ABSTRACT

Title of Dissertation:	PERCEIVED STRESS AND ACADEMIC ENGAGEMENT FOR DUAL LANGUAGE LEARNERS: GRIT AND ACADEMIC SUPPORT AS PROTECTIVE FACTORS
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For decades, the academic achievement gap between dual language learners (DLLs) and their non-DLL counterparts has remained at the forefront of education research. Stress is considered one of many contributors given its negative effects on academic achievement. However, little research exists on the effects of stress on academic engagement for DLLs, despite evidence that academic engagement is paramount for academic success. This study examines grit (teacher-reported and student-reported) and academic support (teacher and peer) as protective factors via moderation model testing of the relationship between perceived stress and two subtypes of academic engagement: emotional engagement (teacher-reported and student-reported) and behavioral engagement (student-reported only). Relying on transactional stress theory and risk and resilience theory, this model was tested using data collected from a school serving a majority of low-income, dual language learner

(DLL) 3rd, 4th, and 5th grade students (N = 142, 75% Latinx). Results indicated peer academic support was a protective factor for high-stressed DLL students (with outcome of student-reported emotional engagement) while student-reported grit was a protective factor for low-stressed DLL students (with outcome of teacher-reported emotional engagement). Schools and school psychologists are encouraged to address DLL students' stress and implement evidence-based, systems-level practices that can mitigate the effects of stress on academic engagement for this demographic.

PERCEIVED STRESS AND ACADEMIC ENGAGEMENT FOR DUAL LANGUAGE LEARNERS: GRIT AND ACADEMIC SUPPORT AS PROTECTIVE FACTORS

by

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Dissertation submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
2021

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Dedication

This dissertation is dedicated to my parents, Felix Anthony Estevez III and Melanie Inez Estevez. None of this would have been possible without your love and constant support. I am honored to be your daughter and eternally grateful for the many sacrifices you both made to allow me to be where I am today.

Acknowledgements

Thank you to my cohort mates (Alyssa Daye, Kristen Marsico, Jill Briody, Sabrina Callan, Ana Ross, and Helena Shoplik) for being an incredibly supportive community and for being my friends. Thank you to all of my wonderful friends and mentors who I have met through the Emotions, Equity, and Education Lab at the University of Maryland (Ranga Atapattu, Annie Goldthrite, Nicole Gosnell, Michal Boyers, Alyssa Daye, Leyla Babaturk, Kristin Meyering, Shannon Martin, and Hayley Weinberg). Without your constant support and willingness to read many, many drafts of my work I would not be in the position I am in today. I especially want to thank my advisor, Dr. Colleen O'Neal, for being there every step of the way, from tackling complicated statistical analyses to tempering my anxiety, while completing this dissertation. Thank you to my dissertation committee members, Dr. Kelly Lee, Dr. Richard Shin, Dr. Cixin Wang, and Dr. Ji Seung Yang, for their insightful comments and edits throughout my proposal and defense. Lastly, but never least, I want to thank my parents, Felix and Melanie Estevez, who watched me succeed and fail through every part of this program (and life!) and never stopped believing in me. *¡Sí se puede!*

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Chapter 1: Introduction

Dual language learners (DLL) are the most rapidly growing portion of the K-12 student population in the U.S. (Genesee, Lindholm-Leary, Saunders, & Christian, 2005). Between 2000 and 2017, the population of school-aged DLL students increased by 24 percent (Park, O'Toole, & Katsiaficas, 2017). At present, there are over 11 million DLLs aged 8 and under (Park et al., 2017). The Migration Policy Institute (2015) predicts that the population growth of DLLs will continue on this upward trend, with their numbers expected to double within the next decade. Currently, Spanish (64%) is the leading language spoken by both immigrant and foreign-born DLLs, followed by Chinese dialects (3%), Vietnamese (3%), Korean (2%), and Tagalog (2%) (Migration Policy Institute, 2015; Zong & Batalova, 2015).

Following the definition provided by the Migration Policy Institute, DLLs are considered to be children who have at least one parent who speaks a language other than English at home (Park et al., 2018). For the purposes of this study, the child must speak this language with at least one parent in the home. Though the majority of DLLs identify as Hispanic and Spanish-speaking, trends show that as the population of DLLs in the U.S. has risen, so has their cultural makeup. The growing "superdiversity" of DLLs has been acknowledged by the increasing variation in DLL languages, ethnicities, races, levels of education, and migration stories which has important implications for future educational practice and policy (Park, Zong, & Batalova, 2018). Yet, demographic numbers still indicate that certain cultural identities are largely overrepresented in the U.S. DLL population. According to statistics collected between 2011 and 2015, 62% of DLL children are Hispanic and 65% of parents of DLLs are immigrants. In addition, 58% of DLL children grow up in low-income families (Park et al., 2018; Park et al., 2017). Thus, while acknowledging the growing superdiversity of DLLs, the research reviewed in

this study will address the largest identity representations of the U.S. DLL community (first-generation or second-generation immigrant, Latinx, low-income) that are currently reflected in national statistics and in the scientific literature.

Over the years, the growing presence of DLLs within U.S. schools has prompted empirical investigations into language development, teaching pedagogies, and education policy changes that address the specific learning needs of DLLs and encourage their academic success (Counts, Katsiyannis, & Whitford, 2018; Genesee et al., 2005). Despite these efforts, an academic achievement gap between DLL and non-DLL students has persisted for decades, even after DLL students have spent several years in U.S. schools (Ballantyne, Sanderman, & McLaughlin, 2008). Notably, national statistics show that in comparison to their non-DLL counterparts, DLLs achieve lower high school graduation rates, lower reading and math scores on standardized tests (McFarland et al., 2019), and are far less likely to attend colleges and 4-year universities (Kanno & Kangas, 2014).

Though a number of socioeconomic risk factors are hypothesized to contribute to discrepancies in achievement between DLL's and non-DLLs, including racial-ethnic minority status, immigrant status, socioeconomic status, and parental education level (Callahan, 2013; Perez, Espinoza, Ramos, Coronado, & Cortes, 2009); few studies have examined how stress perceived by DLLs may affect their academic functioning. Historically, studies on stressors for DLL students have focused on specific personal barriers (e.g., discrimination stress, acculturation stress, language anxiety) and structural barriers (e.g., socioeconomic challenges, educational inequity within the public school setting) (Cabrera, Burkum, & La Nasa, 2005; Counts et al., 2018; Hashemi, 2011; Rivera, López, Guarnaccia, Ramirez, Canino, & Bird, 2010) that can contribute to the achievement gap. Yet, a recent review of stress research (Thoits, 2010)

suggests that comprehensive or "global" measurements of stress, which are capable of capturing ongoing challenges not just the occurrence of itemized stressful events, can provide more accurate determination of the impact of stress (Thoits, 2010). Despite this finding, the only studies that have examined the impact of stress on academic functioning for DLLs using a global stress measure, such as the Perceived Stress Scale (PSS, Cohen & Williamson, 1988), have been previous studies (e.g., O'Neal, 2018; O'Neal, Boyars & Riley, 2019, Goldthrite, 2019) that utilized the same sample as the current study. Instead, stress in DLL students is typically assessed by type of stressor (e.g., discrimination stress) or with measures that use lists of itemized stressful events (Gillock & Reyes, 1999).

Since DLL students have been identified as a group that is impacted by the achievement gap, interest in understanding and promoting DLL academic engagement within the education literature has grown. Within the literature, academic engagement is comprised of varying dimensions of student's participation within the school environment; however, there is consensus among researchers that both the behavioral and emotional components of academic engagement are core features of the construct (Appleton et al., 2008; Fredericks, Blumenfeld, & Paris, 2004). In a recent report released by the Migration Policy Institute (Sugarman, 2019), academic engagement was named as a major factor that can contribute to higher school dropout rates for immigrant and DLL students. Research on academic engagement with DLLs support this statement, as academic engagement has been found to be a predictor of a variety of academic outcomes (e.g., GPA and teacher-rated achievement) for immigrant and U.S. born Latinx middle school and high school students (Herman & Tucker, 2000; Suárez-Orozco, Pimentel, & Martin, 2009).

Investigation into personal and environmental protective factors that can moderate the effects of stressors on academic functioning for DLLs can further our understanding of ways to support their academic success. A moderator is a variable that alters the strength of the relationship between an independent and dependent variable; in contrast, a mediator is a variable that explains how an independent variable impacts a dependent variable, with the design of the independent variable impacting the mediator, and the mediator impacting the dependent variable (Wu & Zumbo, 2008).The use of moderators is in line with academic resilience theory research design which is concerned with identifying risk factors and potential protective factors (i.e., moderators) that can buffer the negative effects of risk on academic functioning for students. Individual characteristics (e.g., having faith in own cognitive skills, valuing of school) and environmental social resources (e.g., support from parents, teachers, friends) have been frequently cited as instrumental moderators of risk factors on academic outcomes for Latinx students (DeGarmo & Martinez, 2006; Perez, Espinoza, Ramos, Coronado, & Cortes, 2009). Investigation into mediators in the relationship between stress and academic engagement for DLL students would be an alternative model that warrants future research. This research question would target factors that enable this cause-effect relationship to occur. Instead, the current study is concerned with moderators in this relationship that serve as protective factors in their ability to mitigate the negative effects of stress on academic engagement. Drawing on previous research related to the importance of resilience factors and academic support for Latinx DLL students, the following study will examine grit, teacher academic support, and peer academic support as potential protective factors that may mitigate the negative impact of perceived stress on academic engagement for this population.

The Current Study

This dissertation addresses gaps in the academic achievement literature for DLL students. Specifically, this study employs both stress and resilience theoretical frameworks to identify the individual and environmental protective factors that mitigate the impact of perceived stress on academic engagement for DLL students. This study uses a low-income, largely Latinx DLL student sample attending a Title I elementary school in the mid-Atlantic region of the U.S. I will test the potential protective factors of grit, teacher academic support, and peer academic support on the relationship between perceived stress and later behavioral and emotional academic engagement.

Chapter 2: Literature Review

The current study is the first to examine potential protective factors in the relationship between perceived stress and academic engagement for elementary-aged DLLs, a majority of whom are Latinx. Starting with background on the academic achievement gap and its relation to DLLs, the literature review will; (a) operationalize perceived stress; (b) review stress literature and relations between stress and academic outcomes, like academic engagement; and (c) review studies that indicate the potential moderating effects of grit, teacher academic support, and peer academic support.

The Achievement Gap

For decades, the academic achievement gap between students of color and White students is an issue that has remained at the forefront of education research (Jeynes, 2015). Broadly, the achievement gap is defined as observed differences in academic assessment data across groups of students, particularly when students are grouped by ethnic or racial background (Paige & Witty, 2010; Leavitt, 2015). This data shows that, across the U.S., students of color are more likely to demonstrate scholastic underachievement and this discrepancy continues to persist. Statistics from as recent as 2017, sourced from the National Center for Education Statistics, show that students of color are more likely to have lower GPA, standardized test scores, and high school graduation rates in comparison to their White counterparts (McFarland et al., 2019). While acknowledging the persistence of the academic achievement gap, data does indicate that the gap itself has shown varying levels of shrinkage over the years for certain groups. Data collected by the National Assessment of Educational Progress (NAEP) between 1978 and 2012 indicate general increases in scores across racial/ethnic groups. Nevertheless, when parsing DLL

and non-DLL students these gains are limited. Though differences in scores between Hispanic students and their White counterparts are narrower than those between Black and White students, gaps between DLL students and non-DLL students are noticeably larger (Leavitt, 2015; National Center for Education Statistics, 2013). In addition to tracking these statistics, a significant portion of educational research has been devoted to understanding why the academic achievement gap persists and what can be done to mitigate these factors. Despite years of research, there is little consensus on why the academic achievement gap remains.

While research that investigates how to close the achievement gap is often well-intentioned, a proportion of research on the achievement gap has relied on theoretical underpinnings that support the negative stereotyping and oppression of minority and low-income students' abilities and achievement, such as the cultural deficit model. The cultural deficit model is defined as the "belief that a students' and the students' family, social, cultural, and economic environment is lacking or is deprived, and this leads to poor academic achievement" (Bruton & Robles-Piña, 2009, p. 42). This perspective places the onus and blame on students, their culture, and their families for underachievement instead of holding educational systems and policies accountable. Overall, the most prominently cited contributors to the academic achievement gap that are positioned with the cultural deficit model are (a) family factors; (b) neighborhood factors; and (c) student characteristics. Neighborhood factors such as poverty (Lacour & Tissington, 2011) and low socioeconomic status are one of the most commonly cited drivers of the achievement gap (Burchinal et al., 2007). Sociocultural measures such as parenting style (Burchinal et al., 2011) are family factors have been posited to explain some of the variance in achievement gaps between White and minority students. Further, some research has even

explored student characteristics, such as student motivation, to explain why some students underperform (Schultz, 1993).

Focusing on these factors as drivers of the academic achievement can contribute to cultural deficit thinking among educators within the educational system, including those who work directly with students (e.g., teachers, administrators) to entire teacher training programs (Tatto, 1996; Valencia, 1997). In fact, a substantial number of studies have evidenced that some teachers engage in deficit thinking when describing their students' achievement (e.g., attributing their lower achievement to personal, family, or cultural factors), which can manifest in forms of discrimination (e.g., lower expectations for students), that can affect students' academic achievement (Bol & Berry, 2005; Ladson-Billings, 2007; Peterson, Rubies-Davies, Osborne, & Sibley, 2016). Therefore, critics of the cultural deficit model are pushing for research to focus instead on school factors, which are amenable to change, in place of outside of school factors or student characteristics (Solorzano, 1997). Indeed, studies indicate that school factors including teacher quality (Lankford, Loeb, & Wyckoff, 2002), school policies (Morris & Perry, 2016), and even contextual factors such as size and locale (Glennie, Bonneau, VanDellen, & Dodge, 2012) can have pertinent effects on culturally and linguistically diverse students' academic success. Together, these contributing factors to the academic achievement gap are also tied to what is known as the "push-out process" for minority students in the U.S. educational system. In particular, push-out theories focus on school factors, such as school practices and policies, that create active barriers to high school graduation (Glennie et al., 2012; Rumberger & Thomas, 2004). These policies may enforce consequences for academic underachievement, low attendance, or behavior issues in the form of suspensions, expulsions, or referrals to alternative programs (Glennie et al., 2012). Further, an unwelcoming school climate and negative attitudes

from school personnel may contribute to the push-out process (Glennie et al., 2012; Luna & Revilla, 2013). In a qualitative study on Latinx students' reasons for leaving school, though students often cited a number of reasons for their early departure from high school, the most prominent reason cited by students included discrimination and racial microaggressions (Luna & Revilla, 2013). For Latinx DLL students in the study, they often mentioned the extra burden of feeling alienated from those in the school because of language barriers as contributing to leaving school early (Luna & Revilla, 2013). Therefore, additional research into factors that contribute to the achievement gap for DLL students is imperative for understanding the unique barriers that are in the way for this population.

DLL achievement gap. Achievement gaps across U.S. schools are not limited to discrepancies in scores between racial, gender, or socioeconomic groups. DLL students have been consistently identified as a student group who is affected by the achievement gap (Suárez-Orozco & Suárez-Orozco, 2009). Further, DLLs are often not afforded the same levels of educational opportunity and access in the U.S. public school system as evidenced by their overrepresentation in special education programs (Cabrera et al., 2005; Counts et al., 2018) and disproportionate high school drop-out rates (McFarland et al., 2019). Thus, this section will explore statistics on the achievement gap for DLL students, identify unique contributing factors to the achievement gap that are apparent for DLL students, and provide evidence for increased scientific examination of the academic engagement of DLL students.

DLL students have been consistently identified as a portion of the U.S. student population at-risk for academic underachievement (Genesee et al., 2005; Suárez-Orozco & Suárez-Orozco, 2009). DLL learners are more likely to fall behind in core academic subject areas in comparison to their non-DLL peers (McFarland et al., 2019). According to data from a

national reading assessment administered in 2017, DLL students scored on average 36 points below their 4th grade non-DLL counterparts and this number increased to 43 points by 8th grade (McFarland et al., 2019). In the math equivalent of this assessment, 4th grade DLL students averaged 26 points lower and 8th grade DLL students averaged 40 points behind their non-DLL peers (McFarland et al., 2019).

Further, a significant portion of the literature on DLL students has sought to understand one of the most troubling statistics related to their academic achievement: high rates of high school drop-out. When examining nationwide high school graduation rates, which is an important predictor of economic opportunity, DLLs continue to fall behind their non-DLL peers. In the 2015-2016 school year, only 67% of DLLs graduated high school in comparison to an overall graduation rate of 84% for all U.S. students (Sugarman, 2019). This data demonstrates that as DLLs continue their education, divergence in a variety of academic outcomes between them and their non-DLL peers continue to grow, which highlights the need for increased attention to contributors of the achievement gap and ways to prevent these patterns of underachievement.

Academic preparation in high school is a major predictor of college access; however, studies indicate that DLLs are often not afforded the same opportunities for academic advancement in public schools as their non-DLL peers (Cabrera et al., 2005; Callahan, Wilkinson, & Muller, 2010; Kanno & Kangas, 2014) which can further widen the achievement gap. DLL students can face both structural and personal barriers to their learning in the school setting which impedes their academic achievement. A number of studies have indicated that DLL learners are less likely to be referred for or have the opportunity to take advanced level courses, honors courses, and have advanced placement (Cabrera et al., 2005; Callahan, et al., 2010;

Kanno & Kangas, 2014). In a qualitative case study on DLL education at a public high school in the U.S., researchers found that the consistent enrollment of DLLs into low-track, remedial-level courses restricted them enrolling in honors or AP courses later in high school (Kanno & Kangas, 2014) which altered the trajectory of their high school careers. In addition to these practical barriers, DLL students, Latinx students (Conchas, 2001; Keys Adair, 2015; Fisher et al., 2000) and undocumented students (Contreras, 2009) have also reported experiencing discrimination from their teachers or advisors in the form of lower teacher expectations or being discouraged to take high level courses which can serve as personal barriers to academic success.

Academic engagement. Academic engagement is an important academic indicator for students (Furrer & Skinner, 2003). It is correlated with academic success across all grade levels (Alrashidi et al., 2016; Fredericks et al., 2004; Shernoff & Schmidt, 2008) and is a predictor of a variety of achievement outcomes including grades, attendance, and high school graduation (Ream & Rumberger, 2008; Skinner, Furrer, Marchand, & Kindermann, 2008). In research, academic engagement is considered a multidimensional construct that describes students' various patterns in behavior, emotion, and cognition within the school context that reflect a positive approach to learning (Alrashidi, Phan, & Ngu, 2016). Inconsistency in the terminology of academic engagement used by researchers (e.g., student engagement, school engagement, classroom engagement) and definitions (e.g., two- or three-component models) have contributed to challenges in the conceptualization and measurement of academic engagement (Alrashidi et al., 2016; Appleton, Christenson, & Furlong, 2008). Despite this, a consensus exists among researchers that both a behavioral (e.g., involvement in academic tasks or extracurriculars, following rules) and an emotional component (e.g., interest in school) are critical for interpreting academic engagement (Appleton et al., 2008; Fredericks et al., 2004). Therefore, this paper

operationalizes academic engagement as a "student's active participation in academic activities in the classroom" (Skinner et al., 2008, p.766) using a two-component model of behavioral and emotional engagement. Following Skinner and colleague's (2008) definitions, behavior engagement is defined as "students' effort, attention, and persistence during the initiation and execution of learning activities" (Skinner et al., 2008, p. 766). Emotional engagement refers to "states that are germane to students' emotional involvement during learning activities such as enthusiasm, interest, and enjoyment" (Skinner et al., 2008, p. 766).

Similar to other achievement constructs, academic engagement is viewed as a malleable construct that is subject to social, academic, or intellectual influences (Fredericks et al., 2004). For instance, studies show that students' levels of academic engagement can be influenced by a number of factors, including support from significant others (e.g., teachers, peers) alongside environmental and personal stressors (as reviewed below) (Hughes, 2011; Perry, Liu, & Pabian, 2010; Tucker et al., 2002; Raufelder, Kittler, Braun, Lätsch, Wilkinson, & Hoferichter, 2014). In fact, decreases in academic engagement for students can be seen as early as kindergarten (e.g., being withdrawn or silent), with sharper declines occurring in fourth to seventh grade, leading to premature school dropout by tenth grade (Balfanz et al., 2007). Students who demonstrate low academic engagement are often characterized as being academically disengaged, illustrated by a lack of involvement and commitment to school (Sun, 2016). These students are more likely to drop out of school, receive lower grades, and even experience negative psychological outcomes (Sun, 2016). Therefore, while academic engagement and academic achievement are often viewed as separate constructs, they are often highly correlated (Sun, 2016).

Academic engagement for DLLs. Evidence of unequal educational opportunity coupled with disproportionate high school drop-out rates for DLLs has spurred additional research into

the importance of addressing and understanding the academic engagement of DLL students (Callahan, 2013; Sugarman, 2019). On top of this, Latinx and immigrant DLLs may face a variety of unique stressors related to their social identities, such as racial discrimination or language anxiety, that can negatively affect elements of their academic functioning in comparison to their non-DLL peers (Benner & Graham, 2011; Foxen, 2010; Hashemi, 2011). Indeed, evidence of lower levels of academic engagement for Latinx students in comparison to their White counterparts has been found, however results are mixed. In one study that investigated how classroom activities affected academic engagement (i.e., paying attention, listening, motivation, interest) and if differences in academic engagement existed among ethnic and racial groups, Latinx high school students were found to have the lowest engagement score across all racial and ethnic groups (Uewaka, Borman, & Lee, 2007). In another study that compared school engagement (e.g., homework activities, school preparation, athletics and art preparation) between eighth grade Mexican-American students and non-Latinx white students (Ream & Rumberger, 2008), Mexican-American students demonstrated lower levels of academic engagement, though the researchers noted that these differences were not significant. Therefore, further investigation into potential factors that can affect the academic engagement of DLL students is needed.

In an effort to extend the research on the contributing factors of the achievement gap between DLLs and non-DLLs, this study will focus on academic engagement, specifically emotional and behavioral academic engagement, as an outcome. Since DLL students face additional personal, institutional, and environmental barriers to educational achievement and opportunity, increased attention should be paid to potential risks or protective factors that can influence their academic engagement.

Theoretical Framework

This paper relies on two theoretical frameworks: Masten's risk and resilience model (2004) and Lazarus and Folkman's (1984) transactional model of stress. The application of these frameworks to DLL learner students, particularly low-income Latinx and immigrant students, is addressed below.

Children can face a number of risks in their environment that can sabotage their development, including stress (Matheny, Aycock, & McCarthy, 1993). In the context of academic development, prominent risk factors for academic underachievement include being an ethnic minority, attending an inner-city school, being from a low-income family, and living in a home with a primary language other than English (i.e., DLL; Perez et al., 2009) which can function as sources of stress for children. In their transactional model of stress, Lazarus & Folkman (1984) indicate that there are two important factors to understanding stress: appraisal and coping. They posit that psychological stress is viewed as a transaction between an individual, such as a child, and their environment (e.g., school, home). In this appraisal process, when a child recognizes that the demands from their environment exceed their resources, they can perceive stress (Krohne, 2001). In line with Lazarus' theory, a balance of demands and resources is generally considered to lead to an individual experiencing an increased sense of control, which can serve as a protective factor. This association is especially important to consider in the life of a child, since children often are not in positions of control in the home or school environment (Matheny et al., 1993).

In her risk and resilience model, Masten (2004) examines how family, school, community, and child factors interact with problems inherent in a child's life. In particular, Masten examines the concept of resilience, which is a positive outcome resulting from human

adaptation that occurs in the face of risk (Masten, 2001). This resilience framework, particularly within the context of academic resilience, has frequently been examined with vulnerable student populations (e.g., ethnic minority, low-income) and has important implications for the educational success of DLL students (Rivera & Waxman, 2011). Based on a developmental perspective, a major task of Masten's (1988, 1994, 2004) risk and resilience theory is identifying protective factors, both personal and environmental, that can serve as a buffer for the child by lessening the impact of these risk factors that can sabotage a child's development. Personal factors have been described as "personality characteristics and attitudes that children possess" whereas environmental resources are associated with "information or actual supportive behaviors" from others (Alva et al., 1995, p. 4). The examination of both types of these protective factors is important for understanding the processes by which healthy development is promoted and maladjustment is thwarted (Alva et al., 1995; Masten, 1988; Perez et al., 2009).

Using both Masten's risk and resilience (2004) model and Lazarus and Folkman's (1984) model, I am proposing that perceived stress experienced by children functions as a risk factor due to its negative effects on a child's academic wellbeing, specifically their academic engagement. The negative impact of perceived stress on academic engagement may be affected by varying levels of personal (i.e., grit) and environmental factors (i.e., academic support from teachers and peers). This model is related to Masten's (2004) risk and resilience model in that I am proposing that these personal and environmental factors can simultaneously function as protective factors in the relationship between perceived stress and classroom engagement for DLL students. Further, this model is connected to Lazarus and Folkman's (1984) transactional model of stress through examining how the effects of perceived stress is affected by interactions between DLL students and their school environment, including the support they receive from

their teachers and peers. Further investigation into these processes is important for increased knowledge on potential protective factors in the relationship between perceived stress and children's academic outcomes, in this case low-income, Latinx DLL students, which can inform the development of appropriate prevention and intervention strategies for this population (Luthar et al., 2000).

Perceived Stress

Stress has been acknowledged as an inescapable reality of human life at nearly every stage of development (e.g., childhood, adolescence, adulthood) in every context (e.g., workplace, school, relationships) (Shahsavarani et al., 2015). The significant negative effects of stress on wellbeing, particularly on physiological and psychological health, have been well-documented (Thoits, 2010). Within Thoit's (2010) review of stress research, she highlights important findings related to the variations in the measurement of stress and how it's experienced among different populations that are integral to informing future studies. First, studies suggest that comprehensive or "global" measurements of stress, which are capable of capturing ongoing challenges not just the occurrence of itemized stressful events, can provide more accurate determination of the impact of stress (Thoits, 2010). Earlier studies on stress focused on the quantity of a rater's endorsement of specific, discrete stressful life events (e.g., death of a spouse, being fired) to measure stress (Cohen & Williams, 1988). Yet, studies that used stressful life events scales are viewed as limited in that they do not account for chronic, day-to-day stressors (e.g., monthly bills, interpersonal conflicts), do not account for events that were not included in the scale, and often do not take into account the rater's perception of how stressful these events were for them (Cohen & Williams, 1988; Thoits, 2010).

Second, the distribution of stress, both in type and severity, is unequal across different populations (Thoits, 2010; Williams, Yu, Jackson, & 1997). Studies indicate that demographic factors such as age, gender, race, and socioeconomic status have all been implicated in findings of disproportionate levels of distress or illness among populations (Thoits, 2010). In addition, studies on the relationship between distress and age have evidenced a curvilinear relationship, with increases in stress in found in adolescence, young adulthood, and older age, and a decrease in stress occurring in middle-adulthood (Thoits, 2010). Further, studies that have compared stress between ethnic and racial groups and their White counterparts have shown that ethnic minorities face higher levels of stress than Whites (Alegria, Alvarez, & DiMarzio, 2017) in addition to experiencing varying forms of racial discrimination due to their minority status (Banks Kohn-Wood, & Spencer, 2006; Forman, Williams, & Jackson, 1997). In addition, the use of objective measures of stress (i.e., life events measures) with minority populations may contribute to these discrepancies. In a study on the utility of different types of stress measures between young adult (ages 18-22) African-Americans and Whites, though African-Americans reported higher levels of stress in every other measure of stress (i.e., chronic stress, total lifetime major events, lifetime major discrimination, and daily discrimination) the recent life events measure was found to significantly underestimate the exposure to stress for African-American participants (Turner & Avison, 2003). In essence, checklist measures may underestimate stress levels for ethnic or racial minority raters. Therefore, as empirical investigations into stress continue to evolve, it is important that researchers acknowledge the myriad of ways in which stress can be experienced, expressed, and measured across different populations (Shahsavarani et al., 2015; Turner & Avison, 2003).

In acknowledgement of the findings in stress research that were explained above, Cohen & Williamson's (1988) 10-item Perceived Stress Scale (PSS-10) will be used in this study to measure perceptions of stress for Latinx, low-income DLL elementary-aged students. In this study, perceived stress is defined as "the degree to which situations in one's life are appraised as stressful" (Cohen, Kamarck, & Mermelstein, 1983, p. 385). It is as a global measure of stress that evaluates the degree to which respondents have felt overwhelmed. On the PSS-10, raters are asked about their current levels of experienced stress in addition to answering general questions about their perceptions of their reactions to these stressful experiences (i.e., "In the last month, how often have you been upset because of something that happened unexpectedly?") (Cohen et al., 1983). The benefits of using a perceived stress scale in comparison to a measure of stress that targets specific stressful life events is that it (a) can provide further information on the appraisal processes that are involved in the interaction between the individual and their environment; and (b) forgoes the assumption that a rater who endorses more stressful life events has more stress; (c) can potentially capture a wider variety of stressors through the omission of a predetermined stressful life events checklist (Cohen et al., 1983). Altogether, the assumption of a perceived stress scale is that the individual's appraisal of their stress is the most important aspect when judging individual stress (Cohen et al., 1983). Additional research on the relationship between perceived stress and academic functioning for DLLs is explored in more detail below.

Perceived stress and the achievement gap. Stress can impede a student's academic performance by diverting attention away from cognitive tasks (Matheny et al., 1993). Particularly, a considerable portion of research has been conducted on the link between stress and areas of cognition (Sandi, 2013) such as attention, memory, and executive functioning, which are important functions for academic tasks (Levy et al., 2016). Though a number of

studies have documented the detrimental effects of stress on academic achievement (Akgun & Ciarrochi, 2003; Alva and de Los Reyes, 1999; Gillock & Reyes, 1999; Kaplan, Liu, & Kaplan, 2005), few have examined this relationship with a global measurement of stress, such as the Perceived Stress Scale (PSS) (Cohen et al., 1983). Studies that have examined the effects of stress using the PSS have found significant negative correlations between perceived stress and academic performance, measured by GPA (Schmeelk-Cone & Zimmerman, 2003; Talib & Zia-ur-Rehman, 2012) and grades (Sanders & Lushington, 2001), for high school or postsecondary students. Despite evidence that children as young as six years old are capable of self-reporting their stressors and coping experiences (Band & Weisz, 1988) studies on stress for younger populations have largely focused on advanced developmental periods including adolescence, the transition to high school or college, and young adulthood with limited studies on elementary-aged students (Sotardi, 2016). Further, most studies on stress that sample elementary-aged students focus specifically on school-based stressors (e.g., Bauwens & Hourcade, 1992) or use stressful life events scales (e.g., Morales & Guerra, 2006) to gather information on stress for these populations. Currently, the only studies that have examine perceived stress for elementary-aged students has come from research conducted in our Emotions, Equity, and Education lab that utilized the same DLL sample that is used in the current study. In one study, O'Neal (2018) found that perceived stress reported by DLL elementary students had a negative impact on later literacy achievement through the mediator of teacher-reported emotional engagement, while grit was not found to be a significant mediator. This study is the first to provide evidence that perceived stress for DLL elementary students can have a negative impact on their academic functioning.

Stress has been found to impact other academic outcomes apart from GPA and grades, including students' academic engagement. Despite consensus among researchers that academic engagement is highly correlated with academic achievement and vital for school completion (Appleton et al., 2008) there are very few studies that have examined the effects of perceived stress on academic engagement for students. Currently, there are only three studies that have specifically examined the effects of perceived stress on engagement, all of which completed with participants who were in adolescence or young adulthood (Raufelder et al., 2014; Serrano & Andreu, 2016; Thomas & Borrayo, 2012). Each of these studies have used Cohen and colleagues' (1983) Perceived Stress Scale, with the exception of Serrano & Andreu (2016) who used the Spanish-version of the scale with Spanish adolescents. In addition, each of the three studies have examined differing definitions of academic engagement outcomes. In a study by Serrano & Andreu (2016), perceived stress reported by Spanish adolescents was negatively correlated with their academic engagement measured by the Utrecht Work Engagement Scale for Students (UWES-S) (Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002). Thomas and Borrayo's (2012) study on the impact of perceived stress on absenteeism showed that college students who had reported higher levels of perceived stress were more likely to miss class, particularly if they reported less social support. A study by Raufelder, Kittler, Braun, Lätsch, Wilkinson, and Hoferichter (2014) is the only study that explores the effects of perceived stress on outcomes of behavioral and emotional engagement. In this study, seventh and eighth grade German students who reported higher rates of perceived stress showed decreased school engagement, measured by the behavioral and emotional engagement scales (Skinner et al., 2009) that are used in the current study. The aforementioned studies provide evidence that stress assessed by global measures, not just specific stressors, can have a negative effect on a variety of

academic indicators, including their academic engagement, among adolescents and young adults but additional research with elementary-aged populations and DLL students is needed.

Perceived stress and DLLs. Culturally and linguistically diverse children, (e.g., first- or second-generation immigrant children, Latinx children, and children from low-income families) have been identified as being more likely to experience high levels of stress and mental health challenges (Alegria et al., 2017; Isasi, Rastogi, & Molina, 2016). Statistically, non-White students are more likely to face socioeconomic challenges including living in a one-parent home, living in poverty, having parents with lower levels of educational attainment (McFarland, 2019), reporting increased rates of neighborhood violence (Bowen & Bowen, 1999), and experiencing food insecurity (Myers & Painter, 2017). For DLLs and immigrant students in particular, they may face additional challenges with acculturation stress (Roche & Kuperminc, 2012; Albeg & Castro-Olivo, 2014) and language anxiety (Hashemi, 2011), both of which have been implicated as significant threats to academic achievement (Levy et al., 2016).

DLL and immigrant students are often burdened with numerous stressors from outside of the school setting (e.g., poverty, segregation, less parental education, language brokering, immigrant status) and inside (e.g., lower teacher expectations, discrimination, learning English, segregation by language or race) that can undermine their academic performance (Benner & Graham, 2011; Roche & Kuperminc, 2012; Suarez-Orozco & Suarez-Orozco, 2009). From their parents, Latinx and immigrant students have reported high pressure to perform academically, increase their social skills, and to bolster the success of their families (Foxen, 2010). From teachers, peers, and even strangers, culturally and linguistically diverse students have reported stressors that are directly related to their sociocultural identities in the U.S., including discrimination stress, stereotype threat (i.e., risk of confirming negative stereotypes about one's

social group), and bicultural stress (i.e., stress experienced from living between two cultures) (Foxen, 2010; Mikolajcyzk, Bredehorst, Khelaifat, Maier, & Maxwell, 2007; Piña-Watson, Dornhecker, & Salinas, 2015; Potochnick & Perreira, 2011). For example, there is an extensive literature base that documents how ethnic, racial, and language discrimination from teachers and peers toward DLL, Latinx, and immigrant students (e.g., Benner & Graham, 2011; DeGarmo & Martinez, 2006; Edl, Jones, & Estell, 2008; Rolon-Dow, 2005) can have a negative effect on academic outcomes. In a study on Latinx students from middle school and high school, discrimination experienced within the school setting had a significant negative association with academic well-being (DeGarmo & Martinez, 2006). Teacher biases toward students may be particularly salient for DLL students, who are often faced with additional challenges and stereotypes associated with learning a second language. For instance, in a study comparing teacher ratings of academic competence of White and Latinx students in both regular and bilingual classrooms, teachers consistently rated Latinx students in bilingual classrooms as being less academically competent (Edl, Jones, & Estell, 2008). For immigrant students, stress related to documentation status, immigrant stress, and acculturation can have damaging impacts on their psychological health and academic wellbeing (Alegria et al., 2017; Potochnick & Perreira, 2011).

Despite a significant proportion of studies on individual stressors for culturally and linguistically diverse children, profound gaps in stress research continue to exist**.** First, most studies that examine the relationship between stress and achievement are limited to cross-sectional designs that exclude elementary-aged children and children from culturally and linguistically diverse backgrounds (Levy et al., 2016). Second, despite the variety of personal, social, and socioeconomic challenges faced by DLL students that have been illustrated above, at this time there are few studies that has utilized perceived stress (O'Neal, 2018; O'Neal et al.,

2019) with this population. For DLLs, the use of a perceived stress scale may capture a wider range of stressful experiences that they encounter in comparison to a measure of a particular stressor or the frequency of stressful life events. Third, despite evidence of significant negative correlations between perceived stress and teacher-reported emotional engagement in O'Neal's (2018) study, there are currently no studies that have examined the impact of perceived stress on academic engagement for DLL students. I aim to address these limitations in the research by utilizing a measure of perceived stress in an effort to capture a wider range of potential stressors and the psychological impact of those stressors that elementary-aged DLL students may face. Further, I will explore potential protective factors that may moderate the effects of perceived stress on their academic engagement.

Potential Protective Factors

Grit. Within the past ten years, grit has quickly grown into one of the most popular new phenomena in psychology. Grit is defined as the "trait-level persistence and passion for long-term goals" (Duckworth & Quinn, 2009). It has been identified as a personality trait with two distinct factors: consistency of interest and perseverance of effort (Duckworth & Quinn, 2009). Both domains are imperative to capturing the essence of grit; determining consistency of interest helps to weed out sustained efforts toward a goal for extraneous reasons (e.g., fear of change, compliant with expectations of others, unaware of alternative options) and perseverance of effort demonstrates that an individual has sustained their efforts even when faced with adversity (Duckworth, Peterson, Matthews, & Kelly, 2007). However, grit has been criticized for its similarities to other well-known constructs in the achievement literature, including conscientiousness (Duckworth et al., 2007), and self-control (Duckworth & Gross, 2014). Perhaps the most unique characteristic of grit that separates it from other constructs is the

duration of effort that is seen across time. For example, when considering comparisons between grit and self-control, self-control chiefly deals with lower-level, in-the-moment goals whereas grit is working toward higher-level goals over extended periods of time (Duckworth et al., 2007). In addition, grit is not only concerned with the amount of effort that is expended on a task, as is the case with an individual who is conscientious, but the effort that is maintained in the pursuit of high-order goals (Duckworth & Gross, 2014; Eskreis-Winkler, Shulman, Beal, & Duckworth, 2014).

In this study, grit is operationalized according to the definition proposed by Duckworth and colleagues' (2007) work and is measured by a modified teacher-report version in addition to the original student-report version of the Short Grit Scale (Grit-S) (Duckworth & Quinn, 2009). Grit was chosen for this study for its two-factor structure, which can capture the maintenance of interest that is expected for academic engagement alongside sustained efforts in the face of adversity (e.g., stress). In a previous study (O'Neal et al., 2019) that examined the factor structure of the teacher and peer report version of the grit scale with the DLL sample used in this study, a two-factor structure fit best. In addition, grit may serve as a personal factor within an academic resilience framework, where personal and environmental protective factors buffer the impact of negative risk factors for at-risk students (Perez et al., 2009). It is important to note that grit has received some criticism when it has been applied to at-risk, low-income, or minority students due to its "'success through hard work' component of the American Dream master narrative" (Syed, Santos, Yoo, & Juang, 2018, pp.18) that posits that the absence of grit is a personal shortcoming. However, the current study will examine grit through a risk and resilience framework that accounts for both personal (grit) and environmental factors (teacher and peer academic support) that can buffer the effects of stress for students.

Grit and Academic Outcomes. Grit's reputation as a predictor of success and performance is largely due to its association with a variety of long-term markers of achievement (Credé, 2018; Duckworth & Quinn, 2009; Eskreis-Winkler et al., 2014; Wolters & Hussain, 2014). For example, grit has also been associated with common academic outcomes for students such as GPA, SAT scores, and level of education (Duckworth et al., 2007; Duckworth et al., 2009). In their study that validated the Short Grit Scale (Grit-S), Duckworth and colleagues (2007) found that adult's education attainment and grit were positively correlated; adults who had gone further in their education and made fewer career changes rated themselves as having more grit. Further, they found that middle and high school students attending a magnet public school that reported more grit tended to earn higher GPAs and watched fewer hours of television. These findings mirror those of Duckworth and colleagues' (2007) study that validated the full Grit scale. In their study, they found that grit scores for undergraduate psychology students at an Ivy League school were positively associated with GPA and SAT scores (Duckworth et al., 2007). However, other studies have found no relation between grit and future academic outcomes. For example, in a study on the predictive value of certain non-cognitive skills, grit was not predictive of college students' GPA (Chang, 2014). In a study by Ivcevic and Brackett (2014), grit was also not predictive of recognition, academic honors, and GPA for high school students. This indicates some inconsistency in the relation between grit and achievement, though it is important to note that this relationship has mostly been studied with adults, undergraduate students, or exceptionally high-achieving primary or secondary school students.

Grit has also been linked to social-cognitive constructs related to achievement such as self-regulated learning, and engagement (Muenks, Wigfield, Yang, & O'Neal, 2017; Wolters & Hussain, 2015). In the first study to link grit with college student's self-regulated learning,

perseverance of effort emerged as a strong positive predictor of GPA, with self-regulated learning serving as a mediator (Wolters & Hussain, 2015). In a study that examined how grit compared to other related constructs (e.g., conscientiousness, self-control, cognitive self-regulation, effort regulation, behavioral engagement, and behavioral disaffection), findings indicated that high school juniors' grit showed an overlap with self-control, self-regulation, and behavioral engagement (Muenks et al., 2017). In the case of behavioral engagement, researchers hypothesized that this was due to similar items appearing between both the grit and behavioral engagement scales. Though these similarities are noted, it is important to add that few studies have explored the relation between grit and behavioral engagement. In addition, recent research completed by O'Neal, Goldthrite, Riley, and Atapattu (2018) and O'Neal (2018) has found significant positive correlations between teacher-reported grit and teacher-reported emotional engagement for the present elementary-aged DLL sample. These studies provide evidence that grit may be related to both behavioral and emotional components of academic engagement.

Grit and DLLs. Though few studies on grit have examined its utility with culturally and linguistically diverse students, there is evidence that grit may be positively related to achievement for these students (Eskreis-Winkler et al., 2014). For example, in a study that oversampled African American students in their junior year from Chicago Public Schools, students who self-reported higher levels of grit were more likely to graduate one year later, even when controlling for demographic variables (i.e., gender, race, SES) and common indicators of graduation such as school motivation and academic consciousness (Eskreis-Winkler et al., 2014). In a study that examined the predictive validity of grit on Black male college students' grades, grit emerged as a better predictor than high school GPA or ACT scores (Strayhorn, 2014). Further, grit has also been found to predict forms of achievement for Latinx populations. In a

study on Mexican-American high schoolers, Piña-Watson and colleagues (2014) found that grit, alongside hope and *familismo* (i.e., belief that connections with family and fulfilling obligations to support family is essential) predicted academic motivation. Based on these findings, it is possible that grit for DLL students may be associated with their academic functioning.

Similar to previous findings in the relation between grit and achievement among other culturally diverse populations, grit may hold a particular utility for DLLs. DLLs are often faced with multiple challenges both at home and at school including discrimination stress, language anxiety, and acculturative stress, which can act as barriers to their academic success (Albeg & Castro-Olivo, 2014; Levy et al., 2016; Roche & Kuperminc, 2012). Between the 1980's - 1990's, a rise in research into academic resilience among students who are disproportionately exposed to risk factors highlighted that certain personal protective factors played a part in academic resilience (Perez et al., 2009; Rivera & Waxman, 2011). Studies of academic resilience for Latinx children in particular have highlighted that protective factors for resilient Latinx students include social problem-solving skills and persistence (Alva et al., 1995). For undocumented students, the many challenges associated with immigration stress and financial burdens have resulted in a common theme within the community of having "*ganas*" or the "will or determination to achieve" despite hardships (Contreras, 2009, p. 625). Therefore, despite limited evidence of grit with culturally and linguistically diverse populations, constructs that are related to aspects of grit (e.g., problem-solving skills, having "*ganas"*) have been found to be relevant to these populations.

Currently, there are only a handful of studies that have specifically examined grit for DLLs. In a study that examined the relations between grit and achievement in academic subjects, researchers found that grit reported by Latinx DLL fourth and fifth graders was positively related

to their math and language arts achievement (Banse, 2017). Further, O'Neal (2018) found that grit had a significant impact on later literacy achievement through the mediator of academic engagement and age as a moderator (O'Neal, 2018). Collectively, these findings indicate that grit is positively associated with varying forms of academic achievement, including academic engagement. Further, when grit has been examined with DLL samples there is evidence of a positive impact on academic functioning. Yet, at this time, there is only one study that has demonstrated grit's potential as a moderator with DLL students. Goldthrite (2019) found that grit was a significant moderator in the relationship between perceived stress and reading achievement among DLL students. At this time, to my knowledge, there are no studies that have investigated grit's potential as a moderator in the relationship between perceived stress and academic engagement for DLL students.

Academic support. Academic support is a type of social support, which is often regarded as one of the most important elements of classroom climate (Johnson, Johnson, Buckman, & Richards, 1985). In this study, academic support is operationalized as how much a student perceives that their teachers and peers care about how much they learn and wish to help them learn (Johnson et al., 1985). Support from teachers and peers, typically in the form of social support, has an extensive history in school literature and has been linked with school engagement (i.e., school compliance, participation in extracurriculars, school identification, subjective value of learning), school belonging, internalizing problems, externalizing problems, and academic performance (Antaramian, Huebner, Hills, & Valois 2010; Banse, 2017; Wang & Eccles, 2013). However, there is limited literature on the benefits of academic support in particular. The current study focuses on the potential protective effects of academic support within the school system for elementary-aged DLL students, particularly from their teachers and peers.

Both teachers and peers play important roles in providing support to students by assisting their academic needs while facilitating interpersonal relationships (Johnson et al., 1985). Conceptually, teachers and peers have been theorized to provide varying types of support which can aid students' academic functioning. For example, support from teachers may look more like social support by providing emotional validation, spending time speaking with their students, or showing they care about their students' well-being. Teacher academic support is often characterized by praising students' effort, correcting their mistakes on their schoolwork, and caring about their learning. In comparison, forms of social or academic support from peers may come in the form of offering help when faced with challenges, helping with homework, and showing support of a students' academic endeavors (Gonzalez & Padilla, 1997; Johnson et al., 1985; Moreira et al., 2018).

The benefits of support from teachers and peers have often been explored in studies in relation to students' levels of stress (Han & Yu, 1996; Licita-Klecker & Waas, 1993; Snoeren & Hoefnagels, 2014; Torsheim, Aaroe, & Wold, 2003; Torsheim & Wold, 2001). Studies on the relation between stress and social support indicate significant correlations (Han & Yoo, 1996; Gillock & Reyes, 1999) though evidence with children is lacking in comparison to adults (Snoeren & Hoefnagels, 2014). In a study on school-related stress and social support for secondary school students, those who reported a higher level of stress at baseline tended to report more stress and less social support six months later (Torsheim & Wold, 2003). Despite evidence from multiple studies on the association between stress and social support, there are few studies that have examined academic support from teachers and peers in relation to stress experienced by children.

Academic support and academic outcomes. The role of social support in promoting indicators of academic achievement, particularly academic engagement, has an extensive history in the scientific literature (e.g., Anderson, Christenson, Hughes, Sinclair & Lehr, 2011; Li, 2018; Roorda, Koomen, Spilt, & Oort, 2011; Crosnoe, Johnson, & Elder, 2004; Wu, Hughes & Kwok, 2010). The effects of varying types of support from teachers and peers on select populations of students has received special attention. For example, a considerable portion of literature has focused on the benefits of teacher and peer support on the academic functioning of ethnically and racially diverse students (e.g., Crosnoe et al., 2004; Ghaith, 2002, Li, 2018). Specifically, academic support from teachers and peers reported by adolescent students of color has been positively linked with a host of academic outcomes including academic motivation, GPA, math and English grades (e.g., Alfaro, Umaña-Taylor, & Bámaca, 2006; Fuligni, 1997; Gonzalez & Padilla, 1997). In addition, studies on first-generation immigrant students show that those who reported increased parental and peer academic support studied more frequently than their third-generation immigrant peers (Fuligni, 1997). These studies highlight a number of findings that support the positive associations between varying forms of social support, including academic support, and academic outcomes. Further, it is important to note that these relationships have been evidenced for ethnically and linguistically diverse youth.

Social support from teachers has been linked with engagement in addition to academic achievement. Longitudinal studies on the effects of teacher-student relationships on academic functioning show that engagement serves as a mediator (Hughes, Luo, Kwok, & Loyd, 2008; Liem & Martin, 2011; O'Connor & McCartney, 2007). Further, studies have also shown a direct relationship between forms of social support and academic engagement (e.g., Perry, Liu, & Pabian, 2010; Tucker et al., 2002; Wang & Eccles, 2012). This relation has particular importance

for students who are at increased risk for disengagement and school dropout, including racial and ethnic minority students and DLL students (Callahan, 2013; Sugarman, 2019). For example, in a study on African American students in first grade through 12th grade, findings showed that students who reported their teachers as more interested and involved also reported increased academic engagement (i.e., emotional engagement, centrality of school, effort, attention, beyond the call) in the school environment (Tucker et al., 2002). In addition, social support perceived by ethnic and racial minority students may have effects on later academic engagement (Wang & Eccles). For example, in a study that oversampled African American students, Wang and Eccles (2012) found that varying forms of social support (e.g., teacher, peer, parent) predicted differential declines in certain areas of school engagement (i.e., school compliance, school identification, extracurricular activities, valuing of learning at school). Particularly, researchers found that teacher social support had a greater impact on emotional (e.g., school identification) and cognitive engagement (e.g., valuing of learning at school) than peer social support. In comparison, peer social support was a stronger predictor of behavioral engagement (e.g., school compliance, extracurricular activities).

Academic Support and DLLs. Social support has a long history in the scientific literature as playing an important role in the academic success of Latinx and immigrant students (e.g., Brewster & Bowen, 2004; Garcia-Reid et al., 2005; Gillock & Reyes, 1999; Li, 2018; Suarez-Orozco et al., 2009; Woolley, Kol, & Bowen, 2009). This may be due to findings that Latinx and immigrant students often report receiving support from their parents, teachers, peers, and other important figures in their lives (Muller, Katz, & Dance, 1999). Yet, in a review of research on teacher-student relationships, engagement, and achievement between Latinx and non-Latinx youth, Li (2018) found no significant differences between these two groups. Overall, Li (2008)

found that both teacher emotional support and instrumental health were positively associated with student's behavioral engagement, and this relationship was stronger than the relationship between teacher support and academic achievement.

Interestingly, a number of studies have evidenced positive associations between varying sources of social support and academic engagement for Latinx middle school students (Brewster & Bowen, 2004; Garcia-Reid et al., 2005; Wooley et al., 2009). In their study that examined the relation between social support and academic outcomes for Latinx middle school students, Woolley and colleagues (2009) found that parent and peer support had a direct effect on school behavior and school satisfaction. In addition, within a largely immigrant sample of Latinx students in an urban middle school (Garcia-Reid et al., 2005), support from others (e.g., teacher, parent, friend) had a direct, positive impact on academic engagement (measured by a student's commitment to the school process). In essence, Latinx youth who reported greater frequency of supportive behaviors from teachers, parents, and friends tended to have higher school engagement scores. Further, environmental variables such as neighborhood youth behavior (positive behaviors of other youths in the neighborhood) and neighborhood safety (self-reported experiences with crime and violence) were shown to have indirect effects on academic engagement through its effect on social support (Garcia-Reid et al., 2005). In another study by Brewster and Browen (2004), they found that as Latinx middle and high school students' perceptions of teacher support increased, problem behavior (behavior engagement) decreased while school meaningfulness (emotional engagement) increased.

In comparison to studies on social support, there are few studies that specifically examine academic support for culturally and linguistically diverse children. However, there is increasing evidence that academic support is distinctive from social support. In a qualitative study that

examined Latinx and White high school students' perceptions of teacher care, Latinx high-school students indicated that they preferred academic support over social support from their teachers (Garza, 2009). In a study on Mexican adolescents, teacher academic support was found to be the most important predictor of academic satisfaction and GPA (Plunkett, Henry, Houltberg, Sands, & Abarca-Mortensen, 2008). These studies indicate that in addition to academic support's positive effects on academic achievement, it may be a unique source of support for DLL students. While these studies have demonstrated a link between academic support and positive academic outcomes for Latinx students, the current study is the first to examine the potential of academic support as a protective factor for Latinx, immigrant DLL students in the relationship between stress and academic engagement.

Age and Gender

Control variables in the stress literature typically include sex and socioeconomic status (SES). A common theme in studies on stress has been that women and individuals from lower SES backgrounds experience different types of stress more frequently than their counterparts and/or report more frequent perceptions of stress (Thoits, 2010). In comparison, studies that have examined the relation between stress and age have reported curvilinear correlations, with increased stress in adolescence and young adulthood, lower stress in middle adulthood, and more stress in elder years (Thoits, 2010).

In the engagement literature, there have been mixed results when controlling for age and gender. In a study on that explored patterns in student's engagement across gender, grade levels, subject matter, and race, Marks (2000) found that girls were more academically involved than their male counterparts across elementary, middle, and high school. However, other studies have found no differences in academic engagement between genders (Suarez-Orozco et al., 2009).

Despite lack of unanimity regarding the relation of these variables, there is evidence of trends in correlations between age and gender which has motivated studies involving stress and engagement to control for these variables. Therefore, age and gender will be controlled as potential covariates within this study.

Contribution of this Study to the Literature

This study addresses the limitations found in the current literature in the following ways: (a) utilizes a longitudinal approach in acknowledgement of the dearth of longitudinal studies in the scientific literature on DLLs (Genesee et al., 2005); (b) expands on the limited literature on perceived stress in elementary-aged students and DLL students in comparison to adults; (c) expands on the limited literature that examines protective factors in the relation between perceived stress and academic engagement for elementary-aged students in addition to DLL students; (d) utilizes both teacher-report and student-report variables. Most importantly, this study is, at this time, the first to investigate potential protective factors that moderate the relationship between perceived stress and academic engagement for elementary-aged DLL students.

Questions and Hypotheses

The current study investigates the relationship between perceived stress and academic engagement for elementary-aged Latinx DLL students, and if this relationship is moderated by individual and environmental protective factors, specifically grit, teacher academic support, and peer academic support. My research questions and hypotheses are as follows:

1. Model 1: What is the relationship between perceived stress and academic engagement for DLL students?
    a. Prediction: Perceived stress will be inversely related to academic engagement.

2. Model 2: Which moderators will serve as protective factors in the relationship between perceived stress and academic engagement for DLL students?
    a. Prediction: Grit, teacher academic support, and peer academic support will moderate this relationship.

Chapter 3: Methods

The current study is a short-term longitudinal study using a sample of DLL students from a Title I elementary school in Maryland. Parent consent and student assent were collected by researchers for all participants in this study. Students were administered self-report measures that assessed perceived stress, grit, teacher academic support, peer academic support, and academic engagement. Teachers were administered questionnaires that included measures of teacher-reported grit and emotional engagement.

Participants

A sample of 142 third, fourth, and fifth students from a Title I elementary school serving primarily low-income, ethnic minority, dual language families in Maryland. Approximately 54% of the sample was female and the average age was 9.47 years. The sample was largely Latinx (75%) Latinx with Spanish being the most common primary language spoken in the home (63%). For additional sample demographics see Tables 1 and 2.

Only DLL students have been included in this sample (i.e., DLL was operationalized as students reporting speaking a non-English language with at least one parent/primary caregiver at home). The original sample included 149 students; however, seven students were removed for not meeting the DLL criteria. Student data on family income or immigration status could not be confirmed. However, statistics collected by the school showed that 95% of their students received free or reduced lunch (FARMS).

Teachers from each of the grade levels included in this study (third, fourth, and fifth grade) completed questionnaires on varying aspects of the student's functioning. In total, four fourth-grade teachers, four fifth-grade teachers, and one art teacher (who completed the third-

grade questionnaires) participated. The art teacher completed all third-grade questionnaires after the third-grade teachers denied participation in the study due to their demanding workload. The teachers (1 male; 4 black; 5 white) had on average 22 students per class.

Procedures

This study was approved by the University of Maryland Institutional Review Board (IRB) and the Montgomery County Public Schools IRB. A total of fifty-five percent of all third through fifth grade students in the school (n = 256) participated in the study. However, comparisons between participants and those who did not volunteer could not be conducted. The original dataset used for this study had three time points with a 97.9% retention rate. The current study will use two time points collected approximately four months apart: Time 1 (T1) and Time 2 (T2). T1 student-report data was collected between January and February 2014 while T2 student-report data was collected between May and June 2014. T1 teacher-report data was collected between March and May 2014 while T2 teacher-report data was collected between May to June 2014.

All questions were read aloud to students in a one-on-one setting to ensure all students understood the questions. Students with limited English language skills (n = 6) were interviewed by Spanish and French-speaking researchers.

Measures

Perceived stress. Perceived stress collected at T1 was assessed using a modified version of the 10-item Perceived Stress Scale (PSS - 10; Cohen & Williamson, 1988). The modified PSS - 10 contains language that is more accessible for children and references school-related contexts. Using a 5-point rating scale (1 = *Never,* 5 = *Very often*), students were asked to rate the degree to

which they view life situations as uncontrollable and overwhelming (e.g., “In the last month, how often have you felt nervous and ‘stressed’?”). Total scores for the PSS-10 were calculated using the average of the items within the scale. In a previous study, this scale demonstrated adequate internal consistency among college students (α = .89, Roberti, Harrington, & Storch, 2006), which follows DeVellis’ (2003) suggestion that alpha coefficients at a level of .65 or higher indicate adequate internal reliability. In the current study, the internal reliability for the PSS-10 is considered acceptable (α = 64). In a previous review of the psychometric properties of the PSS-10, it was found to have adequate validity.

Grit. Grit collected at T1 was assessed using a modified self-report (SR-grit) and teacher-report (TR-grit) version of the original 8-item Short Grit Scale (Grit-S; Duckworth & Quinn, 2009). The language used in the SR-grit items were modified from the original Grit-S scale for the purposes of making it more accessible for children in the school setting (e.g., “I have difficulty maintaining my focus on projects that take more than a few months to complete” became “It’s hard to focus on school work that takes a long time to complete.”). In addition, the TR-grit scale items were modified from the original Grit-S scale for the purposes of evaluating the student’s level of grit from the teacher’s perspective (e.g., It’s hard for the student to focus on schoolwork that takes a long time to complete.”). The four items from the consistency of interest subscale and the four items from the perseverance of effort subscale from the full Grit-S scale were retained in both the SR-grit and TR-grit scales. Using a 5-pt. Rating scale (1 = *Never,* 5 = *Very often*), students were asked to rate their agreement with each item on the self-report scale and teachers were asked to rate their agreement with each item on the teacher-report scale. Previous studies that have used the Grit-S have reported adequate internal consistency (O’Neal et

al., 2016) and validity (Duckworth & Quinn, 2009). In the current study, the internal reliability for both the TR-grit (α = .92) and SR-grit (α = .72) are considered adequate.

Academic support. Academic support from teachers and parents collected at T1 will be assessed with the Teacher Academic Support Scale and the Peer Academic Support Scale. Using a 5-pt. rating scale (1 = *Not at all,* 5 = *Very much*), students were asked to rate their perception of how much learning support they received from their teacher and peers. The two scales include four items each ("My teacher likes to help me learn" and "Other students in class want me to do my best schoolwork") (Johnson et al., 1985). In a previous study (Johnson et al., 1985), both the teacher academic support scale (α = .78) and the peer academic support scale (α = .67) demonstrated adequate internal consistency and validity among eighth grade students. In the current study, the internal reliability for both the peer academic support scale (α = .78) and teacher academic support scale (α = .59) are considered acceptable.

Academic engagement. Academic engagement collected at T1 and T2 will be assessed with the student-report version of the Behavioral and Emotional Engagement subscales and teacher-report version of the Emotional Engagement subscale. Using a 5-pt. rating scale (1 = *Not at all,* 5 = *Very much*), students were asked to rate their perception of how often they feel or behave in ways that indicate they are academically engaged. The two scales include five items each ("When I'm in class, I participate in class discussions," and "When we work on something in class, I feel interested."). In a previous study (Skinner et al., 2008), both the emotional engagement subscale (α = .83) and the behavioral engagement (α = .71) demonstrated adequate internal consistency and validity among a sample with elementary and middle school-aged students. In the current study, the internal reliability for the student-reported behavioral

engagement scale (α = .74), student-reported emotional engagement scale (α = .78), and teacher-reported emotional engagement scale (α = .94) are considered adequate.

Potential Covariates. Originally, only age and gender were proposed as controls in the current study, which are controls that have been used in previous studies when examining risk and resilience outcomes. Two additional controls were added to the final model. The first, students' primary language spoken at home, was added to enhance the identification of DLL students. In this sample, 81% of students reported a non-English language as the primary language spoken in the home. The remaining 19% reported English as the primary language spoken at home while speaking a non-English language with at least one parent at home. The second control added was a paired T1 academic engagement to control for previous academic engagement effects.

Analytic Approach

Missing data. To manage missing data, a restricted maximum likelihood robust standard error estimation approach (i.e., ML) was used in Mplus, which can manage both non-normal and missing data (Múthen & Múthen, 1998-2017).

Analytic Procedure. Preliminary analyses (descriptive statistics, correlations, and preliminary reliability analyses) were run on IBM SPSS Statistics Version 25. Confirmatory factor and structural path models were tested using Mplus version 8.0 (Muthén & Muthén, 2017). Descriptive statistics, including means, standard deviations, and Cronbach alpha coefficients, and omega coefficients are reported for all variables in the study (see Tables 3 and 4).

Initially, a model that incorporated latent variables was proposed; however, this would have required a larger sample size. Instead, only observed variables were used in all models. To determine if perceived stress negatively impacts academic engagement (i.e., teacher-reported

emotional engagement, student-reported emotional engagement, student-reported behavioral engagement), first CFA analyses of each of the variable were conducted. Then, individual factor scores were extracted for each scale through the CFA analyses to be used to represent each variable in the path analyses. The utilization of factor scores in place of scaled scores has been recommended to maximize the power given the sample size, especially since the stress and teacher academic support scales have low internal consistency. Then, a path analysis was completed in Mplus using T1 observed perceived stress as the predictor and the three T2 academic engagement observed variables as outcomes.

Then, a final model was created in order to determine whether grit (i.e., student- and teacher-reported grit), peer academic support, and teacher academic support moderated the relationship between perceived stress and academic engagement for DLLs, all four interactions were added to the path model, in addition to perceived stress and the main effect of each of the proposed moderators (i.e., student- and teacher-reported grit, peer academic support, teacher academic support).

Post-hoc, each model was dissected to run individual moderators, then dissected once more to run individual moderators with individual outcomes. Note that similar results were found between methods, both prior to and following the dissection of models into separate moderators and outcomes.

Two potential methods were endorsed to account for cluster effects within classrooms. The first cluster method, Fixed Effect Modeling (FEM), uses fixed effects to demonstrate the relation between a predictor and an outcome regardless of whichever cluster an observation is affiliated with (McNeish & Stapleton, 2016). This method can be beneficial for models with a small number of clusters (e.g., under 20) in comparison to multi-level modeling, design-based

correlations, or Bayesian methods (McNeish & Stapleton, 2016). In this sample, each of the 142 students included in the sample were nested into one of 12 clusters (classrooms). This approach adjusted for cluster effects by using each cluster (classroom) as a Level 1 control variable. Specifically, a cluster dummy code was created for each cluster (classroom) affiliation for each participant. All 12 cluster dummy codes were included as control variables. The second cluster method involves sampling weights which estimates parameters by maximizing a weighted loglikelihood function and uses the Hubert-White sandwich estimator to adjust standard errors for non-independence of observations (e.g., usage of "type = complex" code in Mplus; Muthén & Muthén, 2017). Both moderation methods were attempted to determine which would be most appropriate. Though FEM is often recommended with models that employ smaller clusters, the addition of dummy codes can negatively affect power. Therefore, the second method was chosen in my final analyses given the benefit of increased power.

Multiple measures of model fit were considered including the root mean square error of approximation (RMSEA) (values less than or equal to .06 indicate good fit), the standardized root mean square residual (SRMR) (values less than or equal to .08 indicate good fit), and the comparative fit index (CFI) as an incremental index (values of less than or equal to .95 indicate good fit; Little, 2013).

Chapter 4: Results

Descriptive Statistics

Table 3 shows the means, standard deviations, alpha coefficients, and ranges for all scales included in the current study: perceived stress, student-reported grit (SR-grit), and teacher-reported grit (TR-grit), teacher academic support, peer academic support, behavioral engagement, and student-reported emotional engagement (SR-emotional engagement) and teacher-reported emotional engagement (TR-emotional engagement). Omega coefficients (McDonald's ω) were used in the current study instead of Cronbach's alpha (α) as an estimate of reliability based on recent findings that McDonald's ω can provide more accurate corrections for differences in weight among items in a scale (Peters, 2014; Revelle & Zinbard, 2009; Sijtsma, 2008). Similar to Cronbach's alpha, there are currently no universally accepted guidelines for adequate levels of reliability. Instead, researchers posit that McDonald's ω should be evaluated similarly to Cronbach's α, with minimally acceptable levels of reliability at .50 and preferable scores reaching .75 (Reise, 2012; Reise, Bonifay, & Haviland, 2013; Watkins, 2017).

In this sample, mean perceived stress scores for DLL students (M = 2.49) were just below the PSS-10 mean scores for a sample of adult Asian immigrants (M = 2.55) (Haritatos, Mahalingam, & James, 2007). Reliability analyses for perceived stress at Time 1 was slightly below the preferable range, ω = .66.

Mean scores for SR-grit in this sample (M = 3.81) and TR-grit (M = 4.05) were higher than Grit-S mean scores for the scale's standardization sample (M = 3.4) for a sample of middle and high school students (Duckworth & Quinn, 2009). Reliability analyses for the modified SR-grit at Time 1 was near the preferable range, ω = .74.

Mean scores for teacher academic support (M = 4.76) and peer academic support (M = 3.66) in this sample were higher than mean scores of teacher academic support (M = 4.53) and peer academic support (M = 3.38) collected from a sample of 5th grade students across six elementary schools in Illinois (Patrick, Ryan & Kaplan, 2007). Reliability analyses for the teacher academic support scale (ω = .62) in this sample were above the minimum range whereas the coefficient for the peer academic support scale (ω = .79) was above the preferable range.

Mean scores for the behavioral engagement scale (M = 4.32) and the SR-emotional engagement scale (M = 4.12) were higher than respective mean scores among a sample of elementary and middle school aged children (Skinner et al., 2008). In this study, the TR-emotional engagement scale had a similarly higher mean (M = 4.15) as the mean score for the SR-emotional engagement in this study, yet no comparison sample exists at this time. Reliability analyses for the behavioral engagement scale at Time 2 was near the preferable range (ω = .74), whereas reliability analyses for the SR-emotional engagement (ω = .78) and TR-emotional engagement (ω = .94) scales were above the preferable range.

Correlations

Table 4 shows the correlation matrix for all variables used in this study. Overall, results from bivariate correlations between all variables in the current study were in line with what has been found in the literature. As expected, perceived stress exhibited a nearly moderate negative correlation with SR-grit (r = -.48) and smaller negative correlations with the other three moderators (r = -.15 to -.20) and three engagement outcomes (r = -.27 to -.35). Similarly, the moderators each evidenced small positive linear correlations with each other (r = .13 to .29) and the three engagement outcomes (r = 12. to .39) with the exception of the strong positive correlation between TR-grit and TR-emotional engagement (r = .77). All three academic

engagement outcomes exhibited small-to-moderate positive correlations with one another (r = .29 to .67).

The Relation between Perceived Stress and Academic Engagement

Path Analysis. T1 perceived stress was a significant negative predictor of later T2 TR-emotional engagement (Stress Estimate [SE] = -.27 (.13), p <.04, CI [-.29, -.02]) when all three academic engagement outcomes (SR-emotional engagement, TR-emotional engagement, behavioral engagement) and controls (age, gender, primary language, paired T1 academic engagement outcome) were included in the model simultaneously. Therefore, these results were partially consistent with the original hypothesis that perceived stress was negatively related to academic engagement; particularly for TR-emotional engagement (significant). Results indicated that fit statistics were adequate RMSEA = .09, CFI = .97, SRMR = .03; however, RMSEA was approaching significance.

Potential Moderators of Relation between Perceived Stress and Academic Engagement

In the final model, SR-grit, TR-grit, teacher academic support, and peer academic support were included as moderators of stress' prediction of three later academic engagement outcomes (SR-emotional engagement, TR-emotional engagement, and behavioral engagement). Controls of age, gender, primary language, and paired T1 academic engagement were included in this model. Originally, it was predicted that all four moderators would be protective factors in the relation between perceived stress and academic engagement (SR-emotional engagement, TR-emotional engagement, behavioral engagement). Specifically, it was predicted that the negative impact of stress on all three indicators of academic engagement would be mitigated for DLL

students who exhibited higher levels of SR-grit, TR-grit, teacher academic support, and peer academic support in comparison to DLL students exhibiting lower levels of these variables.

In the final model, peer academic support and SR-grit exhibited significant interactions with stress in predicting TR-emotional engagement and SR-emotional engagement, respectively (Table 5). Note that there were three academic engagement outcomes in this final model, and none of the moderators had a significant impact on stress' prediction of behavioral engagement; however, SR-grit and teacher academic support demonstrated a trend towards significance as moderators of stress' impact on behavioral engagement.

The following results below, organized by outcomes, are also within the final model which, as a reminder, includes all four moderators, all three academic engagement outcomes, and all four controls. For the outcome of T2 SR-emotional engagement, the interaction between T1 SR-grit and T1 perceived stress was a significant predictor of T2 SR-emotional engagement, after controlling for T1 SR-emotional engagement and demographics (Estimate = -0.53 (.16), p <.00, CI [-.85, -.21]; see Figure 3 for interaction). Figure 3 depicts the interaction between SR-grit and perceived stress in predicting SR-emotional engagement in the context of the final model. I had expected the high SR-grit group to have a flat line or a slightly negative slope; I predicted the low SR-grit group to exhibit a steeper negative slope in comparison to the high SR-grit group. Contrary to the original hypotheses, for the high SR-grit group, there was a negative slope which depicted lower levels of SR-emotional engagement for higher-stressed group than for lower-stressed group; the slope was not expected to be so steeply negative for high grit. For the low SR-grit group, there is a positive slope depicting SR-emotional engagement being higher for the higher-stressed group than for the lower-stressed group; low grit was not expected to have higher engagement for those who are higher stressed, compared to low stressed. Overall, this

result is contrary to the prediction of a protective effect of high SR-grit on the relation between perceived stress and later SR-emotional engagement.

For the outcome of TR-emotional engagement, results indicated, as expected, that the interaction between T1 peer academic support and T1 perceived stress was a significant predictor of T2 TR-emotional engagement, after controlling for T1 TR-emotional engagement and demographics (Estimate = 0.23 (.06), p <.00, CI [.11, .35]); see Figure 4 for interaction). Figure 4 depicts the interaction between peer academic support and perceived stress in predicting T2 TR-emotional engagement in the context of the final model. I had expected the low peer academic support group to exhibit a steeper negative slope in comparison to the high peer academic support group. As expected, for the low peer academic support group, there was a negative slope which depicted TR-emotional engagement being higher for the lower stressed individuals. For the high peer academic support group, there is a slight positive slope depicting TR-emotional engagement being higher for the higher-stressed individuals. This result is aligned with my expectation of a protective effect of high peer academic support on the relation between perceived stress and later TR-emotional engagement.

For the outcome of behavioral engagement, results indicated that none of the proposed interactions were significant predictors of T2 behavioral engagement after controlling for T1 behavioral engagement and demographics, though SR-grit (Estimate = -0.22 (.12), p =.07, CI [-.47, .02]); see Figure 5 for interaction), and teacher academic support (Estimate = .92 (.50), p =.06, CI [-.05, 1.90]); see Figure 6 for interaction), were trending toward significance as moderators (indicating a p-value below .10). As predicted, the low teacher academic support group exhibited a steeper negative slope in comparison to the high teacher academic support; however, the low SR-grit group exhibited a positive slope that was contrary to previous

predictions. As expected for the low teacher academic support group, there was a negative slope depicting behavioral engagement levels decreasing for higher-stressed students. For the high teacher academic support group, there was a positive slope depicting behavioral engagement being higher for high-stressed individuals. In contrast, for the low SR-grit group, there was a positive relationship depicting behavioral engagement being higher for the high-stressed individuals. For the high SR-grit group, there was a negative slope depicting behavioral engagement levels as higher for the low-stressed students. While results of the low teacher academic support group exhibited a steep negative slope as predicted, the steep positive slope found in the low SR-grit group did not align with my expectation of a protective effect of high SR-grit on the relation between perceived stress and later behavioral engagement.

Post-Hoc Analyses: Deconstructing the Final Model

Separate moderators. To gather additional information on how each of the moderators performed individually, the final model was deconstructed into four separate models; each with only one moderator and all three academic engagement outcomes (including all four controls). Interestingly, each of the four separate models showed the same significant interactions that were significant in the final model, with one exception. The interaction of perceived stress and teacher academic support (TAS) (with T2 student-reported emotional engagement (SR-emotional engagement)) -- which was non-significant in the final model -- became statistically significant in the separate model (Estimate [SE] = -.64 (.27), $p < .02$, CI [-1.20, -.11].

Separate moderators and separate outcomes. The four separate models were further deconstructed into twelve models; each model included one moderator with one outcome. Similar results were found when the final model was deconstructed into twelve models (one

moderator, one outcome) as when it was deconstructed into four models (one moderator, three outcomes).

Post-hoc analyses that included the deconstruction of the final model into separate moderators and then further into separate outcomes was completed to assess how each moderator functioned independently within the model. While a new significant interaction between perceived stress and teacher academic support (with T2 student-reported emotional engagement) was found in the post-hoc analyses, these significant results should be interpreted with caution. First, it is important to note that a limitation of a high number of post-hoc analyses is the increased likelihood of a Type I error (Holmbeck, 2002). Second, recent research suggests that the use of multiple-moderator models (2+ moderators in a model) may prevent issues of confounding of interactions effects (Montoya, 2019). In essence, multiple-moderator models provide a clearer picture of how each of the moderators interact with one another in addition to the predictor and its relation to the outcome (Montoya, 2019). Therefore, the final model with all four moderators, all three outcomes, and all four controls included is believed to provide the clearest picture of the relationships between the variables in this study.

Chapter 5: Discussion

Given that Latinx and immigrant DLL students are likely to face higher rates of stress and report different types of stressors in comparison to their peers (Alegria et al., 2017; Isasi, Rastogi, & Molina, 2016; Levy et al., 2016), increased understanding of how stress is perceived by this population and how it affects their academic functioning is warranted. First, there is limited research on general measures of stress, such as perceived stress, for school aged and Latinx, immigrant DLL populations. Second, while the negative relationship between stress and academic achievement has been well documented among adults, there is little research on the effects of perceived stress on academic engagement among children and youth.

The goal of the current study was to evaluate the longitudinal effects of perceived stress on later academic engagement for a sample of low-income, mostly Latinx immigrant DLLs, and which personal and environmental factors may protect them from the negative impact of stress on academic engagement. Specifically, this study explored if student-reported grit, teacher-reported grit, teacher academic support, and peer academic support were potential protective factors in the relation between perceived stress and academic engagement (i.e., student-reported emotional engagement, teacher-reported emotional engagement, and behavioral engagement). This study found that perceived stress did, indeed, have a negative impact on later academic engagement, and that peer academic support and student-reported grit served as moderators; however, student-reported grit's moderation pattern indicated protective factors for only low-stressed DLL students. This study holds important implications for future researchers and practitioners in examining how stress perceived by young Latinx and DLL students can negatively affect their academic engagement and which personal and environmental protective factors can mitigate that relationship. The following discussion will further explore the results of

the current study and tie them to the existing literature. First, the theoretical framework will be revisited in the context of the final model. Then, the relationship between perceived stress and academic engagement will be explored, followed by an examination of the moderators. Implications, limitations, and suggestions for future research will also be discussed throughout.

Theoretical Framework

Results from the current study are in alignment with previous literature and theory on the negative effects of stress on children's functioning. Lazarus and Folkman's (1984) transactional model of stress acknowledges that an individual's perception of stress is determined by their own stress response. While low-income, Latinx, immigrant DLL students face a number of tangible barriers to accessing education and enhancing their academic achievement (e.g., discrimination, less educational opportunity), each student may perceive these barriers or events as being more or less stressful than another student. Therefore, understanding DLL students' levels of perceived stress as opposed to tallying discrete stressful events or specific types of stressors (e.g., discrimination stress) may allow for a more nuanced measurement of stress and its effects. In addition, Lazarus and Folkman's (1984) model describe stress as being a relationship between a person and their environment. Similarly, while Masten's (2004) risk and resilience model does not only focus on stress, stress can pose as a risk factor (Masten, 2001). Masten's model (2001, 2004) is often couched within the context of academic risk and resilience, particularly for vulnerable student populations (e.g., ethnic minority, low-income) (Rivera & Waxman, 2011). For low-income, immigrant, Latinx students, there are multiple risk factors that contribute to lower academic functioning (e.g., low-income, DLL status) (Perez et al., 2009). As hypothesized, the risk factor of perceived stress, reported by DLL students, predicted lower levels of later

teacher-rated emotional engagement and self-reported behavioral engagement in school, in this study.

At the core of this combined theoretical framework is the presence of potential moderators that may mitigate the negative effects of stress. In particular, personal and environmental factors are thought to be prime mitigators of stress. As stated by Lazarus & Folkman, (1984) stress is considered a 'transactional' relationship between an individual and their environment. Based on a developmental perspective, Masten's risk and resilience model (1988, 1994) considers multilevel factors that can influence the negative effects of stress on a child's functioning. Simultaneous examination of multilevel protective factors is important for enhanced understanding of a child's developmental context. For DLL students, personal (e.g., resilience) and environmental factors (e.g., social support) are commonly cited as buffering of negative risk factors (e.g., Perez et al., 2009). In this study, these factors encompass both personal attributes of a child (grit) in addition to environmental factors in the school setting (academic support from teachers and peers) that can influence their academic engagement. As expected, results from the current study indicated that both personal (i.e., SR-grit) and environmental (i.e., peer academic support) factors functioned as moderators with differing patterns of protective effects.

The remaining portion of this discussion section will explore these results and revisit the literature. First, the current study's findings on the relationship between perceived stress and later academic engagement will be discussed. Then the inclusion of the moderators (SR-grit, TR-grit, teacher academic support, PAS), and post-hoc analyses will be addressed. Lastly, implications for these findings, limitations of the current study, and suggestions for future research are discussed.

Relationship between Perceived Stress and Academic Engagement

Originally, it was hypothesized that perceived stress would have a negative linear relationship with all three indicators of academic engagement used in this study. This prediction was based on a wealth of literature that has documented the detrimental effects of stress on academic functioning, including the separate construct of academic engagement, for students of all backgrounds (Akgun & Ciarrochi, 2003; Alva and de Los Reyes, 1999; Gillock & Reyes, 1999; Kaplan et al., 2005). In particular, Latinx and immigrant DLL students are especially likely to face high levels of stress (Alegria et al., 2017; Isasi et al., 2016) in addition to unique and varied types of stressors (e.g., discrimination stress, language anxiety) that can negatively affect their academic functioning (Levy et al., 2016), and contribute to the achievement gap between DLL students and their non-DLL peers. The hypothesis that stress would have a negative effect on later academic engagement was largely supported in this study -- perceived stress exhibited a significant negative relationship with later teacher-reported emotional engagement and a non-significant negative relationship with self-reported behavioral engagement (behavioral engagement). In other words, DLL students who reported higher levels of stress tended to have lower levels of later teacher-reported emotional engagement. While few studies have explored the negative effects of perceived stress on academic engagement (Raufelder et al., 2014; Serrano & Andreu, 2016; Thomas & Borrayo, 2012), the current study is, at this time, the first to demonstrate the negative relationship between perceived stress and academic engagement for Latinx, immigrant DLL students.

Moderators of Perceived Stress and Academic Engagement

Originally, I predicted that all four moderators (student-reported grit, teacher-reported grit, teacher academic support, peer academic support) would serve as protective factors in the

relationship between perceived stress and all three academic engagement outcomes (student-reported emotional engagement, teacher-reported emotional engagement, behavioral engagement). In particular, I predicted that the negative effects of perceived stress on all three indicators of academic engagement would be weaker for students who exhibited higher levels of all four moderators in comparison to students who exhibited lower levels of these moderators. This hypothesis was partially supported -- in the final model which included all four moderators and all three outcomes, the interactions between perceived stress and student-reported grit (with outcome of T2 student-reported emotional engagement) and the interaction between perceived stress and peer academic support (with outcome of T2 teacher-reported emotional engagement) were significant (Table 5). The nature of how these variables act as moderators is explained in more detail below.

Peer academic support. In the final model, the interaction between perceived stress and peer academic support appeared to show a protective effect (see Table 5 and Figure 4). As predicted, the low peer academic support group (with outcome of T2 teacher-reported emotional engagement) exhibited a steeper negative slope in comparison to the high peer academic support group. At high levels of perceived stress, the low peer academic support group was more likely to show lower levels of teacher-reported emotional engagement than those in the high peer academic support group. In comparison, those in the high peer academic support group showed similar levels of teacher-reported emotional engagement regardless of stress level. Therefore, the negative effects of stress on the academic engagement of DLL students may be mitigated by high levels of peer academic support. This finding is related to previous research that peer academic support is negatively associated with forms of stress for English-as-a Foreign Language (EFL) learners (Ghaith, 2002) and positively associated with enhanced academic engagement for

culturally and linguistically diverse children (Alfaro et al., 2006; Fuligni, 1997; Gonzalez & Padilla, 1997; Plunkett et al., 2008). The current study is the first to evaluate peer academic support as a moderator of any effect, much less as a moderator of the negative impact of stress on later academic engagement.

Student-reported grit. In the final model, while the interaction between perceived stress and student-reported grit (with outcome of T2 student-reported emotional engagement) was also significant, the moderation pattern was the opposite of what was expected and was noticeably more challenging to decipher (see Table 5 and Figure 3). Contrary to my original hypothesis, the low student-reported grit group demonstrated a positive slope in comparison to the high student-reported grit group. This means that DLL students in the low student-reported grit group were more likely to show higher student-reported emotional engagement at high levels of perceived stress compared to the high grit group. This interaction demonstrates that student-reported grit is functioning partially as a protective factor in the relationship between perceived stress and later student-reported emotional engagement in this DLL sample. Student-reported grit appears to be a partial protective factor since it only has protective effects for DLL students who report low levels of perceived stress. At low levels of perceived stress, DLL students in the high student-reported grit group have higher levels of student-reported emotional engagement than those in the low student-reported grit group. Although I expected high student-reported grit to protect those at high stress levels, the finding that student-reported grit may only function as a protective factor for DLL students who report lower levels of stress partially aligns with my original hypothesis of student-reported grit's potential protective effects. Previous research has demonstrated grit's positive associations with academic functioning for minority students (Eskreis-Winkler et al., 2014, Piña-Watson et al., 2014, Strayhorn, 2014). Though few studies

have examined the associations between perceived stress and grit, some have found that they are negatively associated (Lee, 2017; O'Neal, 2017; Wong et al., 2018). Most relevant, Lee (2017) hypothesized that grit operates as a psychological resource that can help students become less prone to stress; however, this study's results contradicted Lee's suggestion. Based on the current results, it is possible that student-reported grit's effectiveness as a psychological resource is dependent on the level of stress reported by students. In essence, higher levels of student-reported grit may only mitigate the relationship between perceived stress and academic engagement for students who report lower levels of stress in comparison to students who report higher levels of stress. As discussed more below, based on these findings, it will first be necessary to help DLL students with stress management prior to considering a grit-promoting intervention.

Limitations

The major limitations found within this study were the short-term longitudinal design, the low sample size, the use of a broad measure of stress (PSS), the use of observed variables and adapted measures, and the inclusion of a different rater (art teacher) for 3rd graders in this sample. The largest limitation was the lower sample size ($N = 142$) which may have affected power and decreased the ability to account for variation across DLLs. The sample size was too small to use latent instead of observed variables. Therefore, factor scores were used as a compromise instead of latent or summary scores. It is also important to note the use of adapted measures (perceived stress, student-reported and teacher-reported grit, and teacher-reported emotional engagement) in this study. While these adaptations were completed to increase accessibility and relatedness for the current sample (DLL school-aged children), the adaptations may have affected reliability, like the perceived stress measure, which was low in reliability in

the current study. In addition, the use of a general measure of perceived stress may be confounded with personality. Previous research has found that the personality trait of neuroticism and stress are often associated (Gramstad, Gjedsted & Haver, 2013), so if one is more neurotic, one may perceive higher stress levels. Further, while the use of a general measure of stress is a strength of the study and highlights its contribution to the DLL stress literature, it is important to note that the use of a broad measure of stress does not allow for investigation of specific stressors unique to multi-marginalized populations. Lastly, the use of art teachers as teacher raters for 3rd grade students within the sample may have affected teacher-reported variables.

Future studies may look to build upon this study by including additional control factors (e.g., SES, personality) and examining additional sources of academic support (e.g., parents, other school personnel) for DLL students which has been done in a few other studies with Latinx immigrant youth (e.g., DeGarmo & Martinez, 2006; Garcia-Reid et al., 2015; Gillock & Reyes, 1999; Perez et al., 2009). Further, investigation into mediators in the relationship between stress and academic engagement for DLL students would be an alternative model that warrants future research. In addition, recruiting representative samples of different ethnic groups would better account for growing superdiversity of DLL students. Finally, given the limited protective effects of student-reported grit found in the current study, future analyses should explore the potential of grit's subfactors (consistency of interest and perseverance of effort) as separate moderators. Perhaps, one of grit's subfactors will be a stronger moderator than the full grit scale.

Implications

DLL students. While a number of studies have examined the unique effects of different types of stress on DLLs, this study is, at this time, the first to use a broader stress measure,

particularly perceived stress, to evaluate the effects of perceived stress on later academic engagement for this demographic. For DLLs, the use of a general perceived stress measure may capture a wider range of stressful experiences that these populations encounter in comparison to a measure of a particular stressor.

This study is, at this time, the first to demonstrate the protective effects of peer academic support in the relationship between perceived stress and later academic engagement. These findings build upon Garza's (2009) study that found Latino students may value academic support more than social support from teachers; however, further research in this area is warranted. Based on the final model, peer academic support demonstrated protective effects in the relationship between perceived stress and teacher-reported emotional engagement whereas the moderating effect of teacher academic support was non-significant. One reason that peer academic support emerged as a significant predictor instead of teacher academic support may be that peers may serve as a surrogate source of support for students who come from single-parent families or who feel that supports at school do not meet their needs (Plunkett et al., 2008). In line with this hypothesis, a study on peer effects on academic achievement for school children by Hoxby (2002) showed that a higher percentage of Hispanic students in a classroom had a positive effect on Hispanic students' academic achievement. Hoxby (2002) posits that higher numbers of Hispanic peers in the classroom may be helpful for each student because they are more likely to find another student who has difficulty with English. In other words, an increase of DLL students in a classroom may make it more likely that they will find other DLL students who can serve as 'cultural brokers' to the language of the classroom or the academic material itself.

Implications for schools. Schools must be aware of the many stressors DLL students can face inside and outside of the school setting and take action to minimize its effects on students' wellbeing. In previous studies, immigrant DLL students have self-reported facing language anxiety (Hashemi, 2011), bicultural stress (Piña-Watson et al., 2014) cultural identity confusion (Meca et al., 2017), acculturation stress (Mikolajczyk et al., 2007), past trauma from immigration process (Sibley & Brabeck, 2017), discrimination stress (Foxen, 2010), and fear of deportation of family members (Aganza, Gamboa, Medina, & Vuelvas, 2019) which can lead to lower achievement outcomes. The current study contributes to the current literature base on the impact of stress for DLL students as it is the first to show that perceived stress can negatively impact later emotional and behavioral academic engagement of DLL students. Since previous studies that utilized measures of perceived stress with elementary-aged children are limited, the implications for comparing the magnitude of stress levels for DLL students to non-DLL peers are also limited. Yet, when coupled with previous findings that Latinx and immigrant students are likely to face high levels of stress (Isasi et al., 2016; Potochnick, 2010) and unique stressors (Hashemi, 2011; Mikolajczyk et al., 2007), the current results still contribute to the push for U.S. public schools to better understand the magnitude to which DLL students may perceive their life as stressful.

A focus on DLL stress by schools can inform preventative efforts to alleviate that stress and close the achievement gap. The stress levels of this sample had a wide range and were on average about the same levels as a study completed with Asian immigrant adults (Haritatos, et al., 2007). It is difficult to interpret the stress levels of this sample as high or low, in comparison to adult samples that often have different numbers of stress items or different summary scores than our study. In addition, based on previous findings that an individual's perception of stress'

consequences on their wellbeing can influence its effects on their functioning, additional research is needed for increased understanding on the consequences of stress perceptions (Keller et al., 2012). Overall, for the sample in the current study, it seems that stress has a negative relationship with academic engagement. Trauma-informed care seems potentially relevant for the full range of stress faced by low-income, DLL students. In recent years, a push toward trauma-informed care and practices within the school setting, the environment where children are most likely to receive mental health services, has led to the development of trauma-informed schools. Trauma-informed schools adopt an organizational structure that recognizes the impact of trauma along with its signs and symptoms, fully integrates trauma-informed approaches in their policies, procedures, and practices, and actively avoids retraumatizing students through multi-tiered systems of support (MTSS) practices (e.g., Cavanaugh, 2016). Key components of trauma-informed schools include the creation of a safe environment that avoids retraumatizing students, high rates of positive interactions between teachers and students, culturally responsive practices, peer supports, and targeted supports (e.g., Cavanaugh, 2016). The current study adds to the stress literature on DLL students by utilizing a measure of general stress perceived by this sample, which can further inform school-based practices such as the adoption of trauma-informed care.

In addition to highlighting the impact of stress, this study also adds to the literature base on important mitigators of stress for DLL students. Similar to the current study's findings on peer academic support, student-reported grit's role as a protective factor in the relationship between perceived stress and student-reported emotional engagement is the first in stress-academic engagement research. In the final model, though the interaction between perceived stress and student-reported grit was a significant predictor, the resulting interaction partially supported the original hypothesis of grit's potential as a protective factor. According to these

results, student-reported grit only appeared to serve as a protective factor for DLL students who also reported lower levels of stress. For high-stressed students, students in the low student-reported grit group were more likely to show higher student-reported emotional engagement compared to the high-grit group. There are a number of potential explanations for these findings which highlights the importance of exploring the implications of these high stress, low grit moderation findings with caution. Perhaps, the meaning of grit differs for those under high stress. It is worth exploring, in the future, this group of highly stressed DLL students, and their characteristics which may be related to grit, along with how grit functions uniquely for them. In addition, it's possible that grit's potential as a resource for combating the negative effects of stress may only be activated in the presence of lower levels of stress for DLL students. This finding may have limited, but potential implications for grit research and real-life application of grit theory in the form of grit interventions for low-income, ethnic minority students. While some U.S. schools have recently adopted school-wide grit interventions (Tough, 2011; Zernike, 2016), there is little research on the efficacy of these interventions for culturally and linguistically diverse children (O'Neal et al., 2019). The current study's findings that higher levels of grit among DLL students may only be protective for those who report lower levels of stress may inform future grit interventions. It may be beneficial that DLL students' levels of stress are addressed and interventions to alleviate higher levels of stress are implemented prior to grit interventions. Further research is necessary to evaluate the construct of grit and its protective and predictive power for these populations (O'Neal et al., 2019), particularly in the context of stress.

Implications for school psychologists. School psychologists are uniquely qualified professionals in the school setting who can provide direct and indirect services to DLL students to enhance their social, emotional, and academic wellbeing (Robinson-Zañartu, Rodríguez, &

Olvera, 2019), and they can provide change at the school systemic level (e.g., MTSS) along with advocacy. Based on evidence from the current study and previous research of the impact of stress, school psychologists should consider using their varied roles in the school environment to help mitigate stress' negative effects on students' academic engagement through direct and indirect methods focused on prevention and treatment of stress for students. For example, school psychologists can directly provide counseling services in the school setting for students who are may demonstrate lower levels of academic engagement (e.g., skipping classes, failing classes) and are at-risk for high levels of stress.

Indirect methods of service delivery may include sharing academic-related community resources (e.g., tutoring services, academic mentoring programs) with families of students who may be experiencing high stress and decreased academic engagement. In addition, school psychologists can indirectly address school-related stressors for DLL students (e.g., discrimination stress, academic stress, bicultural stress, language anxiety) through organizing professional development programs or engaging in targeted teacher consultation and advocacy. For example, in response to the recent increase of DLL students enrolled in public schools in California, researchers have developed an Asset-Based Consultation model that combines instructional consultation and culture-specific tools (i.e., Cultural Assets Identifier) within a multicultural, response-to-intervention framework to address the academic, social, and emotional needs of new DLL students (Barba, Newcombe, Ruiz, & Cordero, 2019). An important feature of this model is the shift toward cultural asset-based practices that help shift the biases consultees may have that stem from deficit-based theories and practices inherent within the U.S. educational system that are prejudiced toward culturally and linguistically diverse students (Barba et al., 2019). Through their integration within all levels of systems-based practices, school

psychologists are uniquely qualified to support their DLL students' academic engagement through advocating for school-based practices focused on prevention of stressors for this population and engaging in targeted, evidence-based interventions.

Based on peer academic support's role as a protective factor, school psychologists may consider helping students to build skills to promote academic support in their peer relationships. Similar to building emotional awareness and support between students through use of social emotional programs (Weissberg & O'Brien, 2004), school psychologists can explore ways to build academic support between students to mitigate the effects of stress on academic engagement. This may include building on pre-existing evidence-based practices that utilize peer relationships to build on academic achievement and engagement, such as cooperative learning, peer mentoring, and peer tutors (Cavanaugh, 2016; Ghaith, 2002; Johnson et al., 1985). Potential avenues for specifically bolstering peer academic support may include teaching appropriate language for sharing academic grades amongst peers (e.g., avoid 'grade shaming'), how to provide ethical and constructive support for a peer who may be struggling in a class (e.g., avoid allowing peer to copy your homework), and encouraging healthy dialogues between peers around academic excellence and achievement. As mentioned above, given that peers may serve as important surrogate systems of support for students who find other sources of support (e.g., teachers, family) to be inadequate or serve as 'cultural brokers' for other students who struggle with academic material, programs that target strengthening peer relationships within an academic context may be particularly useful for DLL students. While some studies have identified which acts of teacher academic support Latinx students find most helpful (e.g., Garza, 2009), additional research should investigate the utility of peer academic support for DLL students.

Conclusion

Academic engagement has emerged as an important indicator of academic functioning for DLL students, a group who is uniquely impacted by the achievement gap (Callahan, 2013; Sugarman, 2019). Research has identified a variety of unique stressors (e.g., acculturation stress, discrimination stress, language anxiety) (Albeg & Castro-Olivo, 2014; Alegria et al., 2017; Hashemi, 2011; Isasi, et al., 2016; Roche & Kuperminc, 2012) that can serve as barriers to DLL's academic engagement, yet no studies exist that explore the effects of a general measurement of perceived stress on academic engagement for this population. In addition, while previous studies have identified personal and environmental factors that can support DLL students' academic engagement, at the time of the current paper, there are no studies that have examined potential moderators in the relationship between stress and academic engagement for DLL students.

To address this gap in the literature, the current study investigated if DLL students' perceived stress negatively affected their academic engagement and if student-reported grit, teacher-reported grit, peer academic support, and teacher academic support served as protective factors in this relationship. Results demonstrated that perceived stress did in fact have a negative impact on academic engagement for DLL students. In addition, peer academic support and, for low-stressed DLL students, student-reported grit, served as protective factors in the relationship between perceived stress and academic engagement. With acknowledgement of the limitations described above, the results of this study contribute to how perceived stress affects academic engagement for DLL students. These results are in line with previous studies that have documented the negative impact of stress on a variety of academic outcomes for Latinx, low-income, immigrant DLL students (Benner & Graham, 2011; Foxen, 2010; Hashemi, 2011) and

the importance of personal and environmental factors that can mitigate these effects. Consequently, this study sheds a new perspective with evidence that grit, particularly for low-stressed DLL students, and peer academic support, for all levels of stress, can serve as protective factors in the relationship between perceived stress and academic engagement.

These results hold implications for how schools and school psychologists can mitigate DLL students' stress and support their academic engagement in the academic environment. In particular, schools should address stress levels of DLL students and implement systems-level practices that are informed by trauma research and prioritize a safe and warm environment to avoid retraumatization (e.g., trauma-informed schools). In addition, while schoolwide grit interventions have increased in popularity in recent years, results from this study indicate that these interventions may only be effective for DLL students with lower levels of stress; therefore, more research is needed to address the efficacy of grit interventions for culturally and linguistically diverse students. School psychologists can further support DLL students at all levels of MTSS, such as helping to implement school-wide practices that aim to minimize stress for vulnerable students, targeted consultation with teachers who are struggling to support DLL students in the classroom (e.g., Asset-Based Consultation; Barba et al., 2019) and engaging in one-on-one counseling with students who require intensive interventions. Given that academic support emerged as the strongest protective factor in this study, school psychologists may consider engaging in practices that build academic support between DLL peers to mitigate the negative effects of stress on academic engagement for this population.

Appendix A

Table 1

Sample Demographics: Gender, Age, Grade Level, Ethnicity

	Total Sample	
Demographic Variables	*N*	%
Total	142	100
Child Gender		
Male	65	46
Female	77	54
Age		
8 years	24	17
9 years	51	36
10 years	42	30
11 years	24	17
12 years	1	<1
Grade Level		
3rd	49	35
4th	43	30
5th	50	35
Ethnicity		
Asian/Pacific Islander	12	9
Black, non-Hispanic	20	14
Latina/o	106	75
White	4	3

Table 2

Sample Demographics: Primary Home Language

	Total Sample	
Demographic Variables	*N*	%
Total	142	100
Spanish	89	63
English	27	19
French	4	3
Creole	4	3
Vietnamese	2	1
Arabic	2	1
“Away”	2	1
Awe	1	<1
Bengali	1	1
Cambodia	1	<1
Haitian	1	<1
Harak	1	<1
Mandarin	1	<1
Mandigo	1	<1
Pidgin	1	<1
Twi	1	<1
Not reported	1	<1

Note: Total n = 142

Table 3

Descriptive Statistics of Variables of Interest

Measures	Number of Items	*M (SD)*	α	ω	Range
T1 Perceived Stress	10	2.49(.58)	.64	.66	1.00 – 5.00
T1 SR Grit	8	3.81(.68)	**.72**	.74	1.00 – 5.00
Consistency of Interests subscale	4	3.57(.85)	.58	.60	1.00 – 5.00
Perseverance of Effort subscale	4	4.05(.80)	**.74**	.75	1.00 – 5.00
T1 TR Grit	8	4.05(.86)	**.92**	.93	1.00 – 5.00
Consistency of Interests subscale	4	3.99(.88)	**.81**	.82	1.00 – 5.00
Perseverance of Effort subscale	4	4.12(.95)	**.93**	.93	1.00 – 5.00
T1 Teacher Academic Support	4	4.76(.38)	.59	.62	1.00 – 5.00
T1 Peer Academic Support	4	3.66(.99)	**.78**	.79	1.00 – 5.00
T1 SR Behavioral Engagement	4	4.28(.64)	**.69**	.73	1.00 – 5.00
T1 SR Emotional Engagement	4	4.32(.65)	**.73**	.74	1.00 – 5.00
T1 TR Emotional Engagement	4	4.11(.88)	**.94**	.94	1.00 – 5.00
T2 SR Behavioral Engagement	5	4.32(.58)	**.74**	.78	1.00 – 5.00
T2 SR Emotional Engagement	5	4.12(.71)	**.78**	.79	1.00 – 5.00
T2 TR Emotional Engagement	5	4.15(.82)	**.94**	.94	1.00 – 5.00

Note. Alpha coefficients in bold meet an acceptable internal reliability level of .65 or higher (DeVellis, 2003).

Table 4

Correlation Matrix of Variables of Interest

Measure	1	2	3	4	5	6	7	8	9	10	11	12
1. Perceived Stress	--	-.48**	-.40**	-40*	-.20	-.15	-.22*	-.16	-.15	-.27**	-.35**	-.28**
2. SR Grit		--	.84**	.82**	.29**	.23**	.32**	.14	.13	.38**	.34**	.29**
3. SR Grit CI			--	.37**	.21**	.15	.23**	.03	.09	.21*	.22**	.26**
4. SR Grit PE				--	.28**	.24**	.29**	.22**	.13	.43**	.35**	.21*
5. TR Grit					--	.94**	.95**	.12	.29**	.33**	.28**	.77**
6. TR Grit CI						--	.78**	.11	.27**	.29**	.27**	.62**
7. TR Grit PE							--	.11	.28**	.33**	.27**	.83**
8. Teacher Academic Support								--	.41*	.39**	.29**	.12
9. Peer Academic Support									--	.29**	.23**	.23**
10. Behavioral Engagement										--	.67**	.36**
11. SR Emotional Engagement											--	.29**
12. TR Emotional Engagement												--

Note. SR means student-report and TR means teacher-report. ** = significant at the 0.01 level and * = significant at the 0.05 level.

Table 5

Unstandardized and Standardized Estimates for Final Model

	Student-reported Engagement			***Teacher-reported Engagement***			***Behavioral Engagement***		
Parameter Estimate	***Unstandardized***	***Standardized***	***p-value***	***Unstandardized***	***Standardized***	***p-value***	***Unstandardized***	***Standardized***	***p-value***
Perceived Stress	.13(.12)	.10(.09)	*n.s.*	-.19(.07)	-.12(.04)	**.01**	.08 (.06)	.09(.08)	*n.s.*
SR-grit	.15(.11)	.15(.11)	*n.s.*	-.04(.04)	-.03(.03)	*n.s.*	.13(.06)	.20(.09)	**.03**
TR-grit	.01(.08)	.01(.11)	*n.s.*	.53(.06)	.60(.07)	**.00**	.07(.05)	.16(.10)	*n.s.*
Teacher Academic Support	.33(.15)	.10(05)	**.03**	-.16(.21)	-.04(.05)	*n.s.*	.28(.20)	.13(.10)	*n.s.*
Peer Academic Support	.00(.06)	.00(.07)	*n.s.*	.04(.06)	.03(.05)	*n.s.*	.02(.05)	.03(.10)	*n.s.*
PSS x SR-grit	-.53(.16)	-.22(.06)	**.00**	-.16(.16)	-.05(.05)	*n.s.*	-.22(.12)	-.14(.09)	*n.s.*
PSS x TR-grit	-.07(.05)	-.04(.03)	*n.s.*	.07(.06)	.03(.02)	*n.s.*	.03(.08)	.02(.06)	*n.s.*
PSS x Teacher Academic Support	-.11(.26)	-.01(.03)	*n.s.*	-26(.54)	-.02(.05)	*n.s.*	.92(.50)	.17(.09)	*n.s.*
PSS x Peer Academic Support	.00(.16)	.00(.01)	*n.s.*	.23(.06)	.09(.03)	**.00**	-.15(.14)	-.11(.11)	*n.s.*

Note. Boldfaced p-values are statistically significant (p = < .05). P-values are based on unstandardized estimates.

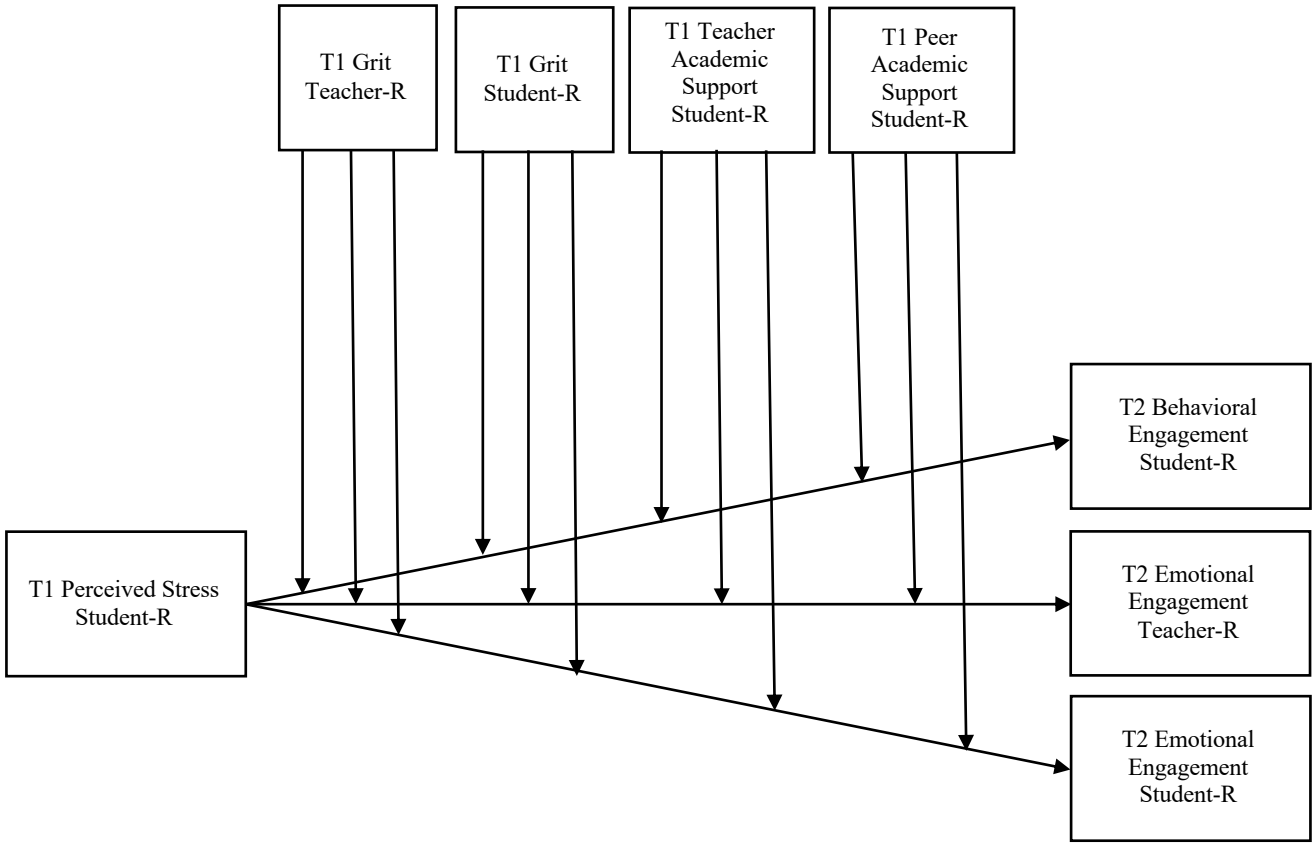

Figure 1. Proposed theoretical moderation model.

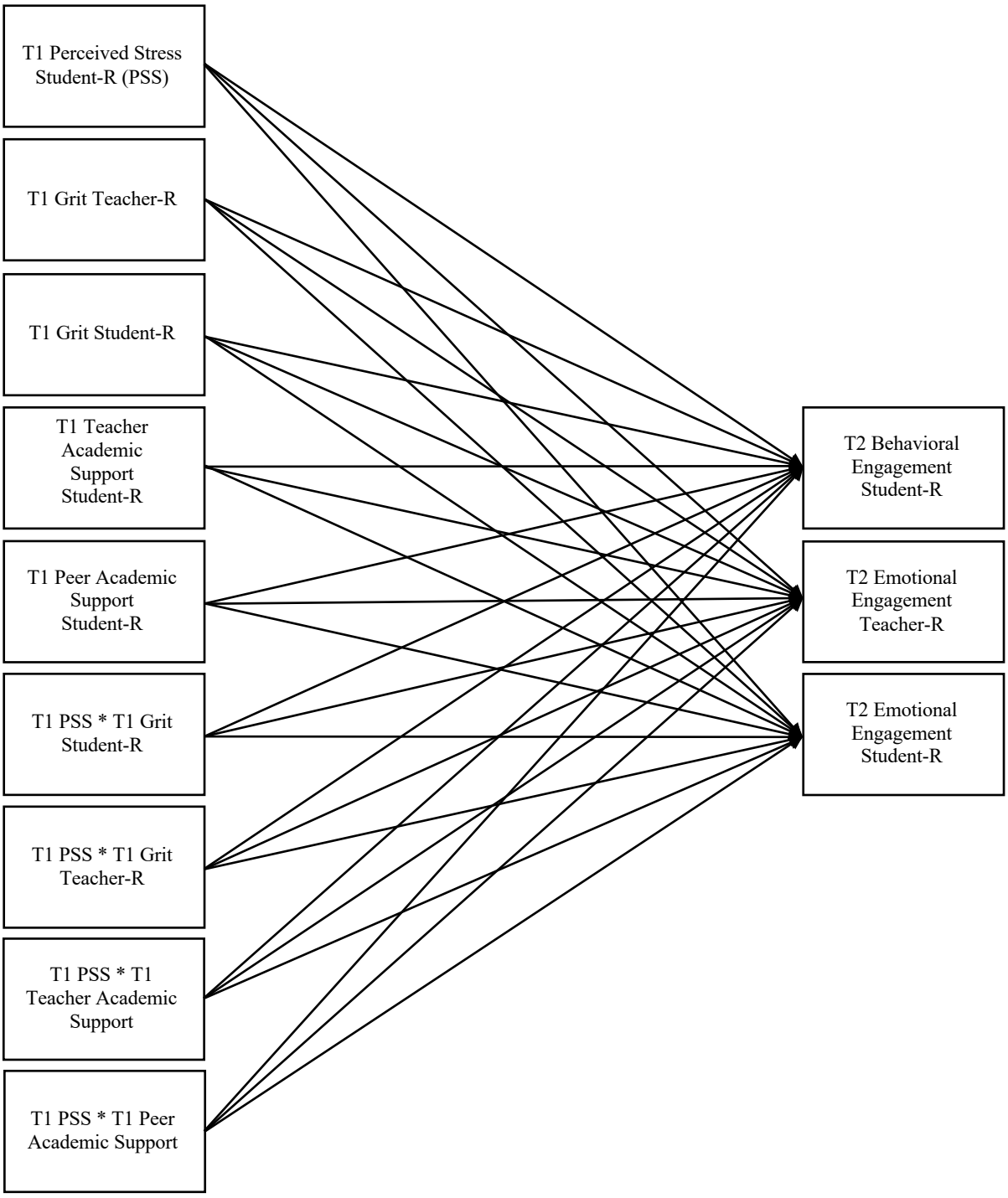

Figure 2. Proposed measurement moderation model. Note that controls (age, gender, primary language, paired T1 academic engagement) are not depicted.

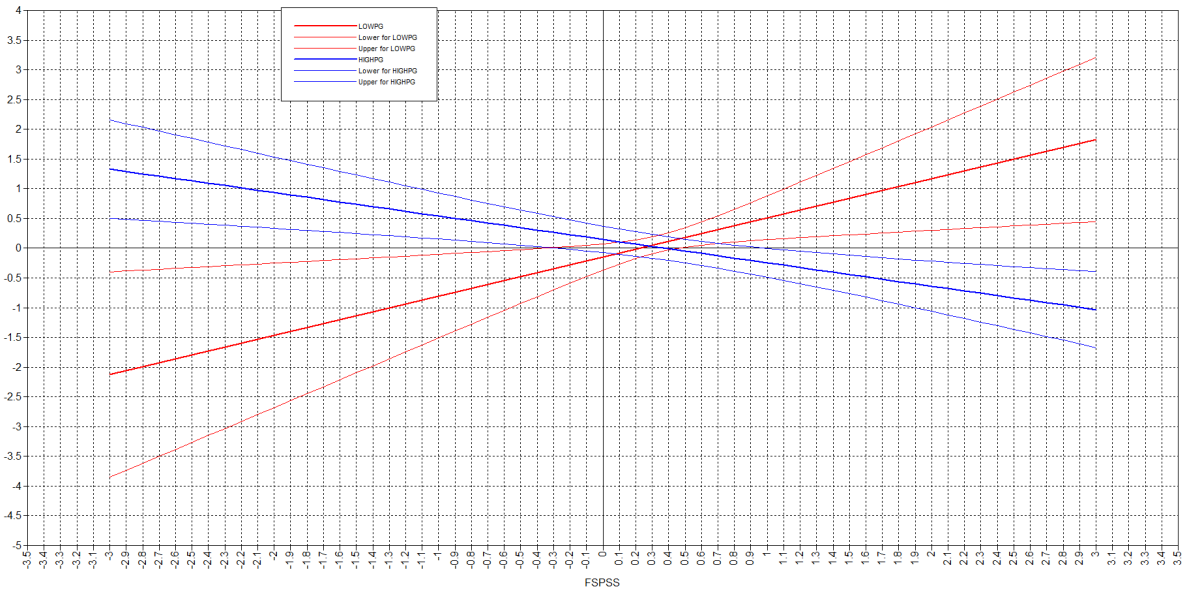

Figure 3. Plot demonstrating significant interaction of perceived stress and student-reported grit (SR-grit) with the outcome of student-reported emotional engagement (SR-emotional engagement) in the final model.

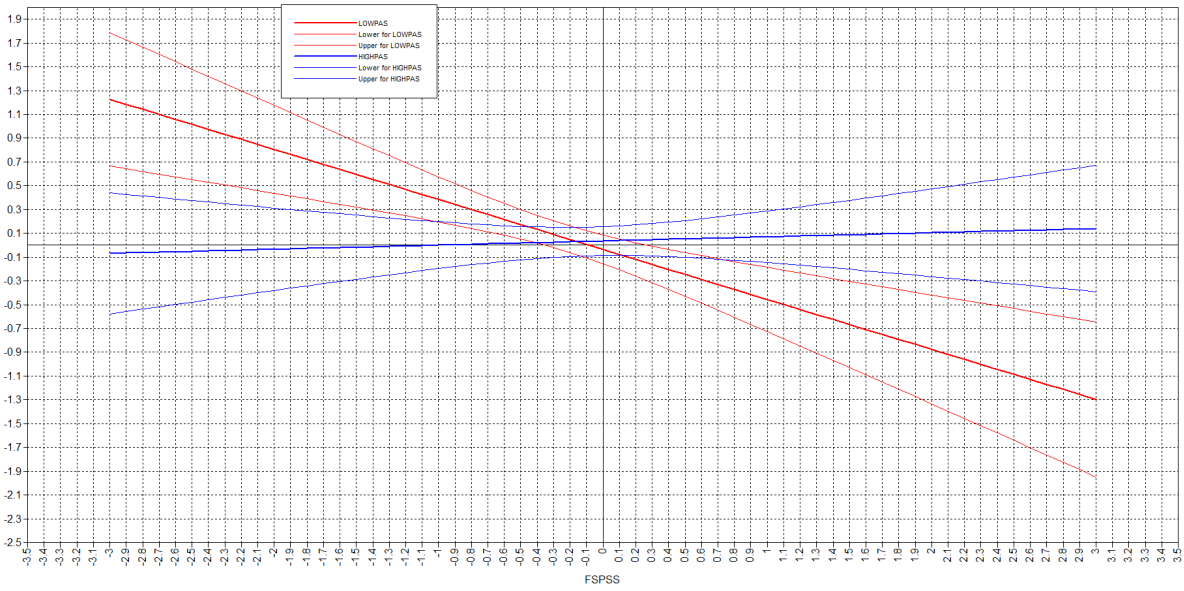

Figure 4. Plot demonstrating significant interaction of perceived stress and peer academic support (PAS) with the outcome of teacher-reported emotional engagement (TR-emotional engagement) in the final model.

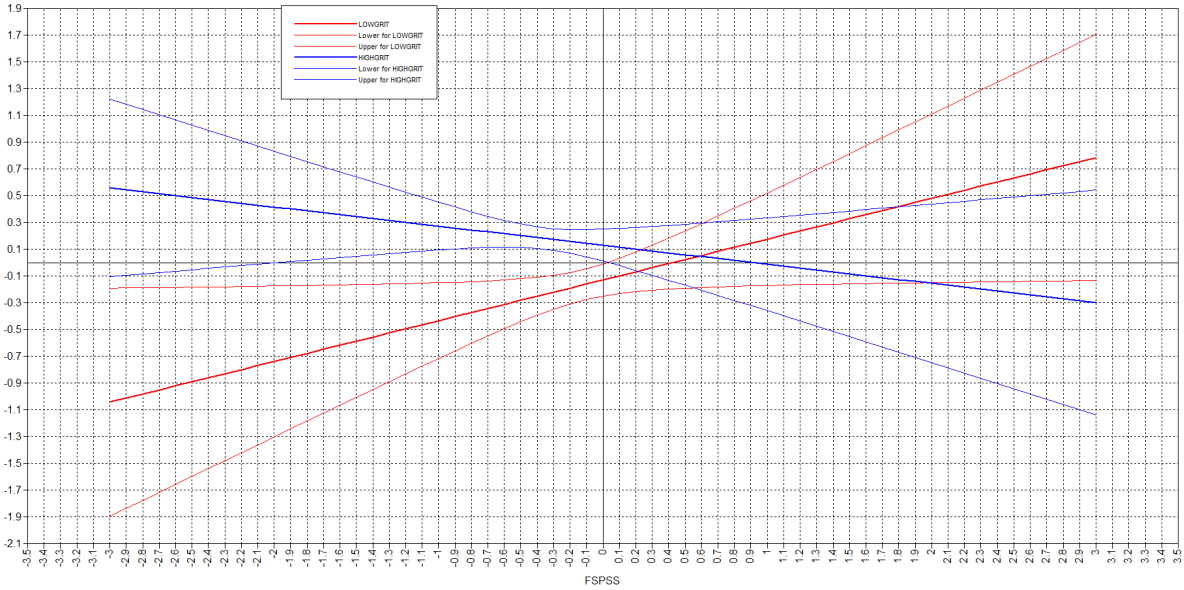

Figure 5. Plot demonstrating trending interaction of perceived stress and student-reported grit (SR-grit) with the outcome of behavioral engagement in the final model.

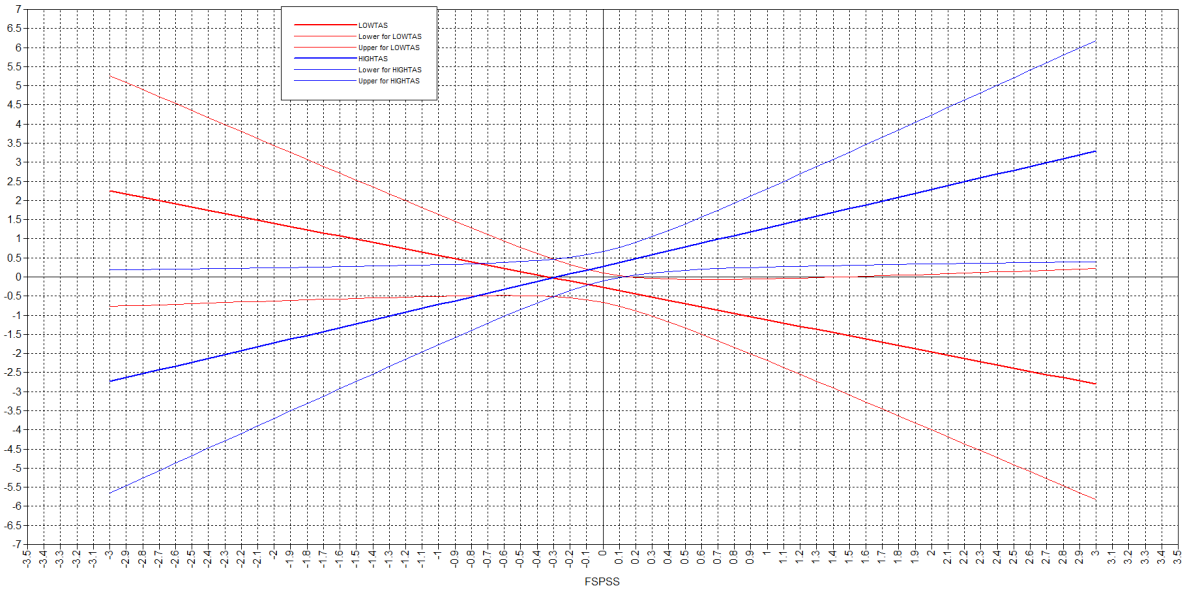

Figure 6. Plot demonstrating trending interaction of perceived stress and teacher academic support (TAS) with the outcome of behavioral engagement in the final model.

Appendix B

Questionnaire Items

Perceived Stress: Modified version of the Perceived Stress Scale – 10 item version (Cohen & Williamson, 1988). Reversed items: 4, 5, 7, 8. Rating Scale: 1 = Never, 2 = Almost Never, 3 = Sometimes, 4 = Somewhat Often, 5 = Very Often.

These next questions are about how you felt and what you thought during the last week:
In the last week…*Think about a time when something unexpected happened.*

1. How often did you get upset because something you did NOT expect happened?

Think of a time when you did NOT like something that was happening.

2. How often did you feel like you could NOT do anything to change the way things were going?
3. How often did you feel nervous and "stressed"? [*in general, when you're in school*]

Think about a problem you have had.

4. How often did you feel like you could make your problems better?
5. How often did you feel like things were going right for you?
6. How often were you too upset to do all the things you had to do?

Think about a time when you were frustrated

7. How often did you feel like you could deal with the things that frustrated you? [*or do something to feel better or fix the frustrating problem?*]
8. How often did you think about your schoolwork and think, "I can do all of this!"?
9. Think about a time there were things you could NOT change. How often did you get mad about that?
10. How often did you feel like there were so many hard things to do that you just could NOT do them all?

Student-report Grit-S: a modified version of The Grit Short Scale (Grit-S) (Duckworth & Quinn, 2007). Reversed items: 1, 2, 4, 5, 7. Rating scale: 1 = Not at all, 2 = A little, 3 = Somewhat, 4 = Mostly, 5 = Very Much.

1. My school work is difficult and makes me want to give up.
2. I get very interested in a new topic in school, but then I quickly get bored with it.
3. I am a hard worker in school.
4. I often set a goal in school but later give up and choose a different goal. [Do you complete that first goal?]
5. It's hard to focus on schoolwork that takes a long time to complete.
6. I finish whatever I begin in school.
7. Other things sometimes distract me from what I am already working on in school.
8. I work steadily in school without giving up. [Like, when you are working, you just keep doing it and are persistent.]

Teacher-report Grit-S: a modified version of The Grit Short Scale (Grit-S) (Duckworth & Quinn, 2007). Reversed items: 1, 2, 4, 5, 7. Rating scale: 1 = Not at all, 2 = A little, 3 = Somewhat, 4 = Mostly, 5 = Very Much.

1. The student finds work difficult and it makes him or her want to give up.
2. The student gets very interested in a new topic in school, but then quickly gets bored with it.
3. The student is a hard worker in school.
4. The student often sets a goal in school but later gives up and chooses a different goal.
5. It's hard for the student to focus on schoolwork that takes a long time to complete.
6. The student finishes whatever he or she begins in school.
7. Other things sometimes distract the student from what he or she is already working on in school.
8. The student works steadily in school without giving up.

Peer Academic Support: modified from the Peer Academic Support subscale of the Classroom Life Instrument (Johnson, Johnson, Buckman, & Richards, 1985). Rating scale: 1 = Not at all, 2 = A little, 3 = Somewhat, 4 = Mostly, 5 = Very Much.
These next questions ask about *how* your teachers and your classmates treat you:

These next questions ask about *how* your teachers and your classmates treat you:

Peer Academic Support subscale

1. My classmates care about how much I learn.
2. My classmates like to help me learn. [*Even if you don't need their help*].
3. My classmates want me to come to class every day.
4. My classmates want me to do my best school work.

Teacher Academic Support: modified from the Teacher Academic Support subscale of the Classroom Life Instrument (Johnson, Johnson, Buckman, & Richards, 1985). Rating scale: 1 = Not at all, 2 = A little, 3 = Somewhat, 4 = Mostly, 5 = Very Much.

These next questions ask about *how* your teachers and your classmates treat you:

Teacher Academic Support subscale

1. My teacher cares about how much I learn.
2. My teacher likes to see my work.
3. My teacher likes to help me learn.
4. My teacher wants me to do my best in school work.

Student-report Behavioral Engagement: from the behavioral engagement subscale of the Engagement versus Disaffection with Learning: Student-Report scale (Skinner, Furrer, Marchand, & Kindermann, 2008). Rating scale: 1 = Not at all, 2 = A little, 3 = Somewhat, 4 = Mostly, 5 = Very Much.

1. I try hard to do well in school
2. In class, I work as hard as I can.
3. When I'm in class, I participate in class discussions.
4. I pay attention in class.
5. When I'm in class, I listen very carefully.

Student-report Emotional Engagement: from the emotional engagement subscale of the Engagement versus Disaffection with Learning: Student-Report scale (Skinner, Furrer, Marchand, & Kindermann, 2008). Rating scale: 1 = Not at all, 2 = A little, 3 = Somewhat, 4 = Mostly, 5 = Very Much.

1. When I'm in class, I feel good.
2. When we work on something in class, I feel interested.
3. Class is fun.
4. I enjoy learning new things in class.
5. When we work on something in class, I get involved.

Teacher-report Emotional Engagement Scale: from the emotional engagement subscale of the Engagement versus Disaffection with Learning: Teacher Report (Skinner, Kindermann, and Furrer, 2009). Rating scale: 1 = Not at all, 2 = A little, 3 = Somewhat, 4 = Mostly, 5 = Very Much.

1. In my class, this student is enthusiastic.
2. In class, this student appears happy.
3. When we start something new in class, this student is interested.
4. When working on classwork, this student seems to enjoy it.
5. For this student, learning seems to be fun.

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