Aldao, 2013; Karreman et al., 2009; Leadbeater, et al., 1999). More specific externalizing behaviors, such as aggression, delinquency, and hyperactivity, are all more common in boys than girls (Cantwell, 1996; Liu, 2004), though girls with ADHD showed much less frequent and severe disruptive and rule-breaking behaviors in classrooms (Abikoff et al., 2002). When taking ages into consideration, both boys' and girls' delinquent behaviors tended to increase in early adolescence (from 6th to 7th grade, Leadbeater et al., 1999). Gender differences in the developmental trajectories of delinquency across a wider life span are less clear. Built upon Moffitt's (1993) theory, existing findings seemed to suggest no gender differences for the adolescent-onset delinquency, though males are more likely to be on the childhood-onset trajectory of delinquency and aggression (Moffitt & Caspi, 2001; Xie et al., 2011).

Races and ethnicities. Regarding externalizing behaviors across races and ethnicities, research has suggested that Black youth are more likely to engage in violent or delinquent behavior (Daughters et al., 2009). It has also been documented that Black adolescent males reported higher levels of aggression (Lansford et al., 2006; McLaughlin et al., 2007), while there were no aggression differences between races for females but a significant gender and race interaction for Black males (McLaughlin et al., 2007). In another study, researchers reported that both Black and White children had a higher prevalence of ADHD symptoms than Hispanic children, though there was no significant difference between Black and White children (Cuffe et al., 2005). Similarly, a study of elementary school aged children did not find differences in ADHD diagnosis prevalence between Black and White children (Rowland et al., 2002).

Generally speaking, externalizing problems have shown differences across ages, gender and race/ethnicity groups, though the differences have been inconclusive depending on the types of externalizing problems. Therefore, the current study will treat age, race, and gender as covariates.

Adolescent Normative Stress and Externalizing Problems

Normative stress was found to contribute to the development of externalizing problems in adolescents, such as delinquency (Kim et al., 2003; Leadbetter et al., 1999), non-suicidal self-injury, and risky decision-making (Calvete et al., 2017; Galván & McGlennen, 2012). Specific stressors, discussed above, were also associated with externalizing problems. For example, general family stress, stressful family events such as moving, and parent-child conflict predicted adolescent externalizing behaviors (Gunlicks-Stoessel & Powers, 2008; Li et al., 2019; Little et al., 2019; Schermerhorn et al., 2013; Steeger et al., 2017). Outside family-related stress, academic stress and peer stress were found to be positively related to externalizing problems in adolescents (Bjorkman, 2007). For peer stress, peer victimization is a significant predictor of aggression (Herts et al., 2012), and boys were more likely to exhibit aggression or disruptive behaviors in response to social stress (Bierman & Welsh, 1997).

Taken together, evidence consistently suggested that stress increases the risk of externalizing problems such as aggression and delinquency in adolescents. When adolescents experience heightened levels of stress and do not have effective coping resources, they are at high risk of displaying externalizing behaviors, and externalizing behaviors may become part of maladaptive coping behaviors that lead to a downward spiral in stress coping. Thus, there is the need for understanding factors that help adolescents mitigate the stress and build strengths, to

prevent problematic externalizing behaviors. The next section reviews key concepts in adolescent stress-coping and a potential protective factor in this process, growth mindset.

Protective Factors to Cope with Stress

Coping Responses to Stress. Coping is defined as the transactional processes through which individuals overcome problems in their lives (Skinner & Zimmer-Gembeck, 2007). Problems may refer to more significant or serious situations or daily stressors or situations. Two major styles of coping are problem-focused and emotion-focused coping. Problem-focused coping refers to attempts that directly confront the stressor, while emotion-focused coping mainly includes emotional responses or management of emotional responses such as venting (Zimmer-Gembeck & Skinner, 2016). Problem-focused coping strategies become more common in adolescence than they were in childhood (Zimmer-Gembeck & Skinner, 2011). In general, problem-focused coping is more adaptive, as it positively predicted well-being and greater positive functioning across youth (Zimmer-Gembeck & Skinner, 2008) and adults (Mayordomo-Rodríguez et al., 2015). However, based on a meta-analytic study, problem-focused coping had small negative associations with internalizing symptoms (Compas et al., 2017), suggesting that problem-focused coping may be effective to address the stressful situation but not be adequate to solve or prevent internalizing problems for adolescents. The findings of the relation between emotion-focused coping and well-being are less straightforward, as some studies reported the negative association for young adults (Mayordomo-Rodríguez et al., 2015) while others found emotion-focused coping contributed to fewer adjustment problems in adolescence (Hampel & Petermann, 2006). Overall, problem-focused coping leads to more adaptive functioning compared to emotion-focused coping, though emotion-focused coping can be beneficial in some occasions.

In addition, different types of stressors or situations might call for the use of different coping strategies within broad types of coping and there are benefits to using a range of coping strategies (Zimmer-Gembeck & Skinner, 2016). Compared to children, adolescents tend to use a greater variety of coping strategies and have more flexibility in using different coping strategies (Skinner & Zimmer-Gembeck, 2007). Based on extant literature, using coping strategies effectively would not only address the current stressful situation, but also could build individuals' resiliency and reduce the risk for future maladaptive responses. Then one key question is, what can facilitate adolescents' utilization of more adaptive coping when facing stress? Drawn from positive psychology and resilience literature, some psychological strengths help maintain cognitive and behavioral functioning under stress and therefore are the candidates of the protective factors in adolescents' coping process (Seligman & Csikszentmihalyi, 2000).

Psychological strengths as protective factors. Overall, there have been only a few studies examining the protective factors for reducing mental health problems in the context of stress during adolescence. First of all, self-esteem, a well-studied construct, was noted to be a protective factor in the relation between normative stress and externalizing behaviors among adolescents (de Moor et al., 2019). Secondly, self-compassion, a psychological strength defined as treating oneself with warmth and care through stressful times, has been found to protect against the effect of stress on internalizing behaviors in adolescents (Lathren et al., 2019). Thirdly, personal growth initiative, a construct defined as an intentional and willful self-change method to complete a task, has been found to weaken the negative relation between stress and mental health among adolescents in a Pakistani study (Zaman & Naqvi, 2018). Though limited in the number of studies, these findings showed the promise that psychological strengths are beneficial to weakening negative mental health impacts from stress.

Beyond these recent advancements in positive youth development literature, another psychological strength that has gained increasing research attention is growth mindset. Growth mindsets might be an important catalyst factor during adolescents' coping process and have the similar buffering function as self-compassion or personal growth initiative, but this has not been tested empirically. The current literature regarding growth mindset is described below.

Growth Mindset Theory

Implicit theories are core assumptions that an individual has about the malleability of their personal qualities (Dweck & Leggett, 1988). Implicit theories are broken down into two opposing categories on a continuum, entity theories and incremental theories. Entity theory is the belief that characteristics are fixed or unchangeable. While, incremental theory is the belief that personal qualities can be developed or grown, hence the phrase growth mindset. Individuals who endorse an incremental theory mindset are more likely to focus on learning to increase their abilities than performance or verifying their abilities (Dweck & Leggett, 1988). These theories were initially developed for intelligence; however, they have been used with many other qualities as well including but not limited to criminal behavior, relationships, empathy, and academic achievement (Dweck, 2006; Gandhi et al., 2017; Knee, 1998; Rade et al., 2018). It should also be noted that an individual can have an entity theory for one characteristic and an incremental theory for another.

Growth Mindset of Intelligence. Early research in implicit theories illustrated the difference in children's motivation based on their theoretical view of intelligence. Children who accepted an incremental theory of intelligence were more likely to prefer tasks that were novel and more difficult so they could learn something (Bandura & Dweck, 1985). Whereas children who endorsed an entity theory were more likely to seek tasks that were perceived as fun and easy

as to not worry about making mistakes. Children with growth mindsets exert more effort to overcome their problems and display greater academic achievement (Blackwell et al., 2007; Dweck & Leggett, 1988). Dweck (2007) posits that mindsets develop through types of praise in childhood. Growth mindsets are developed through praise for effort and persistence while fixed mindsets are developed through praise for intellect and abilities. It has also been reported that females might be more likely to endorse fixed mindsets due to this pattern and difference of praise that starts in infancy (Dweck & Simmons, 2014). When an individual has a growth mindset, it has led to higher academic achievement compared to those with fixed mindsets (Blackwell et al., 2007; Dweck, 2008). An intervention with undergraduate students to believe their intelligence is malleable was beneficial even in the face of stereotype threat (Aronson et al., 2001). The stereotype threat referred to in this study is that African Americans are intellectually inferior to their White counterparts. Specifically, African American students in the intervention group reported valuing and enjoying academics more and making better grades. Since the initial growth mindset studies investigating intelligence, other ideas of mindsets have been introduced.

Growth Mindset of Personality. Entity theories of personality are the beliefs that personality characteristics are fixed, while incremental theories are the idea that personality characteristics are malleable. Adolescent entity theorists reacted more negatively toward social exclusion (Yeager et al., 2014; Yeager & Dweck, 2012). When entity theorists were manipulated and shifted to having incremental theory beliefs, the social exclusion stress response was significantly less. Incremental theorists might think of problems such as social stress as an opportunity for improvement rather than a lasting deficit. Yeager & Dweck (2012) found that adolescents who endorsed fixed mindsets regarding social status were more likely to feel shame and vengeful after recalling peer conflicts and after hypothetical peer victimizations (Yeager et

al., 2013). These adolescents with fixed mindsets believed that the “bullies” were unchangeable. Along with negative social effects, implicit theories of personality have also been studied regarding mental health problems. According to a meta-analysis, entity theories of personality were positively associated with internalizing and externalizing problems in youth (Schleider et al., 2015).

Growth Mindset of Emotion Related Constructs. There were many relevant findings that stemmed from the initial implicit theory studies, so other mindset ideas, such as mindsets of emotion, have emerged to determine whether they follow similar trajectories. Mindset regarding emotions has been researched through several different studies (De Castella et al., 2013; Kneeland et al., 2016; Tamir et al., 2007). Growth mindset on emotion posits that an individual does not have much control over the emotions they experience (entity theory) or that people can learn to regulate their emotions (incremental theory). Undergraduates who endorsed more entity beliefs about their own emotions, rather than in general, was associated with less reappraisal, decreased self-esteem and life satisfaction, and increased stress and depression (De Castella et al., 2013). This finding supports the implication that just because a person believes other’s emotions are fixed, does not necessarily mean they believe their own are not malleable. Emotion entity theorists also experienced more negative emotions and less positive emotions during the transition to college (Tamir et al., 2007). These individuals also had unfavorable outcomes over the course of their freshman year of college including lower well-being, more depression, more loneliness, and worse social adjustment. In another study of college students, entity theories of emotions were positively associated with stress and depression and negatively associated with self-esteem and satisfaction (De Castella, 2017). Due to past research, it is expected that

incremental theories might affect the way individuals perceive a stressful situation and cope with those associated emotions (Kneeland et al., 2016).

The growth mindset of more narrowly defined emotion, such as anxiety, is a somewhat new construct and has very few studies to date, all with college student samples. Schroder et al. (2017) measured whether a growth mindset of anxiety moderated life challenges and adjustment using midwestern undergraduates that were majority White. Life challenges were defined by significant life events and adjustment was defined by PTSD, depressive symptoms, and maladaptive coping strategies such as alcohol abuse, drug use, and non-suicidal self-injury. Findings indicated that those with a fixed mindset of anxiety had a stronger correlation between having a history of significant life events with maladjustment and maladaptive coping strategies. Whereas having a growth mindset was negatively correlated with adversities (PTSD, depressive symptoms, alcohol abuse, drug use, and non-suicidal self-injury) and significant life events. Fixed mindsets of anxiety were predictive over time of psychological distress compared to individuals with growth mindsets (Schroder et al., 2019). Growth mindset of another kind of emotion, empathy, was found to be associated with greater empathic effort, meaning individuals are more willing to take time to listen, take another's perspective, and try to feel other's emotional states (Schumann et al., 2014). In a sample of undergraduates, empathy growth mindset was negatively associated with social and physical aggression (Gandhi et al., 2017). It was also found that growth mindset of empathy moderated dispositional empathy and social aggression.

Growth mindset on thoughts, emotions, and behaviors. A newly emerging area of implicit theory research focuses on constructs closely associated with mental health, including thoughts, emotions, and behaviors. Entity theorists, or those who hold a fixed mindset, believe

that their thoughts, emotions, and behaviors cannot be changed (Schleider & Weisz, 2016b). Fixed mindsets regarding this construct were associated with increased mental health problems in a sample of early adolescents in grades six through eight (Schleider & Weisz, 2016a). In Schleider and Weisz's (2016a) study, fixed mindsets were not found to predict mental health problems overtime, however initial internalizing problems did predict fixed mindsets. Another study conducted by the same researchers found that, overall, girls in 6th through 8th grade endorsed stronger fixed mindsets of thoughts, feelings, and behaviors than boys. It was also found that entity theories were associated with mental health problems more in girls than boys (Schleider & Weisz, 2016b). Overall, the research regarding implicit theories of thoughts, emotions, and behavior is promising and needs more investigation. Taken together, mindset research is generally supportive that growth mindset is beneficial and fixed mindset is harmful to individuals, though most of these studies focused on adults. Studies below illustrate the importance of using growth mindset as an intervention or protective factor to reduce psychopathology.

Growth mindset intervention and mental health outcomes. Besides the observation studies, the effects of growth mindsets on mental health have been studied through intervention research (Miu & Yeager, 2015; Schleider & Weisz, 2016c; Schleider & Weisz, 2018; Schleider et al., 2019). In one study conducted by Miu and Yeager (2015), researchers designed a one-time intervention on incremental theories of personality, including three replications, with high school students as the participants. The intervention presented an article outlining incremental theory and its evidence, reading quotes from older peers endorsing incremental theories, and guided the participants to write their own summaries on growth mindset in this domain. Intervention took place in math class and participants were from both affluent schools and lower performing, low-

socioeconomic schools. Results showed that the intervention group had reduced levels of depressive symptoms compared to the control group. Also, adolescents in the control group with a more fixed mindset had increased depressive symptoms compared to those with growth mindsets in the control group (Miu & Yeager, 2015).

Schleider & Weisz (2016c) tested how a one single-session computer-based intervention on growth mindset affects perceived control and physiological distress among a sample of adolescents aged 12 to 15 years old with prior anxiety or depressive symptoms. The intervention first presented information about brain plasticity, testimonials and personal stories from high school adolescents about trait malleability, common questions and myths about mindset, and a hypothetical situation, and then required the participants to imagine they were in the situation compared to someone else (Schleider & Weisz, 2016c). This intervention was effective in that the participants who received the intervention reported improved primary and secondary perceived control than a comparison control group. That is, participants reported improved ability to influence objective situations and improved ability to manage their psychological impact in the face of an objective situation. These participants also recovered more than three times as quickly than the control group from an induced social stressor task in a lab setting. Another study evaluated the same intervention in a lab setting with adolescents aged 12 to 15 who had anxiety or depression, in which participants who received the intervention reported decreased depression, anxiety, and improvements in primary control through a 9-month follow-up (Schleider & Weisz, 2018). These single session, computer-based interventions showed that adolescents maintained reductions in internalizing symptoms both in the short-term and relatively long-term (9 months) (Schleider & Weisz, 2018).

Another computerized growth-mindset intervention analyzed whether the intervention would reduce not only depression and social anxiety but conduct problems as well in a sample of rural, female adolescents aged 14 to 17 years old (Schleider et al., 2019). The computerized growth-mindset intervention (Growing Minds) was used in a classroom setting, lasted 45 minutes, and included mindsets related to personality, intelligence, and self-regulation. The intervention demonstrated scientific evidence for growth mindsets, presented college-aged individuals' discussion about how to employ growth mindsets for coping, and required a writing exercise to internalize growth mindset thinking, as well as quizzes with feedback. The intervention led to decreased depressive symptoms self-reported by the adolescents compared to the control group, though no improvements in social anxiety or conduct problems. Overall, these intervention studies suggested that mindset can be changed, and growth mindset is beneficial to improve adolescent's mental health.

Growth mindset as a moderator. A protective factor, or moderator, is a variable that weakens the relation between two constructs to reduce adverse consequences. Several studies tested the moderation function of growth mindsets (Jach et al., 2018; Jiang et al., 2019; Park et al., 2018; Schroder et al., 2017). For instance, for 8th graders, a stress-is-enhancing mindset (i.e., viewing stress as beneficial for individuals to improve health, performance, and well-being, Crum et al., 2014) was found to moderate the relation between adverse life events (e.g., increased arguments with parents and problems with a close friend) and perceived distress (Park et al., 2018). Similarly, a stress-is-enhancing mindset was found to moderate the association between stressful life events and depression in a sample of 10 to 14-year-old youth in China (Jiang et al., 2019). Also, Schroder et al. (2017) found that growth mindset of anxiety significantly moderated the impact of significant life events on maladaptive coping strategies

including depressive symptoms, drug use, PTSD, and non-suicidal self-injury, in a sample of undergraduate students. The effectiveness of the growth mindset interventions is also indicative of the protective role of growth mindset in adolescents' mental health, which supports the moderation effect of growth mindset from another angle (Miu & Yeager, 2015; Schleider & Weisz, 2018). However, it is unknown if the moderating effects of growth mindset would exist in the context of normative stress. Taken together, previous moderation and intervention studies set the foundation for the current study to investigate the protective role of growth mindset in the relation between normative stress and externalizing behaviors among adolescents.

Research Gaps. There has been an abundance of growth mindset research in the past few decades, especially in the areas of intelligence and personality. For example, early growth mindset research has shown how beliefs about intelligence affect academics and motivation (e.g., Blackwell et al., 2007; Dweck, 2008; Dweck & Leggett, 1988) and fixed mindsets of personality were related to negative behavioral outcomes (Schleider et al., 2015; Schleider & Weisz, 2016b). However, there is much less research in other areas of mindsets, such as the mindsets that directly affect mental health. Also, besides the direct correlation between growth mindsets and consequences such as mental health, the buffering effect of growth mindsets in the context of stress still awaits to be tested. Though research has revealed that growth mindset in some domains (e.g., stress or anxiety) has protective effects against mental health problems such as depression (Jiang et al., 2019; Park et al., 2018; Schroder et al., 2017), little is known about if growth mindset can buffer against various stressors to reduce externalizing problems among adolescents. To bridge these gaps in research, the current study will investigate growth mindset that focuses on implicit theories of thoughts, emotions, and behavior, to test its buffering effect

in the relation between normative stressors and externalizing behaviors in a sample of diverse high school students.

The Current Study

Externalizing problems are indicators of poor adjustment, associated with other problems (e.g., internalizing problems, poor social relationships, and poor school performance), and predictive of a range of more severe problems (e.g., criminality and antisocial personality disorder, Kauffman & Landrum, 2013; Kuja-Halkola et al., 2015; Liu, 2004; Loeber et al., 2002; van der Ende et al., 2020). Adolescents who experience adverse, elevated, and chronic stress in life are at higher risk of developing externalizing problems (Calvete et al., 2017; Steeger et al., 2017). Research has shown that family stress is more frequently reported than academic and peer stress among adolescents (Byrne et al., 2007; Persike & Seiffge-Krenke, 2016). It is possible family, peer, and academic stress influence adolescents' behavioral outcomes in different ways. Thus, in this study each type of stressor was taken as a predictor in separate models. The protective mechanism to reduce externalizing problems for stressed adolescents has been overlooked in the literature. Based on recent studies, both observation and intervention studies on different domains of growth mindset have shown that growth mindset has a positive effect in reducing psychopathology and mitigating the association between stress and maladaptive coping strategies (Park et al., 2018; Schleider & Weisz, 2018; Schroder et al., 2017). It is plausible that growth mindset in the area of mental health also can protect adolescents who experience normative stress from developing externalizing behaviors. Thus, the primary research questions for the current study are if growth mindsets of thoughts, emotion, and behavior moderate the association between three types of normative stressors, respectively, and externalizing problems in adolescents. The stressors include academic stress, family stress, peer stress, and overall

stress. See Figure 1 in the Appendix for the conceptual model. It is hypothesized that (1) growth mindset interacts with each stressor to predict externalizing behaviors, and specifically, (2) as growth mindset levels go up, the association between stress and externalizing behaviors would weaken. In other words, the buffering effect of growth mindset is significant. The role of growth mindset across models with different types of stress is an exploratory question and no specific hypotheses are postulated.

Methods

Participants

Participants of the current study were students at a public high school from a city in the mid-south region of the United States. There was a total of 399 participants who were in grades nine through twelve and ranged in age from 14 to 18 ($M = 16.22$, $SD = 1.21$). There were 141 9th grade students, 77 students in 10th grade, 93 students in 11th grade, and 87 12th graders. The majority of participants were female (56.4%) and 42.3% male while 1.3% identified as gender-nonconforming or gender variant. Most participants reported living with a set of two parents (70.4%), and most had a range of zero to three siblings living in their home (92.1%). There were a variety of parental education levels obtained with the highest being a graduate degree (26.1%), and an undergraduate degree (26.1%), followed by high school (18%), professional school (14.5%), and middle school (4.5%). More than a third of the sample identified as Black (35.1%), while other racial/ ethnic groups reported were Asian American (10.8%), White (29.3%), Hispanic or Latinx (12.3%), and Biracial or Multiracial (9.5%). Other racial/ethnic groups reported were Native American and Middle Eastern (1%).

Procedure

The current study was a part of a larger study that investigates psychological strengths in youth approved through the Institutional Review Board at the University of Memphis. The data were collected via a paper-and-pencil format in January 2020 (before the COVID-19 pandemic began in the United States). Students were given parental consent to take home. For those who brought back the signed parental consent, they were given the measures to fill out in their first period class. Student assent was shown on the front page of the survey. It took approximately 30 minutes to complete the survey. The survey was anonymous, and students were instructed to participate on a voluntary basis. Homeroom teachers who gave the administration instructions followed a standard script and the whole administration process was facilitated by graduate research assistants as needed. Those students who participated were given snacks (e.g., fruit snacks, cookies, etc.) as a small reward.

Measures

Academic and Social Stress. Three subscales from the Adolescent Stress Questionnaire (ASQ; Byrne et al., 2007) were used to measure academic stress which is named “stress of school performance” in the questionnaire (seven items), peer stress named stress of peer pressure (seven items), and family stress named stress of home life (12 items). These three subscales will be analyzed separately and combined. Participants rated their stress experiences in the past year on a 5-point Likert scale ranging from *not at all stressful or irrelevant to me* to *very stressful*. An example of the items from each subscale is “having to study things you do not understand (academic stress)”, “parents expecting too much from you (family stress)”, and “pressure to fit in with peers (peer stress).” The ASQ subscales displayed test-retest reliability over the course of one week ($r = 0.68$ to 0.88) and construct validity was also supported. Convergent validity was

shown by moderate to strong, positive correlations between the ASQ and measures of anxiety and depression. Discriminant validity was evident by a negative correlation between the ASQ and a measure of self-esteem. Subscales used in the current study were found to have good internal reliabilities in previous studies ranging from .83 to .92 (Byrne et al., 2007) and .78 to .88 (McKay et al., 2016). The internal consistencies of these subscales based on the current sample are .89 (academic stress), .87 (family stress), and .88 (peer stress).

Externalizing Behaviors. The Strengths and Difficulties Questionnaire (SDQ) was used to measure externalizing behaviors (Goodman et al., 1998). There is a total of 5 subscales including Emotional Symptoms, Conduct Problems, Hyperactivity, Peer Problems, and Prosocial Behavior, with 25 items in total. Some past studies have found that the 5-factor scale was adequate, however, the current study's internal consistencies were insufficient. The hyperactivity subscale's coefficient alpha was .72, while the conduct problems subscale coefficient alpha was .54 for the current study. Research using both exploratory and confirmatory factor analyses has indicated that a three-factor structure of the scale is more stable in youth (Goodman, Lamping, & Ploubidis, 2010; Muris et al., 2004; Ruchkin, Jones, Vermeiren, & Schwab-Stone, 2008). Using the three-factor structure, the Hyperactivity and Conduct Problems subscales were combined to measure externalizing problems and the other two factors were internalizing problems (combining emotional problems and peer problems) and prosocial behavior. The SDQ consists on a 3-point scale including *Not True*, *Somewhat True*, and *Very True* and participants are asked to answer based on the past 6 months. An example of an externalizing behavior item from the SDQ is "I am restless. I cannot stay still for long." Past research showed that internal consistency was good with alpha coefficients of .82 for the total difficulties scale, .72 for conduct problems, .69 for hyperactivity, and .68 to .76 for externalizing problems (Muris et al., 2003; Ruchkin et

al., 2008). Test-retest reliability was found to be acceptable over the course of two months for Dutch youth aged 12 to 15 (Muris et al., 2003). Concurrent validity was supported by a high correlation with the Youth Self Report ($r = .74$) for the SDQ total scores (Muris et al., 2003). The current study will use the combined subscale of externalizing problems (conduct problems and hyperactivity combined, based on the 3-factor structure) to assess the levels of externalizing problems among adolescents. The internal consistency of the combined externalizing problems subscale used in the current study is .73.

Growth Mindset. Implicit Thoughts, Emotion, and Behavior Questionnaire (ITEB-Q) is a self-report measure developed for youth populations and developed using other implicit theory measures (Schleider & Weisz, 2016c). This measure is 12 items and uses a 6-point Likert scale ranging from *Very False* to *Very True* for how participants feel about the changeability of thoughts, feelings, and behavior among youth their age. The scale also ranges from entity theory to incremental theory with higher total scores meaning higher growth mindset beliefs. An example of an item is “You can always choose how you behave.” Implicit theories have been differentiated from similar constructs including perceived control and self-efficacy (Chen & Tutwiler, 2017; Schleider & Weisz, 2016b). Test-retest reliability was shown to be acceptable for three months (.46 to .57) and six months (.57 to .60). This instrument was developed after other implicit theory instruments that have been shown to have moderate to high internal consistency, test-retest reliability, and construct validity (Da Fonseca et al., 2008; Da Fonseca et al., 2009; Dweck, 1999; Schleider et al., 2014). The internal consistency of the scale for the current study is .91.

Planned Analyses

Analyses were completed using the IBM Statistical Package for Social Sciences 26.0 (IBM SPSS, IBM CORP, 2019). The data was checked by research assistants to ensure there were no problematic patterns or responses on the surveys. Problems were discussed with other lab members and supervisors to decide whether to retain the data. The current data were, initially, analyzed for missing data, normality, and outliers (Tabachnik & Fidell, 2013). Estimation maximization was used for missing data (Clogg & Goodman, 1984). Descriptive statistics were analyzed including means, standard deviations, range, skewness, and kurtosis to check the normality of the data. Correlations were computed to examine strength and directions of associations between main variables as well as to identify any issues of multicollinearity or singularity.

The PROCESS macro for SPSS was used to run four simple moderation analyses (Hayes, 2013). This analysis is a linear regression model and based on the ordinary least squares regression with confidence intervals to approximate the population. Each type of stress including family stress, peer stress, academic stress, and a combined, overall stress are the predictors and externalizing behaviors is the outcome. Growth mindset is the moderator. See Figure 1 in the Appendix for the conceptual model and Figure 2 in the Appendix for the statistical model. Gender, race, and age will be included as covariates due to past research findings. Moderation analyses were run for each of the three adolescent stressors and overall stress as the predictor in each model. The interaction between stress and growth mindset was analyzed and an effect was considered significant if there was not a zero included in the 95% confidence interval (Preacher & Hayes, 2008). If the interaction effect was significant, conditional analyses were run to detect across low (16th percentile), moderate (50th percentile), and high (84th percentile) levels of

growth mindset, how the direction and the strength of the association between stress and externalizing behaviors change.

The main effects and the interaction effects on externalizing problems (the dependent variable) were also tested via a hierarchical multiple regression analyses, controlling for age, gender, and race/ethnicity. In this model, the covariates were entered in Step 1, and then in Step 2, all the stress types were entered simultaneously. Next, growth mindset was entered in Step 3. Finally, all three interaction terms (each type of stress X growth mindset) were entered in Step 4. Results from this analysis would allow the examination of the effects of each independent variable and each interaction on the dependent variable simultaneously as well as the comparison of these effects in the same model.

Results

Preliminary analyses

Descriptive Statistics

The average levels of the individual stress types reported by the participants in the current sample were family stress ($M = 2.77$), academic stress ($M = 3.16$), and peer stress ($M = 2.30$). The average level of academic stress was the highest, between *Moderately Stressful* and *Quite Stressful*. Averages reported for family stress and peer stress were between *A Little Stressful* and *Moderately Stressful*. The average level of overall stress combined three types of stress ($M = 2.75$) was between *A Little Stressful* and *Moderately Stressful* indicating low to medium levels of normative stress. The average levels of externalizing behaviors reported by participants in the sample ($M = 0.57$) fell between *Not True* and *Somewhat True*. Regarding externalizing behaviors, a break-down frequency based on averages with 0.5 interval, a vast of majority of students reported scores between 0.00 and 0.49 ($N = 158$) and between 0.50 and 0.99 ($N = 191$),

and the rest reported scores between 1.00 to 1.49 ($N = 44$) and between 1.50 and 2.00 ($N = 6$). These scores indicated that, overall, adolescents reported low levels of overall externalizing behavior problems. Average levels of implicit theories of thoughts, emotions, and behaviors ($M = 4.37$) fell between *Somewhat True* and *True* on this 6-point scale. This indicates that this sample of adolescents reported relatively high levels of growth mindset. See Table 1 in the Appendix for descriptive statistics. The skewness and kurtosis in the current study indicates a normal distribution of the data.

Correlation Analyses

All the main variables were significantly correlated with one another in the current study (See Table 2). Using Cohen's (1988) interpretation of correlation coefficient's magnitude, growth mindset was negatively and weakly correlated with externalizing behaviors and all types of stress. The externalizing behavior variable was weakly correlated with peer stress, but was moderately correlated with overall stress, academic stress, and family stress. Each stress type (i.e., peer, academic, and family) was moderately correlated with one another, with correlations ranging between 0.55 to 0.62. Each stress type was strongly correlated with overall stress. See Table 2 in the Appendix.

Group Differences

An independent samples t-test was conducted to compare the externalizing behavior scores for boys ($M = 0.58$, $SD = 0.33$) and girls ($M = 0.56$, $SD = 0.34$; $t(388) = 0.42$, $p > .05$, two-tailed). There was no significant difference in reported externalizing behaviors for boys and girls. The magnitude of the differences in the means (mean difference = 0.014, 95% *CI*: -0.05 to 0.08) was very small ($\eta^2 = .0005$).

A one-way ANOVA between-groups analysis of variance was conducted to explore the differences of race on externalizing behaviors in adolescents. Participants were placed into three groups according to their self-reported race/ethnicity (Group 1: White/ European American; Group 2: Black/ African American; Group 3: Other minorities, including Asian/ Asian American, Hispanic/ Latinx, Native American, Biracial/ Multiracial, and other). There was an overall statistically significant difference in the level in externalizing behavior scores in the groups $F(2, 388) = 4.07, p < .05$. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for White adolescents ($M = 0.61, SD = 0.03$) was statistically higher than Black adolescents ($M = 0.51, SD = 0.33$). Despite reaching statistical significance, the effect size in mean scores between groups was very small ($\eta^2 = .021$). Group 3 ($M = 0.60, SD = 0.32$) did not differ significantly from Groups 1 or 2.

Moderation Analyses

The potential moderation effect of growth mindset in the relation between normative stress (predictor) and adolescent externalizing behavior problems (outcome) was conducted through hierarchical multiple regression analyses in the PROCESS macro for SPSS. There were four models conducted for each type of stress (family, peer, and academic) and overall stress that combined three types of stress measured in the current study. Based on prior research which indicated that age, gender, and race might lead to group differences for externalizing behaviors, these variables were included as covariates in each of the four models.

In the first model with family stress as the predictor, both gender and race accounted for a significant amount of variance ($p < .05$). The overall model was found to be significant, $R^2 = .17, F(6, 381) = 13.38, p < .001$, and family stress accounted for a significant amount of variance in adolescent externalizing behaviors, $\beta = 0.38, 95\% \text{ CI } [.17, .59], t = 3.53, p < .001$. When the

interaction term for family stress and growth mindset was added to the regression model, it accounted for a significant proportion of the variance in externalizing behaviors, $\Delta R^2 = .02$, $\Delta F(1, 381) = 6.87, p < .01, \beta = -0.06, 95\% \text{ CI } [-.11, -.02], t = -2.62, p < .05$. The conditional effect analysis revealed that across low (16th percentile), moderate (50th percentile), and high (84th percentile) levels of growth mindset, the associations between family stress and externalizing behaviors were positive and significant; and as the levels of growth mindset increased, the association between family stress and externalizing behaviors weakened. These results suggested that the moderation effect of growth mindset is significant. The regression results and the conditional effect results of Model 1 are shown in Table 3 and 4 in the Appendix, respectively.

The second model, with adolescent peer stress as the predictor, resulted in the covariate, race, accounting for a significant amount of variance ($p < .05$). The analysis showed that the overall model accounted for a significant amount of the variance in externalizing behaviors, $R^2 = .11, F(6, 381) = 7.88, p < .001$. However, the interaction term between peer stress and growth mindset did not account for a significant proportion of the variance for externalizing behaviors, $\Delta R^2 = .00, F(6, 381) = 0.0002, \beta = 0.0003, 95\% \text{ CI } [-0.04, 0.04], t = 0.01, p > .05$. Similarly, results of the third model with adolescent academic stress as the predictor showed the overall model accounted for a significant amount of the variance for adolescent externalizing behaviors, $R^2 = .16, F(6, 381) = 12.21, p < .001$. Race, as a covariate, accounted for a significant amount of variance in this model ($p < .01$), as well as gender ($p < .05$). The academic stress and growth mindset interaction did not account for a significant proportion of the variance for externalizing behaviors, $\Delta R^2 = .000, F(6, 381) = 0.0002, p = .99, \beta = -.0002, 95\% \text{ CI } [-0.04, 0.04], t = -0.01, p > .05$. See Table 5 and 6 in the Appendix for these model results, respectively.

The final model took adolescent overall stress as the predictor and revealed that the covariate, gender, accounted for a significant amount of stress ($p < .01$), as well as race ($p < .05$). In this model, the overall model accounted for a significant proportion of the variance for externalizing behaviors, $R^2 = .17$, $F(6, 381) = 13.09$, $p < .001$. The variable, overall stress, accounted for a significant amount of variance of externalizing behaviors, $\beta = .29$, 95% CI [0.06, 0.52], $t = 2.53$, $p < .05$. The interaction term between adolescent stress and growth mindset did not account for a significant proportion of the variance in adolescent externalizing behavior problems, $\Delta R^2 = .01$, $F(6, 381) = 2.19$, $p > .05$, $\beta = -0.04$, 95% CI [-0.09, 0.01], $t = -1.48$, $p = .14$. The results of this model are displayed in Table 7 in the Appendix.

Supplemental Analyses

The direct effects and moderation effects were also tested via a hierarchical multiple regression analyses to enable the comparisons of the effects between different independent variables or different interactions while all the effects are accounted for. Results showed that covariates did not significantly predict externalizing behavior problems in the initial step. Results indicated in the second step of the model that as age increased, externalizing behavior problems decreased ($\beta = -0.03$, $t = -1.99$, $p < .05$). Regarding gender, boys displayed more externalizing behaviors than girls ($\beta = -0.10$, $t = -2.95$, $p < .01$). Additionally, race did not significantly predict externalizing behaviors. Before the interaction terms were added to the model, family stress and academic stress were both significant, so was growth mindset ($\beta = -0.08$, $t = -3.76$, $p < .01$). These results indicate that as family stress and academic stress increase, externalizing behaviors increase ($\beta = 0.09$, $t = 3.63$, $p < .01$; $\beta = 0.07$, $t = 3.22$, $p < .01$, respectively); and as growth mindset increased, externalizing behaviors decreased. After adding the interaction terms, family stress remained significant while academic stress and peer stress were not significant. The

interaction between family stress and growth mindset was the only significant predictor of the outcome variable ($\beta = -0.10, t = -3.04, p < .01$). Thus, the major finding regarding the interaction effect is consistent with the finding on the moderation effect of growth mindset in the model with family stress as the predictor from the PROCESS analyses. These results are presented in Table 8 in the Appendix.

Discussion

The current study sought to explore the possible moderator role of growth mindset of thoughts, emotions, and behaviors in the context of normative stress in affecting adolescents' externalizing behaviors. Four separate moderation models were analyzed with four different types of stress as the predictor, including family stress, peer stress, academic stress, and overall stress which is the combination of the three types of stress. Age, gender, and race/ethnicity were included as covariates based on past research findings. The primary finding is that growth mindset moderated the relation between family stress and externalizing behaviors. Specifically, as the level of growth mindset in adolescents increased, the magnitude of the relation between family stress and externalizing behaviors weakened. The moderation effect was not significant in other models. Major findings are discussed in more detail below.

Descriptive statistics revealed that adolescents reported academic stress (between the “Moderately Stressful” and “Quite Stressful” range) as the highest level of stress, followed by family stress, and then peer stress. In general, this sample of adolescents do not represent population that experience elevated levels of normative stress. Externalizing behaviors included both conduct problems and hyperactivity in the current study. Adolescents reported whether the behaviors were not true, somewhat true, or certainly true of reflecting themselves in the past six months via the Strengths and Difficulties Questionnaire. Most adolescents (87.5%) reported

relatively low levels of externalizing behaviors, with 12.5% or 50 students reporting moderate to high levels of externalizing behaviors. These results indicate that a large portion of this sample of adolescents did not perceive themselves having conduct problems or hyperactivity often. Given the diverse characteristics of the sample with the largest portion of parents having either a bachelor's or master's degree and the data collected at a large, well-resourced public school, such levels of self-reported externalizing behaviors were expected.

Gender differences were not found in the means of self-reported externalizing behaviors; however, gender was significantly associated with externalizing behaviors in the models with family stress, academic stress, and overall normative stress as the predictors. Specifically, being male was associated higher levels of externalizing behaviors. This finding is consistent with past research that has found boys display more externalizing behaviors compared to girls (Chaplin & Aldao, 2013; Karreman et al., 2009; Leadbeater, et al., 1999) and late adolescent males displayed more externalizing behaviors than females (Hicks, 2007; Liu, 2004).

The current study also found that White adolescents reported significantly more externalizing behaviors than Black adolescents. Race also significantly predicted externalizing behaviors in all moderation models. These findings are inconsistent with the general conclusion from previous studies, which suggest that there were either no differences in behaviors between Black adolescents and White adolescents, or that Black adolescents had more externalizing behavior problems (Cuffe et al., 2005; Daughters et al., 2009; Lansford et al., 2006; McLaughlin et al., 2007; Rowland et al., 2001). One factor that might play into the inconsistent pattern is that externalizing behaviors measured in the current study included both conduct problems and hyperactivity. The racial differences in externalizing behaviors, however, seem to have mixed findings. Specifically, for conduct problems, past research found that Black adolescents

demonstrated more delinquency (Daughters et al., 2009) and more aggression (Lansford et al., 2006; McLaughlin et al., 2007). For ADHD symptoms or diagnoses, however, previous studies found no difference between Black and White adolescents (Cuffe et al., 2005; Rowland et al., 2001). It is possible that in the sample of the current study, Black and White adolescents reported mean level differences in conduct problems and hyperactivity but with different pattern. By combining these two types of behaviors, however, shifted the overall compassion results. Another factor to consider is the contextual characteristics of the samples in the current study and previous studies that indicated higher levels of externalizing behaviors in Black adolescents. Past studies have consistently showed that lower parental education level, lower SES, and childhood adverse experiences are all risk factors of externalizing behaviors across childhood and adolescence (Lansford et al., 2006). The school where the sample was recruited in general is a diverse and well-resourced school, with a majority of students coming from middle to higher levels of SES families with well-educated parents. It is possible that these factors could have mitigated racial differences that were found in past studies.

The average level of growth mindset among all participants ($M= 4.37$) indicating relatively higher levels of growth mindset. Gender differences revealed that male participants had significantly stronger levels of growth mindset ($M= 4.48$) than females ($M= 4.30$). This is consistent with past research found that boys held stronger growth mindset of thoughts, emotions, and behaviors (Schleider & Weisz, 2016a). Regarding race/ethnicity, Black students reported significantly stronger growth mindsets of thoughts, emotions, and behaviors than White students. Additionally, White students reported significantly lower levels of growth mindset than all other races and ethnicities grouped together including Hispanic, Asian American, etc. To my best knowledge, this is the first study that analyzed racial differences in growth mindset, and the

results suggested that there may be differences in growth mindset of thoughts, emotions, and behaviors across different racial populations. It is possible that this type of growth mindset is particularly fostered in the cultural context in which Black adolescents grow up, and/or it manifests in a way that is more accessible to Black adolescents so they report more frequent use of growth mindset. Additional research is needed to further examine these differences as well as how this might lead to different outcomes in different races and why this difference might exist.

Correlations between all variables were in the expected directions. Correlations of stress types with one another were moderate and positive while each type of stress was strongly correlated with overall stress. Externalizing behaviors was correlated with overall stress, academic stress, and family stress moderately, which in general is consistent with past findings (Cumming et al., 2019). Externalizing behaviors was weakly correlated with peer stress in this study, and aligns with previous studies (Bakker et al., 2010). Growth mindset of thoughts, emotions, and behaviors had negative and weak correlations with externalizing behaviors. Past studies found that fixed mindsets of thoughts, emotions, and behaviors were moderately to strongly positively correlated with internalizing and externalizing behaviors in middle school students (Schleider & Weisz, 2016b). Although, Schleider and Weisz (2016b) used a fixed mindset variable regarding implicit theories, the current study takes a continuum approach that conceptualize mindset on a spectrum with growth mindset on one end and fixed mindset on the other end. Therefore, the correlation between growth mindset and externalizing behaviors from the current study and Schleider and Weisz's (2016b) indicated the same conclusion.

When taking three types of stress together as overall normative stress, it predicted externalizing behaviors, which is similar to past research findings that reported overall stress is predictive of externalizing behaviors (Kim et al., 2003; Leadbetter et al., 1999; Weeland et al.,

2019). However, the interaction of overall stress and growth mindset did not have significant effects on externalizing behaviors. When taking each type of stress as individual predictors, the interactions between stress and growth mindset became clearer.

The most important finding is growth mindset as a moderator for family stress and externalizing behaviors. In the model with family stress as the predictor, family stress, or stress of home life, was significantly associated with externalizing behaviors. These findings align with past research that family stress is a risk factor for a range of externalizing behaviors (Deković et al., 2003; Francisco et al., 2015; Henderson et al., 2006; Low et al., 2012; Voisin et al., 2016). Additionally, it was reported that family stress has been seen as more stressful than peer stress from adolescents' perspective (Persike & Seiffge-Krenke, 2016). When growth mindset of thoughts, emotions, and behaviors was added to the model as the moderator, family stress and growth mindset interacted to predict externalizing behaviors. More specifically, when adolescents displayed higher levels of growth mindset, the positive association between family stress and externalizing behavior problems was weakened. This is the first study, to my best knowledge, that demonstrated growth mindset is a protective factor to reduce externalizing behavior problems in the context of family stress. This is similar to past studies that also found beneficial, protective effects of growth mindset in the context of stress but with internalizing problems as the outcome such as depression, distress, or maladaptive coping strategies (Jiang et al., 2019; Park et al., 2018; Schroder et al., 2017). Past growth mindset studies used other types of growth mindset related to mental health with other age groups. This is the first study to use mindset of thoughts, emotions, and behaviors and examine its relation as a moderator to externalizing behaviors in older adolescents.

Only a few studies that used growth mindset as the foci construct and applied to moderation models. In general, they supported the beneficial impacts of growth mindset in the context of stress. For instance, growth mindset of stress and growth mindset of anxiety have been studied as moderators which weaken the relations between stressful or significant life events and negative consequences such as anxiety, alcohol abuse, and non-suicidal self-injury (Jiang et al., 2019; Park et al., 2018; Schroder et al., 2017). In another study with a sample of undergraduates, Schroder and colleagues (2017) found that growth mindset of anxiety weakened the relation between stressful life events (e.g., physical assault, natural disaster) and perceived distress and maladaptive coping strategies (i.e., alcohol abuse, and non-suicidal self-injury). This study measured more serious stressors opposed to normative stress, and more serious outcome problems in an older sample of adults in contrast with adolescents, but nevertheless, it incorporated the use of growth mindset in the mental health context and found promising results for a type of growth mindset weakening the adverse outcomes that stress often induces. Moreover, in a longitudinal study with a sample of 8th graders, researchers tested the moderating effect of growth mindset of stress, which referred to the thinking of if stress is beneficial, in comparison to a fixed mindset of stress, or thinking that stress is detrimental, and found that a growth mindset of stress weakened the relation between adverse life events (e.g., close friend had problems, parents separated or divorced) and perceived distress (Park et al., 2018). This sample of Park et al's study was younger and diverse, and it assessed both normative and non-normative stressors. Its findings on the beneficial effects of growth mindset though in a different mindset domain, showed the promising role of growth mindset in protecting adolescents' mental health.

Both observational studies and intervention studies provided useful results that suggest how growth mindset facilitates positive functioning. For example, some cross-sectional studies revealed the relations between mindsets and mental health problems, though most of them focused the interpretation of the findings on fixed mindsets (Schleider et al., 2015; Schleider & Weisz, 2016a). Specifically, Yaeger and Dweck (2012) posited that youth with fixed mindsets have more negative interpretations of stressful situations. Therefore, these negative interpretations would likely lead to greater mental health problems than those who have more positive interpretations of stress. Fixed mindsets have also been found to be associated with maladaptive thinking after difficulties which would lead to negative consequences for adolescents' mental health (Schleider et al., 2019; Yaeger & Dweck, 2012). These findings offered an important mechanism that may explain how weaker growth mindset, or stronger fixed mindset, has weaker protective effect. Adolescents with a fixed mindset of thoughts, emotions, and behaviors tend to believe that they are unable to control those behaviors that result from stress. Then it is less likely for them to think in a positive way, find constructive solutions, or resolve the problems related to family stress; instead, they more likely interpret family stress like arguments with parents negatively, feel less control, and not regulate their thoughts and emotions, which might lead to more maladaptive coping, such as displaying externalizing behaviors.

Interventions of increasing growth mindset have been found to be effective in benefiting several areas. Benefits have included reduced depressive symptoms (Miu & Yaeger, 2015; Schleider & Weisz, 2018; Schleider et al., 2019), increased perceived control (Schleider & Weisz, 2016c; Schleider & Weisz, 2018), and decreased anxiety (Schleider & Weisz, 2018). All of these interventions were also utilized in a single session for adolescents. Such intervention

teaches that characteristics related to one's own mental health can be changed and therefore, leads to a more adaptable approach to coping. In comparison to believing characteristics are deficits within oneself that are not within their control and could lead to helplessness in stressful situations leading to more mental health problems. Cognitive-behavioral therapy teaches individuals how to better cope with stressful situations, but growth mindset could work to prevent problems that further the need for this more intensive intervention (Schleider & Weisz, 2016; Weisz et al., 2013). If adolescents believe that they can control their thoughts, emotions, and behaviors, especially in response to what could be perceived as a negative situation, then they would be less likely to have negative coping approaches and have less negative effects on mental health. If adolescents believe they can control how they think, behave, and control their emotions amidst or after a stressful family situation then they may interpret the situation more positively and cope in a healthier way that includes controlling their outward behaviors. Given that growth mindset interventions have decreased adolescents' mental health problems, it is likely that growth mindset could also protect against mental health concerns in the face of stressors that adolescents often experience. The current study provides some support for this postulation by finding externalizing behavior problems decreased in the face of family stress for those who have a stronger growth mindset. Contrary to the hypotheses, neither peer stress nor academic stress significantly predicted externalizing behaviors in two other moderation models. In addition, growth mindset did not significantly interact with academic stress or peer stress to predict externalizing behaviors. There were limited studies on the direct effects of academic stress and externalizing behavior. One study did find that academic stress increased externalizing behaviors in 6th, 7th, and 8th graders (Bjorkman, 2007). A few other studies reported that various types of peer stress predicted externalizing behaviors in young adolescents specifically (Bakker

et al., 2010; Cumming et al., 2019). Aside from age difference, Cumming et al.'s study (2019) included a portion of students who were already at-risk and receiving services for behavior problems, it is possible that for late adolescents in high schools, how the normative peer or academic stress affects behavior problems works differently compared to younger adolescents in middle schools. For instance, late adolescents become better at monitoring and regulating their emotions compared to early adolescents (Skinner & Zimmer-Gembeck, 2007), which could enable late adolescents more effectively deal with mild to moderate peer stress and not cope with it by acting out or other externalizing behaviors. However, it should be noted that the effects of more serious peer stress in comparison to normative stress, like relationship losses and physical or verbal peer degradation, have more detrimental effects on adolescents' mental health (Bakker et al., 2010). Further investigation on how growth mindset works in the context of more significant peer stress is needed.

Based on the supplemental hierarchical multiple regression analyses with all types of stressors as the predictors and all interaction terms in the model, some interesting findings were revealed regarding the differential effects of these types of stressors on predicting the outcome. Specifically, both family stress and academic stress were found to predict externalizing behaviors. The interaction term of family stress and growth mindset also significantly predicted externalizing behaviors which aligned with the finding from the single predictor moderation analyses above. It is interesting that growth mindset functions as a protective factor for family stress but not for peer stress and academic stress. On one hand, it is possible that due to the weak associations between peer stress and academic stress and externalizing behaviors, it would be harder for a variable to demonstrate moderator effect in order to further weaken the association. Also, a potentially healthier school environment which might have positive effects on academic

and peer relations, which might explain the weaker association between peer/academic stress and externalizing behaviors. It is also possible that how growth mindset works in the context of academic or peer stress is more complicated and not captured in the proposed models in the current study. Other variables and effects need to be further examined to reveal how growth mindset interacts with academic or peer stress. On the other hand, family stress, especially when it is chronic and accumulative, even within the limits of stress that is considered as normative, may affect adolescents similarly as significant stress. In general, family stress also has strong effects on adolescent mental health (Francisco et al., 2015; Henderson et al., 2006; Persike & Seiffge-Krenke, 2016). The protective role of growth mindset (anxiety) was found in the context of significant life stressors in undergraduates (Schroder et al., 2017). Growth mindset interacted with stress to predict PTSD symptoms, depression symptoms, drug abuse, and non-suicidal self-injury. Family stress might be more likely to, similarly, interact with growth mindset, but more research is needed to determine the process of this interaction. Future studies should test if growth mindset functions as a moderator when adolescents encounter other types of stress, such as significant life stress or non-normative stress (e.g., death of a parent or cultural stress).

Limitations and Future Directions

Strengths of the current study include the large, diverse sample that allowed for more statistical power and greater generalizability when interpreting results. The novelty in the current study includes testing growth mindset in the context of different types of stress (i.e., academic, peer, and family) with externalizing behaviors as the outcome in moderation models, which had not been examined in the literature.

A limitation of this sample is the participants were all from an urban high school in the midsouth region of the United States, which unlikely represents adolescents in other

geographical regions or from rural and suburban areas. Future studies should strive to include adolescents from rural and suburban areas or a range of geographic locations. Also, those who identify as gender diverse may experience unique amounts of stress, especially related to peers and family and, therefore may bring a unique perspective regarding the protective role of growth mindset. Thus, future studies should investigate the research question in more gender diverse students including transgender students or students identifying as non-binary gender.

Another limitation was the cross-sectional nature of the data, which does not allow for causal inferences to be made. Future studies should incorporate a longitudinal and/or experimental design to draw further conclusions about associations between the variables over time. The current study also relied solely on self-report methods of stress, growth mindset, and externalizing behavior problems. Some limitations of self-report include participants reporting socially desirable answers than accurate responses and participants being able to assess themselves accurately. In addition, Goodman et al. (1998) found that the Strengths and Difficulties Questionnaire (SDQ) self-report is less likely to detect externalizing problems than the parent and teacher report methods. More research regarding the psychometric properties of this scale is needed, particularly for the adolescent self-report form and in sample of American youth (Ruchkin et al., 2008). Future studies should also consider different instruments to measure externalizing behaviors in a more comprehensive form. In future studies, researchers also should consider including parent reports or more objective reports of behavior (office discipline referrals) as well as self-reports to have the measurement of externalizing problems that is more accurate and sensitive to change or group differences.

To test the generalizability of the role of growth mindset in other areas of adolescent development, future studies may incorporate other outcome variables such as internalizing

problems or well-being (e.g., life satisfaction), independent variables such as non-normative stress, and potential moderating variables such as growth mindset in other domains, grit, or emotion regulation. Researchers should continue to explore the benefits of growth mindset and psychological strengths in general in the face of normative stress and the adverse consequences of stress in children and adolescents. Also, more longitudinal and intervention research on growth mindset of thoughts, emotion, and behaviors are needed. Due to the lack of knowledge regarding the mechanisms of the moderating effects of growth mindset in the context of family stress and externalizing behaviors, more studies are needed to explore these mechanisms.

Implications

Given the paucity of research in the area of growth mindset and mental health in adolescents, findings from this study furthers knowledge of growth mindset of thoughts, emotions, and behaviors and its relation to mental health. Results of this study supported that growth mindset of thoughts, emotions, and behaviors is a protective factor that weakened the relation between family stress and externalizing behaviors in adolescents. These results provide parents, educators, and mental health professionals evidence of the benefits of teaching and nurturing growth mindset in adolescents, especially those struggling with family stress and externalizing problems. An intervention program that is brief, publicly available, and based on prior growth mindset interventions is called Growing Minds and can be used by mental health professionals or parents (Schleider et al., 2019). Such a brief prevention and intervention method focusing on growth mindset and the ability for change might also assist mental health professionals in getting “buy in” and increasing motivation and engagement in longer term interventions such as cognitive-behavioral therapy. Many of the growth mindset interventions first presented participants with a scientific basis of neuroscience articles on brain plasticity and

that the pathways in the brain that are impacted by thoughts and emotions have the ability to change (Miu & Yeager, 2015; Schleider & Weisz, 2016c; Schleider et al., 2019). They also included quotes and examples from older students, who were seemingly role models, who recognized and agreed with the science of the ability for traits to change. Then participants used their own examples based on information they just learned to make their own quotes for students and the goal was for the participants to internalize the growth mindset beliefs. These may be beneficial ways to engage youth in growth mindset and begin the teaching and nurturing of growth mindset. Implicit theory research has also suggested that parents foster a growth mindset through the type of praise that they give children (Gunderson et al., 2018). Praising children's characteristics might foster the belief that their positive outcomes are due to innate traits. In comparison to praising their effort and the process leading to the outcome which might make children believe they have control over the outcomes because they have control over their effort. Related to the current study, it might be beneficial for parents and other adults to praise adolescents who control and regulate their thoughts, feelings, and behaviors especially when experiencing stress in the family environment. Current mindset interventions are in the domains of personality and intelligence but have not extended to the area of mental-health related concepts, such as mindsets of thoughts, emotions, and behaviors. Future intervention studies are needed to test the application of growth mindset in mental health, which may have significant value for schools, families, and communities to nurture growth mindset and subsequently increase adolescents' abilities to cope with stress and protect their mental health. Implicit theory research has consistently observed how praise affects mindsets and outcomes. For example, children praised for their effort of positive outcomes were more likely to seek out challenging tasks they could learn more from, had better achievement outcomes (Mueller & Dweck, 1998),

and believe their abilities were malleable and could be positively changed (Gunderson et al., 2013; Zentall & Morris, 2010). In a similar vein, it is likely praising adolescents' effort and control of managing emotions and behaviors, thinking positively, and coping with stress in healthy ways is one way to support growth mindset of thoughts, emotions, and behaviors. Mental health professionals and parents can work to promote and strengthen growth mindset in adolescents in relatively simple ways.

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Appendix

Table 1. Descriptive Statistics of Stress, Externalizing Behaviors, and Growth Mindset

<i>Measure</i>	<i>Mean</i>	<i>SD</i>	<i>Range</i>	<i>Skewness</i>	<i>Kurtosis</i>
<i>Overall Stress</i>	2.75	0.82	1 – 5	-0.04	-0.53
<i>Family Stress</i>	2.77	0.93	1 - 5	-0.03	-0.75
<i>Peer Stress</i>	2.30	0.98	1 - 5	0.62	-0.33
<i>Academic Stress</i>	3.16	1.02	1 - 5	-0.15	-0.82
<i>Externalizing Behaviors</i>	0.57	0.34	0 – 2	0.59	-0.02
<i>Growth Mindset</i>	4.37	0.81	2 - 6	-0.28	0.11

Table 2. Correlations between Main Variables

<i>Variable</i>	1.	2.	3.	4.	5.	6.
<i>1. Overall Stress</i>	--	--	--	--	--	--
<i>2. Family Stress</i>	.92**	--	--	--	-	--
<i>3. Peer Stress</i>	.73**	.61**	--	--	--	--
<i>4. Academic Stress</i>	.84**	.58**	.53**	--	--	--
<i>5. Externalizing Behaviors</i>	.34**	.30**	.21**	.31**	--	--
<i>6. Growth Mindset</i>	-.28**	-.22**	-.24**	-.27**	-.27**	--

Note: ** Correlation is significant at the 0.01 level.

Table 3. Moderating Effects of Growth Mindset on the Relation between Family Stress and Externalizing Behaviors

	R²	F	β	SE	t	ΔR²
<i>Constant</i>			0.26	.39	0.67	
<i>Gender</i>			-0.08	.03	-2.59*	
<i>Race</i>			0.03	.01	2.34*	
<i>Age</i>			-0.02	.01	-1.59	
<i>Family Stress</i>			0.38	.11	3.53**	
<i>Growth Mindset</i>			0.09	.07	1.25	
Model Summary	.17	13.38**				
<i>Family Stress × Growth Mindset</i>		6.87	-0.06	.02	-2.62**	.02

Table 4. Conditional Effects of Family Stress on Externalizing Behaviors at Levels of Growth Mindset

Levels of Growth Mindset	β	SE	<i>t</i>	<i>p</i>
Low: 3.67	0.15	.03	5.76	<.001
Moderate: 4.41	0.11	.02	5.99	<.001
High: 5.08	0.07	.02	2.94	.003

Note: Significant interactions were probed using the 16th, 50th, and 84th percentiles to estimate the conditional effects of the predictor at low, moderate, and high levels of the moderator.

Table 5. Moderating Effects of Growth Mindset on the Relation between Peer Stress and Externalizing Behaviors

	R²	F	β	SE	t	ΔR²
<i>Constant</i>			1.14	.35	3.29**	
<i>Race</i>			0.03	.01	2.45*	
<i>Age</i>			-0.02	.01	-2.21*	
<i>Gender</i>			-0.06	.03	-1.74	
<i>Peer Stress</i>			0.06	.09	0.62	
<i>Growth Mindset</i>			-0.10	.05	-1.84	
<i>Model Summary</i>	.12	8.24**				
<i>Peer Stress × Growth Mindset</i>		0.0002	0.0003	.02	0.01	.000

Table 6. Moderating Effects of Growth Mindset on the Relation between Academic Stress and Externalizing Behaviors

	R²	F	β	SE	t	ΔR²
<i>Constant</i>			1.05	0.39	2.71**	
<i>Race</i>			0.03	0.01	2.92**	
<i>Age</i>			-0.02	0.01	-1.76	
<i>Gender</i>			-0.08	0.03	-2.37*	
<i>Academic Stress</i>			0.09	0.09	1.06	
<i>Growth Mindset</i>			-0.08	0.07	-1.28	
Model Summary	.15	11.57**				
<i>Academic Stress × Growth Mindset</i>		.0002	-0.0002	.02	-0.01	.000

Table 7. Moderating Effects of Growth Mindset on the Relation between Overall Adolescent Stress and Externalizing Behaviors

	R²	F	β	SE	t	ΔR²
<i>Constant</i>			0.47	.42	1.12	
<i>Race</i>			0.03	.01	2.48*	
<i>Age</i>			-0.02	.01	-1.43	
<i>Gender</i>			-0.09	.03	-2.79**	
<i>Stress</i>			0.21	.12	2.53*	
<i>Growth Mindset</i>			0.03	.07	0.33	
Model Summary	.17	13.09**				
<i>Stress × Growth Mindset</i>		2.19	-0.04	.03	-1.48	.005

Table 8. Moderating Effects of Growth Mindset on the Relation between Adolescent Stress and Externalizing Behaviors

	Model 1			Model 2			Model 3			Model 4		
	β	SE β	t	β	SE β	t	β	SE β	t	β	SE β	t
<i>Gender</i>	-0.01	.03	-0.34	-0.08	.03	-2.50*	-0.09	.03	-2.74**	-0.10	.03	-2.95**
<i>Race/ Ethnicity</i>	-0.01	.02	-0.40	-0.01	.02	-0.52	-0.002	.02	-0.10	-0.004	.02	-0.20
<i>Age</i>	-0.02	.01	-1.54	-0.03	.01	-2.00*	-0.02	.01	-1.72	-0.03	.01	-1.85
<i>Family Stress</i>				0.09	.02	3.63**	0.08	.02	3.48**	0.51	.14	3.59**
<i>Academic Stress</i>				0.07	.02	3.22**	0.06	.02	2.74**	-0.06	.10	-0.61
<i>Peer Stress</i>				-0.01	.02	-0.33	-0.01	.02	-0.55	-0.09	.12	-0.79
<i>Growth Mindset</i>							-0.08	.02	-3.76**	0.06	.08	0.80
<i>Family Stress x Growth Mindset</i>										-0.10	.03	-3.00**
<i>Academic Stress x Growth Mindset</i>										0.03	.02	1.18
<i>Peer Stress x Growth Mindset</i>										0.02	.03	0.70
Model Summary: R²	.02			.15			.18			.20		

Note: *p < .05, **p < .01.

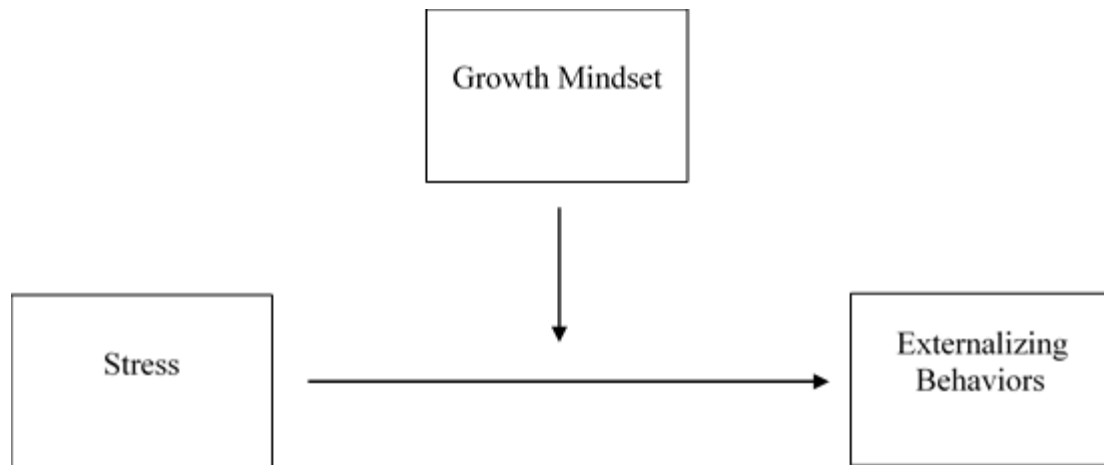


Figure 1. Conceptual model of the current study.

Note. Each type of normative stress, including academic, family, peer stress, and overall stress will be a single predictor in each moderation model.

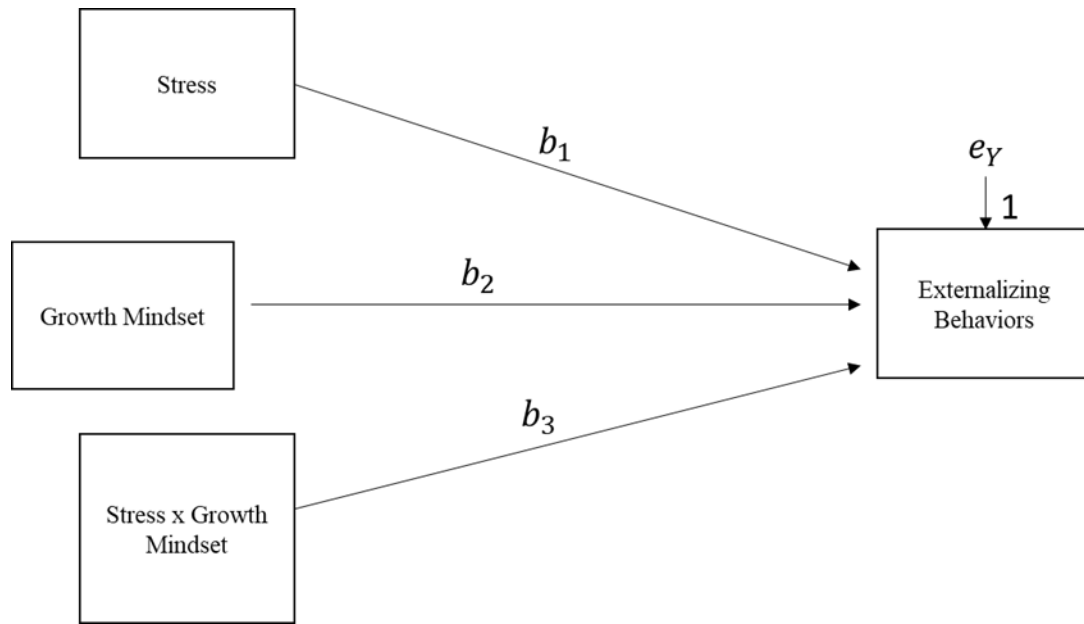


Figure 2. Statistical diagram of the conceptual simple moderation model. The interaction effect of stress and growth mindset on the externalizing behaviors outcome.

Note. This model is represented by the following formula: Conditional effect of X on Y = $b_1 + b_3M$.

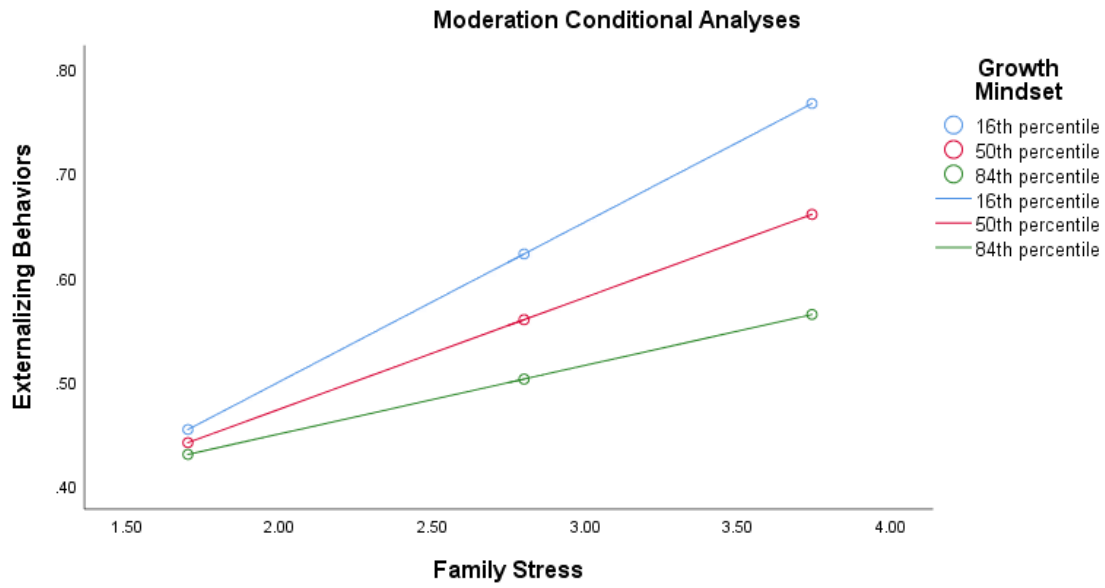


Figure 3. Conditional Effects of Growth Mindset in the Relation between Family Stress and Externalizing Behaviors.

Fw: PRO-FY2020-39 - Initial: Approval - Expedited

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January 3, 2020

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Submission Type: Initial
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The University of Memphis Institutional Review Board, FWA00006815, has reviewed your submission in accordance with all applicable statuses and regulations as well as ethical principles.

Approval of this project is given with the following obligations:

1. When the project is finished a completion submission is required
2. Any changes to the approved protocol requires board approval prior to implementation
3. When necessary submit an incident/adverse events for board review
4. Human subjects training is required every 2 years and is to be kept current at citiprogram.org.