Adolescent Perceptions of Parent's Failure and Intelligence Mindsets

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ABSTRACT

Jessica Lynne Hayden: The Development of Growth Mindset in Adolescence
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Children's beliefs about the stability of intelligence (intelligence mindset) has been found to influence motivation and academic achievement (e.g., Blackwell, Trzesniewski, & Dweck, 2007; Romero, Master, Paunesku, Dweck, & Gross, 2014; Claro, Paunesku, & Dweck 2016). Messages parents communicate to their fourth and fifth grade children about academic failure have been found to be more predictive of their children's intelligence mindset than messages about their beliefs about intelligence (Haimovitz & Dweck, 2016). While this may be true for elementary students, research on the influence of parent beliefs about intelligence and failure has not been explored in adolescent populations. The current exploratory study addresses gaps in past research by examining relationships between adolescent self-reported beliefs about intelligence, achievement goal orientation, academic self-efficacy, and academic outcomes; and their perceptions of their parent's beliefs about intelligence, failure, and achievement goal orientation, as well as their experiences of dissonance in terms of feelings of discomfort due to differences in values, beliefs, and behavioral expectations between home and school. Students (N = 145) in a sixth to twelfth grade rural charter school, were surveyed about their beliefs, and what they perceived their parents to believe. Findings revealed significant associations between perceptions of parent intelligence mindset and adolescent intelligence mindset in all grades except eighth and twelfth. Students endorsing strong beliefs that intelligence can't change, were

also likely to view their parents as having strong beliefs that failure is debilitating to the learning process and strong beliefs that intelligence can't change, but the beliefs of older students were not as strongly associated with the beliefs they perceived their parents to hold. Adolescent intelligence mindset (growth and fixed) was not a significant predictor of academic outcomes, nor were the perceptions of parent beliefs about mindset (failure and intelligence). However, after controlling for demographic factors, perception of dissonance between home and school and academic efficacy, were found to play a significant role in academic achievement. Findings have implications for education of adolescents and the role of parent influences on adolescent intelligence mindset and academic achievement.

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LIST OF ABBREVIATIONS

AP   Advanced Placement

ELA   English Language Arts

GPA   Grade Point Average

PALS   Patterns of Adaptive Learning Scales

PPFM   Perceptions of Parent Failure Mindset

PPGM   Perceptions of Parent Growth Mindset

SAT   Scholastic Aptitude Test

TOI   Theories of Intelligence

CHAPTER I: INTRODUCTION

Adolescence is marked as a difficult developmental period for students, as students transition from elementary to middle and high school. This developmental stage has been linked to decreased motivation (Anderman Maehr, & Midgley, 199), academic achievement, and self-esteem; and increases in psychological distress (Chung, Elias, & Schneider, 1998). Student belief systems, or mindsets, have been found to temper the deleterious effects of this transition (Blackwell, Trzesniewski, & Dweck, 2007; Hong, Chiu, Dweck, Lin, & Wan, 1999). In response, researchers, educators, and policy makers have been increasingly interested in developing academic mindsets in adolescence (Nagaoka & Farrington, 2015). Academic mindsets are beliefs that one holds about their academic abilities and academic settings. According to Dweck (1986), intelligence mindset refers to one's belief about their own intelligence. Growth mindset is the belief that intelligence can be developed over time; while fixed mindset is the belief that intelligence can't grow or develop. Those holding a growth mindset are more likely to persist, seek challenge and use failure as a learning experience (Dweck, 1986, 2006). In contrast, those who hold a fixed mindset (the belief that intelligence cannot change) or entity view of intelligence have been found to give up more easily, and avoid challenges and effort (Blackwell, et al., 2007; Robins & Pals, 2002). In the face of failure, those endorsing a fixed mindset are more likely to engage in ineffective coping strategies, question their ability, experience increased feelings of helplessness (Dweck & Leggett 1988; Hong et al., 1999), and experience significant feelings of anxiety about negative feedback (Schroder et al., 2017).

Growth mindset has been associated with adaptive outcomes including self-regulated learning (Dweck & Master, 20008), academic achievement (Blackwell, et al., 2007), and the use of corrective strategies when faced with failure (Nussbaum & Dweck, 2008). According to the literature, mindsets shape interpretations of failure and performance, and have been found to improve academic achievement in underrepresented minorities and women in the math and sciences (Aronson, Fried, & Good, 2002; Good, Aronson, & Inzlicht, 2003; Good, Rattan, & Dweck, 2012), historically male dominated fields.

Claro, Paunesku, and Dweck (2015) found that children's mindsets temper the effect of poverty, one of the most significant predictors of academic success (Reardon, 2011) suggesting the impact of growth mindset for narrowing the achievement gap. These findings would support the use of growth mindset intervention as a viable strategy for schools to utilize for their everyday practices.

A wealth of research has focused on the impact of teacher and school interventions on growth mindset in teens, but few studies have targeted parent influence on growth mindset. Given the growing body of literature on the effect of mindset on academic and social emotional outcomes (Aronson, et al., 2002; Good, et al, 2003; Good, et al., 2012), it is important to expand on this research to gain a better understanding of the relationships between adolescent and parent intelligence mindset.

CHAPTER II: REVIEW OF THE LITERATURE

This chapter provides an overview of adolescent transition to junior high school and high school, the social-cognitive framework of the origins of growth mindset as an academic motivational construct, development of growth mindset, applications of mindset, and parent influence on growth mindset.

School Transition in Adolescence

Adolescence has been targeted as a critical period in human development, marked by rapid growth and maturation, shifting academic demands, navigation of more complex social relationships, novel education experiences, and increased societal expectations (e.g., Chung, Elias, Schneider, 1998; Akos, 2004). Transitions from elementary school to middle school and from middle school to high school have been found to be significant times of distress for students (Chung, 1998). Specifically, the transition from elementary school to junior high has been associated with problems impacting academic performance (Blyth, Simmons, & Carlton-Ford, 1983). Eccles, Midgley, and Adler (1984) found for students, the transition to middle school marks an increase in negative feelings about school and themselves. School environments have not historically catered to the developmental needs of adolescence and have been shown to emphasize competition, social comparison, and increased ability attributions (Eccles, Midgley, et al., 1993). The incongruent matching of school environment to student needs has resulted in heightened school anxiety (Harter, Whitesell, & Kowalski, 1987), lower self-concept (Parsons, Adler, Meece, 1984), and a reduction in intrinsic motivation (Harter, 1981) and disengagement from school (Eccles, Midgley, et al., 1993).

Motivation and Achievement in Adolescence

Adolescents face many challenges during middle school and high school that affect academic experiences, motivation, self-perception, and self-regulatory beliefs (Parker, 2013; Perkins, 1995). There is a wealth of evidence demonstrating a decline in academic motivation and achievement in early adolescence and high school (Dweck, 2002; Eccles & Midgley, 1989; Eccles, Midgley, et al., 1993; & Eccles, 2002). These transitions have been associated with declines in achievement (Alspaugh, 1998; Blackwell, Trzesienowski, & Dweck, 2007), decreases in motivation (Eccles et al., 1993), increases in test anxiety (Wigfield, Byrnes, & Eccles, 2006), and focus on self-evaluation and performance rather than task mastery (Anderman & Midgley, 1997); which predicts truancy, dropout, and high school failure (Roeser & Eccles, 1998).

Interestingly, not all students experience decreased motivation and disengagement in school. Some students thrive and can overcome the challenges and setbacks of the transitions in adolescence (Henderson & Dweck, ,1990; Wigfield & Eccles, 2002). Research has focused on preventative measures building on students' protective factors and identifying ways to increase resilience in adolescence during the transition period.

Protective Factors

Students demonstrating resiliency through stressful events have been found to possess positive personal coping resources such as a sense of autonomy, personal self-efficacy, a sense of self-competence (Bandura, 1986; Harter, 1990), and incremental theories of intelligence (Blackwell, et al., 2007). Of increasing interest is the impact of implicit theories of intelligence on resilience and response to academic challenges. Also known as "intelligence mindset", implicit theories of intelligence are a person's beliefs about the malleability of their own personal attributes (Dweck, et al., 1995). Those who believe intelligence to be unchangeable and

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predetermined at birth are considered entity theorists, while those who think of intelligence as something that is malleable and can be developed are considered incremental theorists (Dweck, 1999).

According to Dweck (1999), incremental theorists (or those with growth mindset) can be described as those who (a) focus on learning goals (aimed at increasing ability); (b) believe that effort is both useful and necessary for growth and mastery; (c) attribute failure to low effort; and (d) demonstrate change in effort or strategy when facing challenges (mastery-oriented strategies). Conversely, entity theorists (a) focus on performance goals (aimed at demonstrating ability); (b) believe increased effort indicates low ability; (c) attribute failure to ability or helplessness; and (d) display helpless strategies, inflexible strategy use, and avoidance when faced with challenge. Dweck, et al. termed the motivational framework *Implicit Theories of Intelligence*, and more recently has termed it *Mindsets.* Before exploring how this motivational framework impacts students, it is important to first explore the theoretical underpinnings of implicit theories of intelligence.

Social-Cognitive Perspective of Achievement Motivation

Social-cognitive theory assumes that a) people can learn by observing others; b) learning is a process that may or may not lead to a behavior; c) behavior is goal directed; d) behavior becomes self-regulated; and e) reinforcement and punishment have an indirect effect on learning and behavior (Schunk, Meece, & Pintrich, 2012). It is through observation and interaction with others that knowledge, strategies, beliefs, rules, and attitudes are learned. These interactions offer a mechanism by which people learn about appropriateness, usefulness, and the consequences of their behaviors. Motivational processes involved in academic achievement, according to this theory include goals and self-evaluations of progress, outcome expectations, values, social

comparisons and self-efficacy (Schunk & Usher, 2012). Current theories of motivation propose that an individual's thoughts, beliefs, and emotions are central to motivation towards learning (Schunk, 1991).

Born out of self-efficacy, learned helplessness, implicit theories, attribution theory, and goal orientation research, Dweck and Leggett's (1988) social-cognitive approach to motivation and personality specified how individuals' implicit theories of intelligence oriented them to set different goals and influenced their perceived ability (attributes), their cognitive and affective response mechanisms, and their behavior patterns. The role of self-efficacy, control beliefs, goal orientations, attributions, and response to failure lay the foundation of implicit theories of intelligence.

Self-Efficacy. Self-efficacy, the perception one has about their abilities to perform a specific task impacts cognitive processes in a variety of aspects (Bandura, 1997). Students with high self-efficacy demonstrate higher academic motivation in choices of activities, higher level of effort (Schunk & Hanson, 1985), persistence (Schunk, 1981), and moderated emotional reactions (Pajares & Kranzler, 1995). Additionally, self-efficacy has been linked to the self-regulated learning constructs of monitoring, self-evaluation, use of learning strategies, and academic achievement (e.g., Pintrich, 2004).

Academic self-efficacy, as defined by Schunk (1991), refers to the perception that one can successfully perform specific tasks at varying levels of difficulty. This definition varies slightly from academic-concept, which is the perception of success in a specific academic situation, as determined by one's knowledge about themselves (Wigfield & Karpathian, 1991). This distinction, while slight, illustrates the reason why some students feel confident in their ability to perform a specific task within a subject (efficacy), but feel incompetent about their

ability in the general subject (concept). Students often experience this phenomenon as they attribute their perceptions to their abilities to succeed (Pajares & Miller, 1994). Both efficacy and concept operate on perceptions of abilities to perform a task within a discipline or to do well in that discipline holistically (Zimmerman, 1995). *Perceived capabilities* can be conceived as outcomes people anticipate based on their own judgements of their ability to perform in certain contexts (Bandura, 1986).

Self-efficacy has also been found to be related to goal-setting behavior. According to Zimmerman, Bandura, and Martinez-Ponz (1992) a student's judgement of capability is directly related to setting more challenging goals. Goal setting behavior determines adaptive or maladaptive responses to challenges (Bandura, 1997). Students with adaptive responses seek challenges and persist on difficult and challenging tasks, whereas students with maladaptive responses may avoid challenge and/or exhibit limited persistence (Dweck, 1986). Over the past three decades, Dweck (1986) and colleagues have studied the impact of these self-efficacy beliefs and individual attributions. (Dweck & Bempechat, 1983; Dweck & Leggett, 1988; Dweck, 2006). Task avoidance and diminished persistence are characteristics of learned helplessness.

Control Beliefs. Research on learned helplessness led to the understandings of attributions and indicators of *control beliefs* (e.g., Dweck & Reppucci, 1973; Weiner, 1972). Learned helplessness refers to the learning or perception that one has no control over their ability to overcome aversive events (Abramson, Seligman, & Teasdale, 1978). Interested in determining the impact of learned helplessness on children's internal vs. external attribution outcomes, Dweck and Reppucci (1973) found that fifth grade children, who are the most likely to give up in the face of failure, take less personal responsibility for their success and failures, and tend to

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attribute their outcomes to their ability rather than their behavior. That is, children who demonstrated characteristics of helplessness were more likely to attribute failure to the lack of ability and less likely to respond to failure with effort or perseverance (e.g., Dweck & Repucci, 1973; Weiner & Kukla, 1970).

Diener and Dweck (1978; 1980) further investigated the response styles of fifth grade children of similar ability level and their approach to a difficult concept formation task. Children were asked to complete easier tasks in the beginning, but by the end the tasks grew increasingly complex and extremely difficult to complete in the given amount of time. All children completed the initial tasks with ease but failed to complete the more complex tasks. Analysis of cognition, affect, and behavior during the complex tasks revealed two polarized response styles that Diener and Dweck (1980) termed *helpless* and *mastery-oriented*. Deiner and Dweck (1980) found that children with mastery-oriented responses endorsed the difficult items as being challenging, demonstrating positive affect and optimism about their ability. Of these children, 80% maintained or increased problem-solving strategies during the more complex trials, engaging in verbal strategies and hypothesis testing that guided their performance. Conversely, children with helpless-oriented responses expressed negative self-talk focusing on perceived incompetence, negative affect, and a desire to "give-up." Additionally, and perhaps most alarming, 60% of these children demonstrated a decline in their use of effective strategies, as demonstrated during the easier tasks (Diener & Dweck, 1980).

In efforts to further understand these responses, Licht and Dweck (1984) conducted a study that examined differences in mastery and helpless oriented, fifth grade children when faced with a task that elicited confusion. There was no difference in learning between the groups of students when faced with the non-confusion task; however,, when faced with the confusion task,

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students with a mastery-oriented attributional style significantly outperformed those with a helpless style. These results further supported the notion that achievement could be impacted by children's control (attribution) orientations and the level of demands of specific skill areas (Licht & Dweck, 1984).

Goal Orientations. Achievement motivation theorists have studied the role of two types of goals impacting motivation: *learning goals* and *performance goals*. Learning goals are associated with the desire to increase competence by mastery and understanding of novel tasks; while performance goals are associated with avoidance of negative judgments of competence, or desire to gain favorable external judgments of competence (Nicholls, 1984).

Students with mastery goals have also been found to have positive self-perceptions of academic ability and self-efficacy (Midgley et al., 1998), increased persistence (Elliot & Dweck, 1988), and use of deeper adaptive strategies for learning (Meece & Miller, 2001). Conversely, students exhibiting performance goals engage in more cognitive learning strategies (memorization), which do not positively relate to a deeper understanding of information (Grant & Dweck, 2003). Performance goals have been associated with cheating (Anderman, Greisinger, & Westerfield, 1998), lower grades (Elliot & Church, 1997), and maladaptive learning strategies (Urdan, Midgley, & Anderman, 1998).

Elliot and Dweck (1988) tested the hypothesis that fifth grade children who demonstrated a mastery response style would also demonstrate a learning goal orientation; while children exhibiting helpless response styles would likely demonstrate performance goal orientations. Students who held learning goals sought to gain competence and did not attribute failure to ability. These students demonstrated positive affect and interest in challenging tasks. Conversely, students who were more performance goal oriented, relied more on their perceived ability levels,

demonstrating a helpless response style. These students were more likely to give up, avoid negative judgments, and express the desire to prove competence.

Effort vs. Ability. Not only do people have beliefs about specific attributes, but also about the nature of attribute existence. Attributes take the shape of being entity (fixed) or incremental (growth) views. An entity view, or fixed mindset, assumes a trait is static, stable, innate, and unchangeable. On the other hand, an incremental (growth) view, implies traits are malleable, and can be changed. These views can ultimately impact behaviors, cognitions, perceptions, and responses (Dweck & Leggett, 1988; Dweck, 2008; Dweck, 2009; Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013). It has been shown that these mindsets are related to goal orientation (learning vs. ability validation; e.g., Dweck & Leggett, 1988), different views of effort (productive vs undermining; e.g. Blackwell, et al., 2007), and different reactions to set-backs (mastery oriented vs. helpless; Blackwell, et al., 2007; Hong, et al., 1999).

Studies on attribution theory and goal orientation have highlighted the differences in perception of effort between those with learning goals/mastery response orientations and those with helpless responses/performance goal orientations (Diener & Dweck, 1980; Elliot & Dweck, 1988; Licht & Dweck, 1984). Students with performance goals attribute their negative performance to lack of ability, rather than lack of effort, leading to helpless coping styles when faced with failure or challenging tasks. This type of orientation can be understood to undermine resilience (Blackwell, et al., 2007).

Students with mastery goals tend to attribute failure to a lack of effort, which, when employed has the potential to improve their likelihood of overcoming failure or mastering a challenging task (Hong, et al., 1999). When faced with failure, these students may look for different ways to improve their ability and performance by exerting more effort or by exploring

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the use of different strategies. Placing more value on effort over outcomes leads to a resilient coping style and increases self-regulated learning (e.g., Pintrich, 2004).

Dweck, Chiu, and Hong (1995) demonstrated that attributions are pivotal in motivation and are central to one's style of coping, but do not address strategies for achievement or the belief systems people have about particular situations. In response to these missing links, Dweck (1996) proposed a motivational model that demonstrated how implicit theories direct one's beliefs about ability, that guides their choice and pursuit of goals. This framework posits that people's implicit theories of intelligence guide their motivations prior to an outcome and create a meaning system within which attributions occur.

Theories of Intelligence

In efforts to optimize educational experiences and learning, factors contributing to student achievement and non-cognitive skills have been researched, with a focus on students' perceptions about their competence (Leondari & Gialamas, 2002). Student's beliefs about their academic competence can affect their achievement and how they behave in academic settings (Weiner, 1992; Stipek & Gralinski, 1996). When faced with challenging tasks, these beliefs promote learning by influencing engagement in self-regulation (Dweck, 1999).

Following their initial model of implicit theories, Dweck and colleagues (e.g., Molden & Dweck, 2006) proposed that implicit theories of intelligence provide a broad cognitive framework that orients the cognitions, emotions, and behavior in academic contexts. This framework posits that people's implicit theories orient them to specific goals that they pursue, allowing them to make sense of and react to events such as setbacks, and to make action plans in response (Molden & Dweck, 2006).

Growth Mindset and Achievement

Curious about the relationship between implicit theories of intelligence (mindset) and academic achievement, Dweck and colleagues have conducted numerous studies with middle school students to measure the impact of mindset on achievement (e.g. Blackwell, et al., 2007; Romero, Master, Paunesku, Dweck, & Gross, 2014; Claro, et al., 2016). Students with incremental beliefs of intelligence (growth mindset) see intelligence as malleable; view challenges as learning opportunities; and view failure and mistakes as part of the learning process. Students holding an entity view of intelligence (fixed mindset) reject challenging academic tasks for fear of failure; attribute mistakes to lower intelligence and fixed abilities; and believe that intelligence is stable.

In a longitudinal study measuring theory of intelligence and achievement amongst junior high students in a New York City school, Blackwell, et al., (2007) found that adolescents who reported stronger beliefs that intelligence is malleable also endorsed stronger learning goals, held positive beliefs about effort and made fewer ability based "helpless attributions, than adolescents who reported stronger beliefs that intelligence is fixed. In turn, students who reported stronger growth mindset chose more positive, effort-based strategies in response to failure, boosting mathematics achievement over the junior high school transition. Incremental theorist students in this study increased their math grades over two years compared to those endorsing an entity theory. This was the first study to fit a viable model demonstrating the effects of incremental theories on learning goals, effort beliefs, positive strategy use, and low helplessness attributions on grades.

Romero and colleagues (2014) examined the impact of implicit theories of intelligence on the academic and emotional functioning of growth trajectories of students (N=115) from sixth

through eighth grade of students in a suburban school. Findings indicated that students who endorsed higher scores in 6th grade on growth mindset had higher grades and chose more challenging math courses in 7th and 8th grade, than students who endorsed higher fixed mindset in 6th grade.

Additionally, mindsets have been shown to temper the impact of poverty on academic success. Claro, et al. (2016) examined the relationship between mindset and academic achievement across the entire nation of Chile. Using a national dataset of all tenth-grade students in Chile, the researchers attached the measure of growth mindset to the annual standardized tests administered to tenth grade students. They found that an incremental or growth mindset reliably predicted achievement across a national sample, and in students from low socioeconomic backgrounds. The study revealed that students from lower-income families were less likely to hold a growth mindset compared to their more economically advantaged peers, but those in poverty holding a growth mindset demonstrated higher achievement than their peers who held a fixed mindset.

While these studies offer significant implications about the positive effects of having a growth mindset, several limitations in the research exist. Academic achievement can be an ambiguous term as measures for academic standards vary across different contexts. Some schools require homework and effort to be included in final grades, while others do not. Li and Bates (2017) were unsuccessful in their attempts to replicate studies by Mueller Dweck (1998), Dweck (1999), and Blackwell, et al. (2007). The researchers found that the belief about fixed ability was not significantly related to academic achievement (grades) with Chinese subjects from the People's Republic of China (Li & Bates, 2017).

Additionally, various studies have shown that mindsets may not directly impact

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achievement, but instead mediate the relationship between mastery goals and achievement (Dupeyrat & Marine, 2005; Leondari & Gialamas, 2002). That is, having a mastery approach goal orientation is predictive of academic success, and those who have a mastery goal approach are more likely to have growth mindset. Bahnik and Vranka (2017) found no statistically significant differences in Scholastic Aptitude Test (SAT) scores between university students (N = 5,653) who endorsed high scores on the growth mindset measure compared to those who endorsed low scores on the same measure. Further, a study conducted by the Education Endowment Foundation (2019), in England, revealed no significant differences between control and treatment groups following the implementation of a mindset intervention with (n = 5018) sixth grade students. Students in the eight-week intervention showed no more progress in literacy, numeracy, reading, grammar, punctuation, spelling, and math compared to those in the control group. Likewise, students, who received the intervention, did not demonstrate statistically significant differences in their non-cognitive skills: intrinsic value, self-efficacy, test anxiety, and self-regulation compared to students who did not receive the intervention (Education Endowment Foundation 2019).

Despite these limitations, Zhang, Kuusisto, & Tirri (2017) found, after reviewing 22 articles from 1998 to 2017, most research on mindset has demonstrated students' mindset to play the roles of cause and mediator of academic achievement; supporting Dweck's theory of mindsets.

Development of Motivation

Mindsets. Mindsets can be influenced to be more growth oriented or fixed oriented via social interaction and intervention (Blackwell, et al., 2007; Moorman & Pomerantz, 2010; Dweck & Leggett, 1988), but how does mindset develop naturally?

The Definition of Intelligence. Researchers have shown that younger children identify being "smart" or "intelligent" as having knowledge and attaching social connections to their beliefs. As children mature into late elementary, they describe intelligence as "having an abundance of knowledge and demonstrating academic success", while middle schoolers attach this knowledge to traits of the process of intelligence (e.g., Yussen & Kane, 1985; Lepper, Henderlong, & Gingras, 1999; Kurtz-Costes, McCall, Kinlaw, Wiesen, & Joyner, 2003). Studies of mindsets over time indicates some evidence that more kindergarteners and first graders view ability to be incremental compared to older students (Harari & Covington, 1981).

A two-part study by Bempechat, London, and Dweck (1991) found that it is not until third grade that children begin to distinguish between attributes and apply different theories to different attributes (such as intelligence, behavior, or physical appearance), by fourth grade their theories determine how they judge the attributes of others, and by fifth grade their theories impact their recovery from failure in a novel academic task. Bempechat, London, and Dweck (1991) discovered this by first asking children in Kindergarten through fifth grade a series of questions, such as, "some kids say you can get smarter and smarter (nicer and nicer; better and better at games and sports; prettier and prettier) all the time" and "other kids say you're a certain amount of smart (etc.)". They then asked children to think of someone they knew who is smart in schoolwork, nice, good at games and sports, pretty/handsome, and to tell the interviewer why they thought of those people. The children's answers were coded and placed in two categories: entity or incremental ideas. The kindergarten children they interviewed had different ideas about intelligence and attached it to different attributes such as looks, drawing, and athletic ability. Children in first through fourth grade typically explained intelligence in terms of outcomes, such as, "I know she's smart because she gets A's", while fifth-grade students with incremental

mindsets were much more likely to attribute success in others to their actions, such as studying or practice.

In the second part of the study Bempechat and colleagues (1991) discovered that fifth and sixth grade children's theories could be manipulated. Participants were given directions to complete a task that were oriented to fixed or incremental theories of intelligence. The researchers then asked participants to choose goals and judge their own performance. Children who were assigned to the incremental condition were more likely to choose learning goals over performance goals and children in the entity condition readjusted their expectancies more than those in the incremental group. The researchers concluded that introducing a fixed ability task initiated maladaptive views of achievement, whereas incremental ability directions reinforced and enhance adaptive views of achievement (Bempechat, London, & Dweck, 1991).

Multiple studies have investigated the development of beliefs about the component structure of intelligence, by investigating beliefs about verbal and nonverbal abilities (e.g. Nicholls, Patashnick, & Mettetal, 1986; Nicholls et al., 1984). These studies found that older students endorsed verbal tasks being easier to learn than nonverbal tasks, whereas younger children endorsed tasks involving verbal ability to be more indicative of being smart or having knowledge. Critics have argued, however, that as children develop they are exposed to the "institution of assessment of intellect", which forms their opinions about intelligence (Rosenholtz & Simpson, 1984). This means, throughout their lives, students are exposed to messages from educational institutions that intelligence tests are important indicators of ability.

Other studies tasked kindergarten, fourth, and eighth-grade children with nominating the smartest children in the classroom and to predict their performance in reading, a spatial task, sharing, and jumping a hurdle (Stipek & Daniels, 1990). Findings suggest that as young

children's theories about intelligence become more mature, they begin to use their perception of ability to interpret performance differences among children, indicating an understanding of causal outcomes (Stipek & Tannatt, 1984). When asked about the criteria used to judge intelligence, younger students have difficulty providing clear definitions for intelligence ("smartness"), and when they do, their responses are simplistic and broad, indicating a "good-bad" scheme of conceptualization (Bempechat et al., 1991; Heyman, Dweck, & Cain, 1992). These schemas suggest that younger children have not yet developed the ability to differentiate conceptualizations to make reliable judgments.

Thus, the development of theories of intelligence imply that younger children characterize knowledge as something one has, whereas older children place significance on a range of definitions from the process of using knowledge, to other characteristics of intelligence such as work habits and behavior associated with being smart (Yussen & Kane, 1985).

Muenks and Miele (2017) argue that this conceptualization of the development of implicit theories may only appear to follow the traditional developmental trajectory because researchers have not investigated the impact of different combinations of beliefs and environmental contexts. Muenks and Miele (2017) posit that children may apply different ideas about effort and ability depending on context. Certain environmental cues (e.g., social comparison and competition) and beliefs (e.g., an entity theory of intelligence) lead students to think in terms of an inverse relation between effort and ability, whereas other environmental cues (e.g., classrooms goals for understanding; see Middleton & Midgley, 2002) and beliefs (e.g., an incremental theory of intelligence) may lead students to think in terms of a positive relation.

Children as young as four to six-years old show an understanding that increased effort leads to ability (Heyman & Compton, 2006), but it is theorized that children don't fully

understand the relationship between effort and ability until age fourteen (Harari & Covington, 1981). More specifically, children may understand that hard work leads to high level of ability in some situations such as in sports, but not in others such as math. Surber (1984) argues that these differences may be attributed to the differences in the cognitive demands of the tasks being required of children. The task of reasoning between ability and effort may be more cognitively demanding for younger children and may not emerge in studies where processing task demands are high. Therefore, the study of theories of intelligence might be more reliable once children enter middle and high school.

Parent Impact on Motivation and Achievement

Social-cognitive theorists agree that interpersonal relationships are highly influential in academic motivation (Juvonen & Wentzel, 1996; Wentzel, 1998; Dweck & Haimovitz, 2016). Perceived social and emotional support and family cohesion have been positively associated with perceived competence, sense of relatedness, and academic effort and interest in school (Cauce, Felner, & Primavera, 1982; Connell, Spencer, & Aber, 1994).

Autonomy-supportive parenting styles (i.e. Authoritative) has been shown to promote adaptive motivational processes in children (Pomerantz, Grolnick, & Price 2005). Conversely, controlling or permissive parenting styles undermine motivation and resilience. Parental expectations, mindset (Moorman & Pomerantz, 2010), goals and aspirations (Wentzel, 1998), and use of language (Gunderson, et al., 2013) have all been shown to significantly impact the mindset, graduation rates, and academic achievement of their children.

Goals. Consistent with evidence of the positive relationship between parenting practices on mastery goal orientation, Wentzel (1998) found that perceived parental support predicted adolescent's academic goal orientations. In efforts to determine the relationship between

perceived quality of relationships with parents, teachers, and peers and goals and academic interests, Wentzel surveyed (N= 167) sixth grade students from a suburban, middle class community on their goal orientations; distress; interest in school and class; and perceived support from parents, teachers, and peers and their impact on academic achievement. Findings from the study suggest that peer support predicts pro-social goal pursuit, while parent support was a positive predictor of school-related interest and goal orientations. Overall parent, peer, and teacher supportive relationships were indirectly related to GPA through school and class related interest and pursuit of goals. This study supports the evidence that motivational processes are interpersonal outcomes that might explain the connection between socialization experiences and academic achievement (e.g., Eccles, 1993). More specifically, findings underscored the importance of parenting relationships in adolescent academic motivation.

Home-School Dissonance. Students who feel their parents share similar values and beliefs as their school culture tend to perform better in school as there is a mutual trust and goal consensus (Phelan, Davidson, & Cao, 1991). Some children are able to integrate their roles in one context when difference between parents and home conflict, while others struggle (Levine & Moreland, 1995). It is especially troublesome when children experience discomfort when one context (i.e. home) conflicts with another by sending degrading or devaluing messages to students. Feelings of "dissonance" between home and school have been linked to lower achievement, cheating behavior, disruptive classroom behavior, decreased academic self-efficacy, increased feelings of hopelessness about the future, and increased feelings of anger and self-deprecation (Arunkumar, Midgley, Urdan, 1999; Brown-Wright, Tyler, Graves, Thomas, Steven-Watkins, & Mulder, 2013).

Attributions. Most aligned with mindset development is the role of parent attributions

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and interactions in shaping children's self-perceptions of ability. Frome and Eccles (1998) identified the following beliefs that impact development of their children's beliefs: expectations and confidence in abilities; beliefs about failure and strategies for success; attributions of performance; standards; and values. That is, a child's self-perception of competence can be predicted by the expectations that parents and teachers have of a child's level of competence (e.g., Frome & Eccles, 1998). Competence related beliefs in children are strongly related to performance (Dweck, 2002). In both math and English, mother's perceptions of their children's ability and effort were stronger predictors of children's self-perceptions than their child's past performance. Frome and Eccles (1998) posit that parents may influence expectancies through the messages they provide to their children regarding their perceptions of their children's ability and effort.

Parent Praise. Parent praise has been found to be an important mechanism by which children internalize beliefs about ability and effort. Mueller and Dweck (1998) found that when children are praised for effort (process praise) they are more likely to persist on difficult tasks and attribute success to their own hard work. Conversely, when children are praised for their ability (person praise), they are much more likely to believe these sources of their success are fixed, leading them to helpless coping styles, in turn thwarting perseverance (Zentall & Morris, 2010).

Using observational qualitative data, Gunderson and colleagues (2013) studied the style of praise parents of toddler children used and its impact on their children five years later. Researchers observed parent patterns of praise of 53 families and their primary care givers in the natural home setting. Researchers visited the homes of the families every four months beginning when the child was fourteen months old and ending at thirty-six months. Researchers coded the

interaction between caregiver and children as either process praise ("good try") or person praise ("you're smart"). When children reached the ages of seven and eight, they were presented with oral questionnaires regarding their motivational framework. Parents were also surveyed to determine their incremental theories of intelligence. Gunderson and colleagues (2013) found a significant correlation between parents' use of process praise and children's beliefs (intelligence is malleable) and behaviors (preferring challenge, and attributing failure and success to effort associated with incremental theories. Gunderson and colleagues (2013) did not, however, find an inverse relationship in parent use of person praise and children endorsing an entity framework, and found that parents mindsets did not predict their children's mindsets.

Perceptions of Competence. Parent perceptions of their children's competence may predict their child's self-perception of competence (e.g., Frome & Eccles, 1998). Children's academic functioning is supported when parents hold positive perceptions of their child's academic competence. Frome and Eccles (1998) found that adolescent self-views in math and English were predicted by their parents' views of their ability and effort, despite having good grades. Parents' perceptions of their children's ability were more robust than teachers' perceptions in predicting children's academic achievement (Gut, Reinmann, & Grob, 2013).

Mindset. Theories on the development of mind-set (or implicit theories) in children via social constructs, such as parent and teacher influence, are based on research on expectancy effects (Bandura, 1977). Parent perceptions of their children's competence predict their child's self-perception of competence (e.g., Frome & Eccles, 1998). Parents who have a fixed mind-set have also been shown to have expectancies aligned with performance-oriented goals (grades, social comparisons). Parents with a fixed mindset have been found to attribute success or failure to internal, global, stable structures (ability is fixed), and parents with a growth-mindset have

expectancies that focus more on the mastery goals and the process of learning, attributing success to effort and contextual events (Moorman & Pomerantz, 2010). Parent and teacher behavior associated with these expectancies and goals (Friedel, et al., 2007) has been shown to impact the mind-set of children, but surprisingly, just having a teacher or parent who has a growth mind-set does not predict growth mind-set in children (Gunderson et al., 2013). Haimovitz and Dweck (2016) posit that failure mindsets of parents are performance and control oriented, causing parents to send distressing signals to their children that poor performance is worrisome; in turn, teaching their children that intelligence is fixed. Conversely, parent growth mind-set is not as visible, providing fewer emotionally explicit cues to their children. Research by Haimovitz and Dweck (2016) provides a good starting point to further understanding the impact of beliefs on performance goals and expectancies, which in-turn may impact the development of the beliefs their children hold.

Moorman and Pomerantz (2010) investigated the interactions between mothers and their young elementary school children, when their children were faced with challenging tasks. The researchers induced fixed mindset in one group by giving them oral and written directions indicating the importance of the study in determining ability. The second group was given directions worded to induce a growth mindset. The parents oriented to the fixed mindset condition were much more likely to display greater performance-oriented teaching (social comparison), were more controlling (did not allow children to make mistakes) and were more negative in their affective responses. Orienting mothers to growth mindset had little impact on their child's performance, but those oriented to a fixed or entity mindset resulted in an increased use of performance-oriented teaching, heightened control, and more negative affect, leading their children to display behavior associated with learned helplessness. In response to these findings,

Moorman and Pomerantz posited that parents holding fixed mindsets exhibit a higher degree of externalizing responses to their children's failure.

Failure Mindsets. In an effort to understand the inconsistent association between the mindsets of parents and their children, Haimovitz and Dweck (2016) studied parents' beliefs about failure. Haimovitz and Dweck (2016) found that parents who believe failure is a debilitating experience may have children who have stronger beliefs that intelligence is fixed. The findings suggest that this phenomenon may be attributed to the external and affective reactions of parents to their children's failures by focusing more on their children's ability or performance than on their learning. When parents believe failure is debilitating, they demonstrate concerns and behaviors that are visible to their children; which in turn shapes the development of their beliefs (implicit theories). These findings have significant implications as students' mind-sets, about intelligence, influence their motivation and achievement (e.g., Blackwell, et al., 2007; Mangels, Butterfield, Lamb, Good, & Dweck, 2006).

Understanding the impact of perceived parental failure mindsets can shape future intervention practices that targets behaviors and language parents use with their children when their children are faced with challenges and failure. This finding is significant, as children who can see failure and challenge as a means of learning, are more likely to master learning and attain academic achievement (e.g., Blackwell, et al., 2007; Mangels, et al., 2006). By focusing more on their children's ability or performance than on their learning, parents may send distressing signals to their children that poor performance is worrisome; in turn, teaching their children that intelligence is fixed. The focus on ability or performance is hypothesized to shape the development of their children's implicit theories (Haimovitz & Dweck, 2016).

If parents don't think their child can, with effort and perseverance, meet teacher

expectations, they may engage in dialogue with their children about "unfairness, difference, and fixed states". This type of behavior has the potential to negatively impact children's motivation to complete new tasks, especially when generalized comparisons are drawn (Cimpian, Arce, Markman, Dweck, 2007), failure is attributed to external controls (i.e. teacher expectations) (Dweck & Legget, 1988), or when failure is seen as being debilitating (Haimovitz & Dweck, 2017). These messages can unintentionally create mindsets in children that undermine resilience (Yeager & Dweck, 2012).

There is evidence that student mindsets have been shown to temper the deleterious effects of stereotype threat, poverty, and middle school transitions on academic outcomes in adolescence, but little is known how parent mindset impacts academic outcomes. Given the paucity of research, it is important to investigate the relationships between beliefs of parents and the beliefs of their adolescent children.

Purpose of the Current Study

Children's intelligence mindsets (i.e. beliefs about whether intelligence is malleable or fixed) have been shown to relate to their motivation and learning. Current research has not directly linked parents' intelligence mindsets to their children's mindsets but has found strong links between parents' failure mindset (i.e. beliefs about whether failure is debilitating or enhancing) and the intelligence mindsets of their fourth and fifth grade children. Evidence suggests that parents with fixed mindsets and/or failure is debilitating mindsets demonstrate behaviors that are more reactionary and visible to their sixth and seventh grade children and therefore more influential on shaping their beliefs (Haimowitz & Dweck, 2017). Research by Haimowitz and Dweck (2017) has gone further to demonstrate that perceptions children have of their parent's intelligence mindset may not align with the beliefs of their parent's belief of their

own mindset but does align with their parents' failure mindsets. Parents who believe failure is debilitating may focus more on their children's performance and ability versus on their children's mastery, learning from mistakes and failure.

It is likely that children's perceptions of their parent's mindset change as they mature and progress through school, and evidence suggests their understanding of intelligence becomes more complex (e.g., Yussen & Kane, 1985, Heyman & Compton, 2006). Evidence also suggests that mindsets are malleable and can be changed (Dweck, 1999). The questions that will be examined in this study are, whether, and how the messages that adolescents perceive from their parents regarding goals of achievement, beliefs about intelligence, and their responses to failure may be associated with their own mindset and academic outcomes. Critical aspects of home environment and socialization from parents such as attitudes toward homework, grades, tests, enrichment activities, and school involvement may be related to the child's own attitudes and subsequent motivation and school behavior. Although there is little research on the role of child perceptions of parent's intelligence and failure mindsets, there is strong evidence that perceived parent goals contribute to student motivational, emotional and behavioral patterns of learning, including mindset (Gonida, et al., 2007; Friedel, Cortina, Turner, & Midgely, 2010). Considering Dweck's (1999) framework of "theories of intelligence" encompass elements of achievement-goal orientation, self-efficacy, and coping strategies, it is likely that development and impact of mindset processes on academic outcomes mirror that of the development of goal orientation.

The primary purpose of this study is to extend Haimovitz and Dweck's (2016) research focusing on the relationships of fourth and fifth graders' perceptions of their parents' mindsets (failure and intelligence) and goal orientations (performance approach and mastery) by exploring the relationships between adolescent perceptions of their parent's failure mindset (enhancing vs.

debilitating) and perceptions of their parent's intelligence mindset (growth vs. fixed), in 6th through 12th grade students. (e.g., Gunderson et al., 2013; Haimovitz & Dweck, 2016).

This study will focus on student beliefs and perceptions of their parents' beliefs and how they relate to academic achievement, goal orientation, mindset, and academic efficacy. The rationale behind this strategy is based on the widely held belief that children are active organizers of their own experience, as well as research that has demonstrated more accurate accounts of parents' beliefs and behavior from their children, than from parents themselves (Grolnick, Ryan, & Deci, 1991). Results will point to our understanding of how adolescent's beliefs relate to their academic achievement, perceptions of their parents' beliefs about intelligence and failure, and their perceptions of intelligence. Specifically, the following research questions will be explored:

Research Question 1: Are there associations among adolescent beliefs about intelligence, academic efficacy, their achievement goals, their discomfort about differences perceived between parent and school values, their perceptions of their parent's achievement goals, and their parent's beliefs about intelligence and failure?

Given the literature on the development of beliefs about intelligence and the understanding of the complex nature of intelligence (Bempechat et al., 1991; Heyman, Dweck, & Cain, 1992), it is expected that the following variables will yield strong associations: adolescent's perceptions of their parent's failure mindset, perception of their parent's intelligence mindset, and children's own beliefs about failure will be associated with adolescents' perception of their own academic goal orientation, adolescents' discomfort about perceived differences between parent and school values, adolescent academic efficacy, adolescent grades and perceptions of their parents goal orientations. Weak associations are expected to be found

between adolescent's perceptions of their intelligence mindset and their perceptions of their parents' mindset.

Research Question 2. What is the pattern of relationships among variables across grade levels? Are there significant differences between early and late adolescence? Many researchers have found students' perceptions of their parents' goals continue to predict their own achievement goal orientations in middle and high school (Gonida, Kiosseoglou, & Voulala, 2007). Considering literature on developmental trends of achievement goals (Midgley, Maehr, Ghen, Hruda, Marachi, Middleton, & Nelson, 2000; Gonida, et al., 2007) and research demonstrating the alignment of parent performance goals with fixed mindset (Haimovitz and Dweck, 2016), this study aims to explore the relationship between the developmental trends of mindset and goal orientation. The purpose of question two is to address if adolescent perceptions of parent goals and mindsets and student goal orientations and mindsets change from early adolescence to late adolescence.

Research Question 3a. Do performance approach goals, performance avoid goals, perceptions of parent goals, mastery goals (PALS) significantly increase the prediction of GPA over and above control variables (attendance, gender, primary parent, age)?

Research Question 3b. Do adolescent's beliefs about intelligence and their perceptions of their parents' beliefs about intelligence and failure significantly predict GPA over and above PALS variables?

It is expected that adolescent beliefs about intelligence and their perceptions of their parents' beliefs about intelligence and failure will significantly predict GPA. Students' perceptions of their parents' goal structure have been found to significantly predict their own achievement goals from early adolescence (e.g., Friedel, Cortina, Turner, & Midgley, 2010) into

late adolescence (Gonida et al., 2007). Similarly, perceptions of parent fixed mindset have been found to predict fixed mindset in their children (Haimovitz & Dweck, 2016) and fixed mindset has been associated with lower grades (Trzesniewski & Dweck, 2007). Students' possessing performance goal structures and higher fixed mindset are likely to have lower classroom achievement compared to those with mastery goal orientations (Anderman & Midgley, 1997; Anderman & Anderman, 1999; Midgley & Urdan, 2001; Urdan et al., 1998) Previous studies have shown a negative relationship between students' performance goal structures and classroom achievement (Anderman & Midgley, 1997; Anderman & Anderman, 1999; Midgley & Urdan, 2001; Urdan et al., 1998) and a negative relationship between students' fixed mindset and their classroom achievement. Therefore, the third goal of this study is to explore student goal orientations and perceptions of parents' goal orientations as predictors of academic achievement above and beyond that of the control variables (i.e attendance, gender, honors/AP course enrollment), and secondly if student mindset and perceived parent mindset contribute to goal orientation as a predictor of academic outcomes, as measured by ELA and Math Grades. It is expected that adolescent goal orientation, adolescent perceptions of parent goal orientation, dissonance between home and school, and adolescent academic self-efficacy will predict academic achievement above and beyond attendance, honors/AP class enrollment, and parent most involved in school. It is also expected that adolescent intelligence mindset and adolescent perceptions of parent intelligence mindset will significantly predict academic achievement.

CHAPTER III: RESEARCH METHODS

The present study used a quantitative research design to analyze the relationships between adolescents' perceptions of their parents' beliefs about intelligence (intelligence mindset) and failure (failure mindset), their beliefs about intelligence, and their achievement in terms of academic outcomes. The study included the collection and analysis of quantitative data from self-report measures. Perception of Parent Intelligence Mindset Scales (Haimovitz & Dweck, 2016) and Perception of Parent Failure Mindset Scale (Haimovitz & Dweck, 2016) were used to measure adolescents' perceptions of their parents' mindset. Adolescent intelligence mindset was measured using Dweck's (1999) modified growth mindset scale, as used in Haimovitz and Dweck's (2016) study. The Patterns of Adaptive Learning (PALS) measure (Midgley, Maehr, Hruda, et al., 2000) was used to assess the academic related beliefs and achievement goal orientations of adolescents, their perceptions of their parents achievement goal orientations, and the levels of discomfort felt due to perceived differences between parent and school values. Analyses focused on testing the research questions related to the nature of the relationships between adolescent perceptions of parent mindsets (intelligence and failure), and perceptions of parent goal orientations (performance and mastery) and adolescent mindsets (intelligence) , goal orientations (performance and mastery), and academic outcomes (grades).

Participants

The participants were recruited from a rural North Carolina public charter school serving approximately 723 students in grades 6-12. The school serves students from a wide demographic range who have diverse backgrounds including socioeconomic status, abilities and disabilities,

educational needs, family of origin, and grade point averages. The criteria for participant recruitment included (1) students enrolled in a North Carolina public charter school, (2) ages 11-21, and (3) in grades 6-12. The sample of convenience included 145 recruited students, aged 11-18, Mean (μ) age = 14.8, with 42 percent of the sample self-identified as male and 55% as female, 1.4% as transgender, and less than one percent self-identified "preferred not to say". Ethnicity of the participants was unknown, as this question was mistakenly eliminated from the final survey.

Measures

All measures (Perceptions of Parents' Failure Mindset, Perceptions of Parents' Intelligence Mindset, Patterns of Adaptive Learning Scales, and Academic Outcomes) were completed by students using an on-line survey generated using Qualtrics software, Version [April 2019] of Qualtrics, copyright © (2019) Qualtrics. Qualtrics and all other Qualtrics product or service names are registered trademarks or trademarks of Qualtrics, Provo, UT, USA. https://www.qualtrics.com. See Table 3.1 for measurement information on Mindsets and Table 3.2 for measurement information on PALS.

Demographic Information. The demographic survey for adolescents consisted of a set of questions that asked about general information, including dominant parent (i.e. please indicate which parent helps you most with your school work: mom, dad, my parents are not involved), gender ("please choose the gender that you most identify: female, male, transgender, and I prefer not to say"), honors course and/or AP enrollment(yes/no), grade level (6th, 7th 8th, 9th, 10th, 11th 12th), attendance history, and age.

Perceptions of Parents' Failure Mindset (PPFM). The PPFM measure was designed by Haimovitz and Dweck (2016), to assess children's perceptions of their parents' failure

mindset (the belief that failure enhances or debilitates performance/learning). See Table 1. This

Table 3. 1 Measure of Mindset

Measures of Mindset

Measures of Mindset	Constructs	Composite Scores	Validity	Reliability
Implicit Theories of Intelligence (Cain & Dweck, 1995)	Growth vs. Mindset	1-6 1: Growth 6: Fixed	Confirmatory Factor Analysis per (Dweck, Chiu, and Hong, 1995)	$\alpha = .85$ to .94
Perceptions of Parent Intelligence Mindsets (Haimovitz & Dweck, 2016)	Perceptions of Parents Intelligence Mindset Growth vs. Fixed	1-6: 1: Growth 6: Fixed	None Found	$\alpha = .77$
Perceptions of Parents' Failure Mindsets (Haimovitz & Dweck, 2016)	Perceptions of Parents' Failure Mindset Debilitating vs. Enhancing	1-6: 1: Enhancing 6: Debilitating	None Found	$\alpha = .77$

study uses the measures from Haimovitz and Dweck (2016) and the researchers have not yet

validated these questions, but reliability in their study yielded adequate reliability (α=.77)

(Haimovitz & Dweck, 2016). The PPFM is comprised of three items scored on a six-point Likert

scale (1 = "strongly disagree" to 6 = "strongly agree"), indicating their extent of agreement with

the items. A reverse code (i.e., strongly disagree = 6 and strongly agree = 1) is used with

negative statements, "my parents think failure is bad and should be avoided", "my parents think

failure hurts my learning." Consistent with previous methods of scoring growth mindset (Claro,

et al., 2016; Schleider et al., 2016), a total score was calculated by summing the three items. For

the purpose of this study, perception of parent failure mindset was measured using a continuous

variable, where high scores reflected perceptions that one's parent espouses beliefs that failure is

debilitating to the process of learning, and lower scores indicated perceptions that one's parent

believes failure is enhancing to the process of learning (e.g., Dweck & Haimovitz, 2016; Snipes

& Tran, 2017).

Table 3. 2 PALS Measures

PALS Measures

Measures	Constructs	Composite Scores	Validity	Reliability
Patterns of Adaptive Learning (Midgley, et al., 2000)	Personal Achievement Goal Orientations	1-5 1: Not at all true 3: Somewhat True	Confirmatory Factor Analysis GFI= 0.97 AGFII = 0.95	See subscales
	Achievement-Related Beliefs	5: Very True		
	Perceptions of Home and Life			
Subscales				
Personal Achievement Goal Orientation	Mastery Goal Orientation	1-5 1: Not at all true 3: Somewhat		α= .85
	Performance Approach Goal Orientation	True 5: Very True		α= .89
	Performance Avoid Goal Orientation			α= .74
Academic-Related Perceptions, Beliefs, and Strategies	Academic Efficacy	1-5 1: Not at all true 3: Somewhat True 5: Very True		α= .78
Perceptions of Parents, Home Life, and Neighborhood	Perceptions of Parent Performance Goal Orientation	1-5 1: Not at all true 3: Somewhat True		α= .71
	Perceptions of Parent Mastery Goal Orientation	5: Very True		α= .71
	Perceptions of Parent Dissonance			α= .76

Perceptions of Parents' Intelligence Mindset (PPIM). The PPIM measure, developed by Haimovitz and Dweck (2016), is a three-item measure that includes: "my parents think you can learn new things, but you can't change how smart you really are", "my parents think how smart you are is something you can't change very much" on a 6-point Likert scale. See Table 1. Validation studies have not been conducted on this measure, though reliability in Haimovitz and Dweck's (2016) study indicated (α= .77). Reliability tests of the modified Perceptions of Parents

Mindset questions were conducted prior to data analysis, reliability indicated lower reliability (α=.62). For the purpose of this study, a continuous variable was derived in which high scores reflected adolescent perceptions that parents believe intelligence is fixed, and lower scores indicated perceptions that parents believe intelligence can grow (e.g., Haimovitz & Dweck, 2016).

Adolescent Intelligence Mindsets. The Implicit Theories of Intelligence Survey (TOI), developed by Cain and Dweck (1995), is comprised of four questions that assess intelligence mindset (the belief that intelligence can grow or that or that it is fixed), with the word "intelligent" in the adult version changed to "smart" (e.g. Haimovitz & Dweck, 2016). See Table 1. The four questions used in the survey were: "how smart you are is something about you that you can't change very much", "you can learn new things, but you can't change how smart you really are", "you're a certain amount smart, and you can't really do much to change it". High scores on this scale indicate a fixed (entity) mindset on intelligence, while low scores indicate a growth (incremental) mindset on intelligence. Consistent with previous methods of scoring growth mindset (Claro, et al., 2016; Schleider et al., 2016), a total score was calculated by summing the three items. For the purpose of this study, a continuous outcome was used, where high scores reflected stronger beliefs that intelligence is fixed, and lower scores indicated stronger beliefs that one can grow their intelligence (e.g., Claro, et al., 2016; Dweck & Haimovitz, 2016; Snipes & Tran, 2017).

Confirmatory factor analysis, across five validation studies, confirmed theories of intelligence as a separate domain and found it to have high internal reliability (α = .85 to .94) and test re-rest reliability (.80) (Dweck, Chiu, & Hong, 1995). According to Dweck and colleagues (1995) the scale appears unaffected by social desirability, intellectual ability, political beliefs or

self-presentation concerns, indicating good discriminant validity against a range of potentially confounding variables.

Student Achievement Goal Orientations. Previous studies have shown that people who hold beliefs that intelligence can grow are more likely to be motivated by the mastery (understanding) of academic content, than demonstrating their knowledge through performance indicators (i.e. grades or looking smart); while those holding beliefs that intelligence is fixed are more likely to be motivated by indicators of performance than by mastering content learned (understanding of the material). These student achievement goal orientations were measured using three scales taken from the PALS (See Table 2) developed by Midgley et al. (2000) according to the trichotomous theoretical framework (e.g., Middleton & Midgley, 1997). The three scales consist of six items each: a) mastery goal orientation (e.g., "one of my goals in class is to learn as much as I can"), b) performance-approach orientation (e.g., "one of my goals is to look smart in comparison to other students"), and c) performance-avoidance orientation (e.g., "one of my goals is to keep others from thinking I'm not smart in class").

Academic-Related Perceptions, Beliefs, and Strategies. Achievement related beliefs were measured using the Academic Efficacy scale (five items) taken from Academic-Related Perceptions, Beliefs, and Strategies section of the PALS developed by Midgley, et al. (2000). Elevated scores on academic efficacy (e.g., "I'm certain I can figure out how to do the most difficult class work") indicates perceptions of greater competence of students to do their classwork (See Table 2).

Perceptions of Parents. (See Table 2) Three scales taken from the Perceptions of Parents, Home Life, and Neighborhood portion of the PALS (Midgley, et al., 2000) were used to measure perceptions of parent goals and the level of discomfort one feels due to perceptions of

conflict between values of parents and the school culture (dissonance between home and school). The following subscales were used: Parent Mastery Goal Orientation (six items), Parent Performance Goal Orientation (five items) and Perceived Parent Dissonance (five items).

Elevated scores on the parent mastery goal subscale (e.g., "My parents want my work to be challenging for me.") are indicative of adolescent's beliefs that their parent is focused more on mastery learning goals. Elevated scores on the parent performance goal subscale (e.g., "My parents don't like it when I make mistakes in my class work.") indicate students see their parents as being more focused on competence and performance. Elevated scores on the parent dissonance subscale (dissonance between home and school) (e.g., "I don't like to have my parents come to school because their ideas are very different from my teachers' ideas") indicate high level of concern or discomfort of students due to perceptions of conflict between parent and school values. Two of the five questions on the Perceptions of Parent Dissonance were eliminated, for purposes of final analysis, as they did not specifically mention "parent" in the question.

Academic Outcomes. The sum of English Language Arts (ELA) and Math grades were used to measure academic outcomes. These grades were comprised of homework and test scores. Students used their transcripts to enter their grades at the time of administration of the survey.

Procedures

Recruitment and Consent. To protect the rights and privacy of the participants recruited for this research project, several measures were taken to ensure that individuals were informed about their involvement and responsibilities as participants. Before data collection took place, the project was submitted to the University of North Carolina at Chapel Hill Institutional Review Board for approval. The principal and school board administrators supported this research in

their school. This study utilized a sample of convenience, and all students in the school were offered the opportunity to participate. Consent was collected via paper pen method and using Qualtrics, an online data collection service. Consent forms were stored in a secure location on Qualtrics or with the researcher. Consent collection and recruitment occurred in four waves, as described below.

Wave 1. Flyers with information and a link to the survey were given to parents during the last quarterly portfolio review night. Copies of the flyers can be found in Appendix 6. Review of portfolios required students and parents to meet with teachers to review the student's progress and discuss work samples. Teachers passed the flyer on to parents, and parents were able to access consent via their smart devices by typing in a link or scanning the quick response (QR) code. Paper consent forms were also available in the main office. This method yielded 60 parent consents.

Wave 2. A link (see Appendix 7) mirroring the flyer, was posted in the weekly bulletin delivered to parents' email addresses. This method yielded 85 additional parent consents.

Wave 3. Consent was collected via paper pen method while parents waited in the carpool lane. This method yielded 21 additional parent consents. Following wave 3, there was a total of 166 students with permission from their parents to participate in the study.

Wave 4. Wave 4, initiated on the day of survey administration, targeted students ages eighteen and older who were offered participation on the day of survey administration via the survey link.

Survey Administration. The Qualtrics survey was administered during advisory class. Packets with student transcripts, a list of students with consent, and links to the survey were delivered to teachers the evening before the day of the survey administration. The use of smart

devices or school Chromebooks available to all students, were required for students to participate. The survey was accessible via link or QR code.

Students with parent consent were given a copy of their transcript and a link to survey assent. Students over the age of 18 were given a copy of their transcripts and a link to consent. Once students consented or assented, they were automatically directed to a link to the survey. Average time to complete the survey was approximately 11 minutes, ranging between 4.5 minutes to 30 minutes. Survey data was stored in Qualtrics, a password protected on-line assessment tool. No personal identifying information was collected.

Analytic Strategy

Data collected in this study including demographic information and information from the Perceptions of Parents Mindset, Perception of Parent Failure Mindset, and Intelligence Mindset was initially imported into Microsoft Excel, and cleaned. Survey data were then imported into SPSS v.26 (IBM Corp, 2019) and analyzed using descriptive statistics with reliability tests run to ensure internal consistency. Summary scores on the PALS, Perceptions of Parent Intelligence Mindset, Perceptions of Parent Failure Mindset, and Scores of Adolescent Mindset were entered as continuous variables to estimate the strength of relationships addressed in the following research questions.

1: Are there associations among adolescent beliefs about intelligence, academic efficacy, their achievement goals, their discomfort about differences perceived between parent and school values, their perceptions of their parent's achievement goals and their parent's beliefs about intelligence and failure?

2. What is the pattern of relationships among variables across grade levels? Are there significant differences between early and late adolescence?

3a. Do PALS variables (performance approach goals, performance avoid goals,

perceptions of parent goals, mastery goals) significantly increase the prediction of GPA

over and above control variables (attendance, gender, primary parent, age)?

3b. Do adolescent's beliefs about intelligence and their perceptions of their parents'

beliefs about intelligence and failure significantly increase the prediction of GPA over

and above PALS variables?

CHAPTER IV: RESULTS

Preliminary Analyses

Prior to addressing the research questions, descriptive statistics were derived for all study variables as shown in Table 4.1. Modifications were made to several variables for specific analyses. Many variables were collapsed to obtain a more parsimonious and compact summary of the data. ELA and Math grades were averaged to provide an overall Grades score, identified as Grades. Attendance, a categorical variable with five levels to indicate days missed (0= 0 days;

Table 4. 1

Descriptive Statistics of Variables

Variable	Range	Mean	Std. Deviation
Age (years)	11-18	14.79	2.25
Grades (Avg. ELA and Math grades)	0-100%	86.79	8.94
Parent Performance Goal Score	5-25	14.42	4.47
Parent Mastery Goal Score	6-30	21.62	4.76
Parent Dissonance Score	3-15	5.92	2.77
Parent Failure Mindset Score	3-18	8.09	3.56
Parent Intelligence Mindset Score	2-12	5.19	2.16
Academic Efficacy Score	5-25	18.77	4.37
Performance Avoid Goal Score	5-25	11.45	4.43
Performance Approach Goal Score	5- 25	13.18	5.31
Mastery Approach Goal Score	5-25	19.61	4.41
Adolescent Intelligence Mindset Score	4-24	10.22	4.63
	Frequency		
Gender	42% Male, 58% Female	.56	.50
Honors (Enrollment)	52.4%Yes, 47.6% No	.48	.50
Attendance (Days Missed)	42.8% <6 days, 47.6% >6 days	.57	.49
Parent Identified	90.3% Mother, 9.7% Other	.10	.30

Note: Parent = Parent most involved; Honors = Enrolled in honors or Advanced Placement classes;
Grades = Sum of English Language Arts and Math grades
1= 1-2 days, 2 = 3-4 days, 3 = 5-6 days, 4 = more than 6 days) was collapsed into two categories

(missed less than 6 days, missed more than 6 days). Gender was dummy coded to enter in the

regression equation, female, the largest group, was used as the control variable. To answer

research question two, age, a continuous variable was collapsed into two levels (early

adolescence = 0, late adolescence = 1) where ages eleven through fourteen were considered early

adolescence and ages fifteen through eighteen and older were considered late adolescence.

Ninety percent of students identified their mother as being the parent most involved in school,

thus parent most involved in school was collapsed into two variables (mother = 0, other = 1)

where "other" included aunt, grandmother, father, stepmother and other. All variables are

derived from adolescent perceptions, thus parent variables can be defined as "perceptions of

parent".

**Question 1: Are there associations among adolescent beliefs about intelligence,
academic efficacy, their achievement goals, their discomfort about differences perceived
between parent and school values, their perceptions of their parent's achievement goals,
and their parent's beliefs about intelligence and failure?**

The first question was tested by calculating bivariate correlations among study variables

to determine the strength of association between adolescent perceptions of the fixedness of

intelligence, adolescents' perception of their parent's beliefs about intelligence and failure, and

adolescents' grades. The correlation matrix was examined for significant associations (Table

4.2). Cohen's standard was used to evaluate the strength of correlation coefficient, where .10 to

.29 represents a weak association between the two variables, .30 to .49 represents a moderate

association, and 0.50 or larger represents a strong association (Cohen, 1988). A review of the

correlation matrix indicates that students with higher grades were less likely to experience

discomfort due to perceived differences between parent and school values (parent dissonance),

report having higher academic efficacy (beliefs they can do well in school), and to be more

motivated by mastering academic content (mastery goals) over demonstration of academic

competence through performance (performance goals).

Table 4. 2

Bivariate Pearson Correlation Matrix of PALS, Mindset, and Grades

Variable	1	2	3	4	5	6	7	8	9	10	11
Grade											
PFM	-.13										
PIM	-.02	.28**									
PPG	-.12	.50**	.08								
PMG	.12	-.24**	-.21*	.18*							
PD	-.34**	.31**	.16	.34**	-.04						
AE	.28**	-.24**	-.12	-.01	.44**	-.28**					
PAG	.02	.38**	.01	.34**	-.05	.16	-.11				
PApG	.05	.39**	.06	.35**	.01	.08	-.05	.79**			
MAG	.18*	-.26**	-.18*	-.04	.49**	-.33**	.59**	-.02	.05		
AIM	-.13	.25**	.49**	.14	-.14	.39**	-.24**	.22**	.19*	-.31**	
Range	117-200	3-18	2-12	4-24	5-25	9-30	4-20	5-25	5-25	5-23	7-25
Mean	174.04	7.94	5.21	10.15	14.27	21.79	11.44	13.22	19.84	10.13	18.87
SD	16.28	3.45	2.16	4.60	4.41	4.66	4.39	5.27	4.15	4.17	4.24

Note. N = 145; AIM = Adolescent Intelligence Mindset' AE =Academic Efficacy; MAG = Mastery Approach Goals; PD = Parent Dissonance; PFM =Parent Failure Mindset; PIM = Parent Intelligence Mindset; PMG = Parent Mastery Goal ; PPG = Parent Performance Goals; PApG = Performance Approach Goals; PAG = Performance Avoid Goals; * $p <.05$ ** $p<.01$

Students who reported having higher levels of discomfort due to perceived differences

between parent and school values were more likely to believe that intelligence is fixed, be less

motivated by mastery of content learned in school and report having lower academic efficacy.

These students were also likely to perceive their parents to have stronger beliefs that failure is

debilitating and be more focused on their children's performance and demonstration of ability

than on their mastery of content.

Adolescents who reported their parents to believe that failure is more debilitating than

enhancing to the process of learning were likely to report lower academic efficacy, report being more motivated by demonstration of competence through performance and less by mastery of content, have stronger beliefs that intelligence is fixed, and report higher levels of discomfort due to differences between parent and school values.

Overall, the associations of measured variables suggest that adolescents have stronger beliefs that intelligence is fixed tended to endorse being more motivated by demonstrating knowledge and competence through performance and less motivated by mastering content learned in school, while also having less faith in their ability to succeed (academic efficacy).

Question 2. What is the pattern of relationships among variables across grade levels? Are there significant differences between early and late adolescence? In an attempt to align with previous research, grade, instead of age, was used to explore relationships among variables. Pearson correlation coefficients and descriptive statistics for the variables under examination in the seven grade groups are shown in Figure 1 and Table 4.3. It is noted that there were not enough participants in each grade level to establish sufficient power to report significance. Correlations were consistently high across 6th grade. Students in 6th grade were likely to hold beliefs about intelligence that were closely related to the perception of their parent's beliefs about intelligence and failure. Apart from 8th and 12th grade, the relationship between adolescent intelligence mindset and perception of parent intelligence mindset were positively related. No significant associations were found between the beliefs adolescents hold about intelligence and what they perceive their parent to believe about failure, in 7th to 12th grade students, suggesting a developmental shift in beliefs of students after 6th grade. Similarly, no significant associations were found between perception of parent intelligence mindset and perception of parent failure mindset from 7th to 12th grade. Conversely, strong associations were

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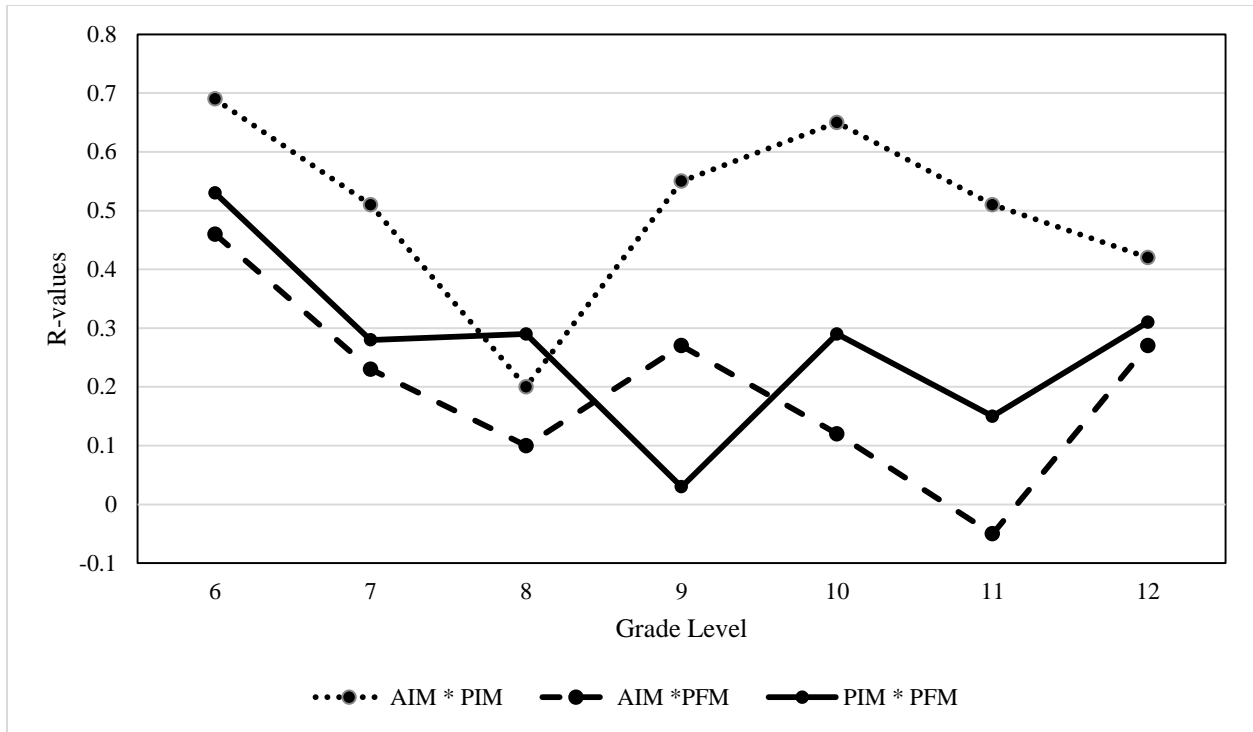
Figure 4. 1. Patterns of Relationships Between Mindset Variables

found between adolescents' beliefs about intelligence and what they perceive their parents to

believe about intelligence in all grades except 8th and 12th, both transitional grades.

Because variables of parent intelligence mindset, parent failure mindset, adolescent

intelligence mindset and grades were not normally distributed, the test for differences between

students in early and late adolescence was performed with the Mann-Whitney *U* test (Table 4.4).

The analysis indicated that adolescent intelligence mindset scores were significantly lower, that

is more growth oriented, in early adolescence (*Mdn*= 8.00, n = 68) than in late adolescence

(*Md*n= 11, *n* = 77), *U* = 1950.0, *z* = -2.66, *p* = .008, with a small effect size *r* = -.22). No other

significant differences were found between early and late stages of adolescence.

Table 4. 3

Pearson Correlations Between Mindset Variables Across Grade Levels

		PFM	PIM	Mean	SD
Grade 6	PFM			7.08	3.33
N = 25	PIM	.53**		4.68	2.51
	AIM	.46**	.69**	9.0	4.90
Grade 7	PFM			8.48	3.50
N = 23	PIM	.28		5.04	2.10
	AIM	.23	.51*	10.04	5.50
Grade 8	PFM			7.67	3.18
N = 15	PIM	.29		5.40	2.44
	AIM	.10	.20	9.47	4.37
Grade 9	PFM			8.33	3.46
N = 18	PIM	.03		5.0	2.20
	AIM	.27	.55*	10.22	4.26
Grade 10	PFM			9.11	3.07
N = 18	PIM	.29		5.22	2.24
	AIM	.12	.64**	10.67	4.26
Grade 11	PFM			8.17	4.17
N = 24	PIM	.15		5.25	1.23
	AIM	-.05	.51*	10.13	3.72
Grade 12	PFM			8.0	3.95
N = 22	PIM	.31		5.86	2.42
	AIM	.27	.42	12.05	4.82

Note. AIM = Adolescent intelligence mindset; PIM = Perception of parent intelligence mindset, PFM = Perception of parent failure mindset
*** p<.01, * p<.05*

Table 4. 4

Mann Whitney U Test: Differences in Early and Late Adolescence

	Early Adolescence	Late Adolescence			
	n = 68	n = 78			
Variable	*Mdn*	*Mdn*	*U*	*z*	*p*
Grades	177.0	178.82	2411	-.82	.41
AIM	8.0	11	1950.0	-2.66	.01*
PFM	7.87	8.29	2812.0	.77	.44
PIM	2.5	2.67	2884.5	1.07	.29

Note. PFM = Parent Failure Mindset; PIM = Perception of Parent Intelligence Mindset; AIM = Adolescent Intelligence Mindset
*p<.05

Question 3a. Do PALS variables (performance approach goals, performance avoid goals, perceptions of parent goals, mastery goals) significantly increase the prediction of GPA over and above control variables (attendance, gender, primary parent, age)?

Hierarchical multiple regression was used to assess the contribution of PALS variables (performance approach goals, performance avoid goals, mastery approach, academic efficacy, parent mastery, parent performance goals, and parent/school dissonance) to predict student grades after controlling for the influence of student variables of attendance (missing more than 5 days), gender (female), enrollment in honors classes (yes, no), and age (11-18). For model 1, a significant regression equation was found (F (5, 139) = 3.84, p = .003), with an adjusted R^2 of .09 (see Table 4.5). Honors, gender (female), parent (mom), age, and attendance explained about 9.0% of the variance in student grades.

The addition of PALS variables (performance approach goals, performance avoid goals, mastery approach, academic efficacy, parent mastery goals, parent performance goals, and parent/school dissonance) in Model 2 , yielded a significant regression model F(11, 133) = 3.67, p = .000, adjusted R^2 of .17. In this model The PALS variables explained an additional 11.1% of the variance in grades, after controlling for gender, attendance, parent, age, and honors. The variables of academic efficacy (β= .22, p = .03) and parent/school dissonance (β= -.22, p = .02) were significant predictors of student grades.

Question 3b. Do adolescent's beliefs about intelligence and their perceptions of their parent's beliefs about intelligence and failure significantly increase the prediction of GPA over and above PALS variables?

The addition of parent intelligence mindset, parent failure mindset, and adolescent intelligence mindset to the equation (see Table 4.5) in the final model did not result in a

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significant change in the amount of variance accounted for in predicting student grades ($F_{(14, 130)} = 2.86$ $p = .001$).

Table 4. 5

Prediction of Sum of Grades

		Model 1 $R^2= .12$ Adjusted $R^2= .09$ $\Delta R^2= .12$			Model 2 $R^2= .23$ Adjusted $R^2= .17$ $\Delta R^2= .11$			Model 3 $R^2= .24$ Adjusted $R^2= .16$ $\Delta R^2= .00$		
Model	Variables	B	β	p	B	β	p	B	B	p
1	Honors	-8.3	-.23	.01*	-5.5	-.15	.07	-5.6	-.16	.07
	Attend	-4.49	-.13	.12	-4.04	-.11	.15	-3.57	-.10	.22
	Gender	5.17	.14	.08	4.33	.12	.15	4.56	.13	.14
	Parent	-6.76	-.11	.17	-6.85	-.11	.15	-6.68	-.11	.17
	Age	-1.17	-.15	.07	-.74	-.09	.27	-.81	-.10	.24
2	PPG				-30	-.08	.43	-.32	-.08	.45
	PMG				.20	.05	.57	.27	.07	.48
	PApG				.30	.09	.28	.30	.09	.32
	MAG				-.37	-.01	.42	-.38	-.10	.41
	PD				-.91	-.22	.02*	-1.49	-.23	.02*
	AE				-1.45	.22	.03*	.89	.22	.03*
3	PFM							.06	.01	.91
	PIM							.62	.08	.43
	AIM							-.07	-.02	.90

Note. PPG =Parent Performance Goals; PMG =Parent Mastery Goal; PApG = Performance Approach Goals; MAG = Mastery Approach Goals; PD = Parent Dissonance; AE =Academic Efficacy; PFM =Parent Failure Mindset; PIM =Parent Intelligence Mindset; AIM = Adolescent Intelligence Mindset

CHAPTER 5: DISCUSSION

The aim of this study was to explore the relationships between adolescent perception of parent mindsets, adolescent characteristics, and academic outcomes. Understanding adolescent perceptions of parents beliefs about intelligence and failure may provide important information about factors that can address current gaps in the literature and expand knowledge on the development of adolescent beliefs and inform possible student and parent intervention. Previous research has demonstrated a relationship between children's intelligence mindset and academic achievement (Blackwell, et al., 2007; Romero, Master, Paunesku, Dweck, & Gross, 2014; Claro, et al., 2016), perceptions of parent's beliefs about intelligence and failure (mindsets) and self-reported beliefs about intelligence (intelligence mindset) (Haimovitz & Dweck, 2016), as well as goal orientations (Gonida, et al., 2007; Friedel, Cortina, Turner, & Midgely, 2010) and self-efficacy (Dweck, 2010). No studies, prior to the current study, however, had examined the perceptions of parent beliefs about intelligence and failure in adolescent populations. The present study was designed to provide a broader understanding about the relationships between adolescent perceptions of parental mindsets, adolescent intelligence mindset and academic performance.

Theories and research on motivation focus on individuals' beliefs, values, and goals as primary influences on motivation (Eccles & Wigfield, 2002). In this study, I examined motivational variables associated with beliefs about intelligence (theories of intelligence) and academic outcomes, in terms of the beliefs of adolescents and their perception of their parent's

beliefs. Findings from this study generally support the motivational framework of intelligence mindset in that adolescents' beliefs about intelligence (growth or fixed minded) is significantly associated with their achievement goals (performance and mastery), and academic self-efficacy (e.g., Dweck & Bempechat, 1983; Dweck & Leggett, 1988; Elliot & Dweck, 1988; Dweck, 2006). Moderate associations were found between intelligence mindset and feelings of discomfort due to differences between parent and school values (parent/school dissonance) and school, a relationship that has yet to be explored.

The results, similar to previous findings (Muenks et al., 2010), indicate moderate associations between adolescent perceptions of their parent beliefs about intelligence and adolescent beliefs about intelligence; and adolescent perception of parent mastery learning orientation, with their own mastery orientation. That is, students who were more fix minded, likely indicated their parents to be more fix minded and less mastery oriented. No associations were found between perceptions of their parent's intelligence beliefs and parent performance orientations. These results are surprising, given evidence that mothers who hold fixed beliefs about intelligence likely exhibit overt, negative, controlling responses to their children's poor performance (e.g., Grolnick et al., 2002, Moorman & Pomerantz, 2010); which presumably are more visible to their children than the autonomy supportive behaviors of parents who emphasize the importance of mastery learning and skill acquisition associated with growth mindset. Similarly, a child's belief that one's parent is more focused on performance mediates the relationship between parent's beliefs about failure and children's beliefs about intelligence (Haimovitz & Dweck, 2016). Results of the current study indicate perceptions of parent failure mindset are associated with all variables, except academic performance (grades). We would expected, then, the relationship between adolescents' beliefs about intelligence and their

perception of their parent's beliefs about intelligence to be more strongly associated with perceived parent performance goals, as these behaviors tend to be more visible than behavior associated with being more growth minded and mastery oriented (i.e. encouragement to persevere, acceptance of failure as a process of learning, and emphasis on effort or hard work over ability). It has been hypothesized that parents who are more focused on mastery tend to be more involved in their children's academic endeavors than parents who are performance oriented. That is, parents who are more mastery oriented likely encourage and facilitate study skills, time management, and emphasize the value of the process of learning, while performance-oriented parents may not emphasize effort or be as involved in helping their children master the process of learning.

Haimovitz and Dweck (2016) found children's perception of performance goal orientation to be a mediator of the effect of parent's own beliefs about failure on their child's beliefs about intelligence. While the relationships between parent beliefs about intelligence and the intelligence beliefs of their children were not explored, findings were similar in that adolescents who viewed their parent to believe failure is debilitating were likely to view their parent as being more focused on performance indicators of success (social comparison, grades), than on their child's mastery and skill acquisition.

Academic efficacy and feelings of dissonance between parent and school values were the only variables associated with academic outcomes (grade average) in the regression, but mastery approach goal orientation was in the correlation matrix. In that students with higher grades tended to endorse having more confidence in their ability to do well in school and experience less discomfort due to differences between parent and school values, compared to those with lower grades.

Further investigation of the relationships between parents' intelligence and failure beliefs, their goal orientations and the behavior associated with parent facilitation of motivation in their children is needed to better understand these relationships. Additionally, research exploring the relationship between discomfort due to perceived differences in values and beliefs between parent and school and parent mindsets may help expand the understanding of how mindsets develop in children and in teenagers.

Developmental Patterns of Relationships

Next, the patterns of relationships were explored between adolescent beliefs about intelligence and their perceptions of their parent's beliefs about intelligence and failure across grade. Previous research, with parents of fourth and fifth grade students, found parent's beliefs about failure to be a stronger predictor, than their beliefs about intelligence, of their children's beliefs about intelligence (Haimovitz & Dweck, 2016). Sixth grade students were the only group to demonstrate strong associations between their parents' beliefs about failure and intelligence and their beliefs about intelligence. These results should be analyzed with caution as there was not enough power to suggest statistical significance. According to Dweck (2002) implicit theories do not form the interconnected network of beliefs until after 10–12 years of age, which may also explain the shift in beliefs after sixth grade. As students leave sixth grade and transition into higher grades, they no longer associate their beliefs about intelligence with their perceptions of their parent's beliefs about failure. They may also have had enough experience in school that promotes the value of learning from one's mistakes and failures. As students reach adolescence parental involvement and influence declines, while peer influence increases. Parents may be more inclined to exhibit autonomy supportive behavior to promote identity development in their children and demonstrate less controlling behavior. Preliminary results indicated adolescent

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beliefs about intelligence are strongly related to those they perceive their parents to have except in transitional grade levels, in this case eighth and twelfth grades. Weaker associations in eighth and twelfth grades may be explained by Marcia's (1966) identity development theory. According to Marcia (1966) adolescence marks a period of identity crises, which children solve by making choices regarding their future in several life domains. Eighth and twelfth grade students are likely faced with these identity crises as they transition from more adult controlling environments in middle (8th grade) and high school (12th grade) to having more freedoms, novel experiences, and responsibilities, in turn entering into a stage of identity exploration and individuation from parents. It is noted that, in our sample, adolescent intelligence mindset scores were lower, that is less fixed, in early adolescence than in late adolescence, but it is impossible to determine statistical significance as there was not enough power to disaggregate by grade. While the current study did not yield sufficient power, previous studies have yielded similar findings (Muenks, et al., 2015).

Do transitional developmental stages moderate the relationship between parent and child intelligence mindset? Is it possible that the fourth and fifth grade students, in Haimovitz and Dweck's (2016) study, were also in a transitional stage, hence the weak relationships between adolescent intelligence mindset and parent intelligence mindset? Research on developmental differences associated between children's perceptions of their parent's beliefs about failure, beliefs about intelligence, and academic achievement is needed to better understand how adolescent development stages moderate or mediate parent influence on intelligence mindset.

Predictors of Academic Outcome

Results did not confirm the overall general research question that perceptions of parent failure or intelligence mindset impact academic outcomes in terms of grades. The findings of the

present study suggest that having a more fixed or more growth mindset does not significantly relate to academic success. This is not surprising considering the inconsistencies in previous research on intelligence mindset as a predictor of academic outcomes. Some studies have found there to be significant relationships between mindset and academic achievement (e.g., Blackwell, et al, 2007; Romero, et al., 2014; Claro, et al., 2016); while others have found no such relationship (e.g., Robins & Pals, 2002; Dupeyrat & Marine, 2005; Sriram, 2013; Li & Bates, 2017). These inconsistencies suggest there may be context specific variables (social desirability, prior knowledge of growth mindset frameworks, cultural differences) acting as mediators or moderators between intelligence mindset and academic achievement. More research is needed to understand the impact of intelligence mindset and parent factors on adolescent academic outcomes.

Similar to previous findings, our results confirmed perceptions of dissonance between parent and school (Arunkumar, et al., 1999; Brown-Wright, et al., 2013) and academic self-efficacy (Multon, Brown, & Lent, 1991; Robbins, Lauver, Le, Davis, Langley, & Carlstrom, 2004) to be significant correlates of student's grades. Perceptions of high degrees of dissonance between home and school have been negatively associated with hopefulness about the future, self-esteem, feelings of academic efficacy, and GPA and positively with anger and self-deprecation (Arunkumar, Midgley, and Urdan, 1999).

The relationship of perceived differences in values between home and school have been linked to ease in transition to middle school (Arunkumar, Midgley, and Urdan, 1999), cheating behavior, and disruptive classroom behavior (Brown-Wright, et al., 2013). However, there have been no studies, to our knowledge, that have explored the relationships between perceived dissonance between parent and school and the mindsets of parents and their children

(intelligence and failure). Future research exploring these relationships may help expand the understanding of how mindsets develop in children and adolescents.

Limitations

The present study has yielded new information about the motivational factors affecting adolescent academic outcomes, but several limitations apply to the findings. First, the population from which the students were recruited may limit generalizability of results. Participants were recruited from a rural charter school and a sample of convenience, limiting the generalizability to the broad population at-large. The small sample-size imposed limitations on the strength of statistical analyses and power needed to determine statistical significance, and results should be interpreted with caution, as the study was exploratory in nature. Further, the rural nature of the charter school meant that students either walked or required their own transportation, differentiating the school from more typical public schools where transportation is provided to students who do not live within walking distance. As such it did not represent a general middle or high school population in which students had parents who could not a) afford private transportation, b) drive them to school and from school, or c) have some type of support to provide transportation. This study also underrepresents students of color and students of lower socioeconomic status (SES), as the school reports 90% of their students are considered Caucasian. Because SES and ethnic background were not included in the survey, we have a limited understanding of the different contextual factors that impact mindset and academic achievement. The limiting factors of unknown race/ethnicity and SES should be kept in mind when interpreting the results, as relationships between motivational factors and adolescent outcomes may be different for students of color and/or students from lower SES. Many of these findings mirror findings in previous studies using more diverse populations, supporting

confidence in the findings of the study.

Next, the current study employed a cross-sectional design, limiting inferences about the development of adolescent perceptions and beliefs. It is likely that students' perceptions change throughout the school year and differ from the beginning to the end. Cross-Sectional design is also limiting in that it does not allow for the ability to infer causation. Longitudinal studies in different contexts combining quantitative with qualitative data from both parents and children as well as of the parent child interaction would further clarify how intelligence and failure beliefs are influenced by the parents and how they change over time. Parent use of academic language, academic behavior practices at home, and differences between family and school contexts should be co-examined as they both influence factors associated with student's motivation.

Additionally, some questions on the survey were worded to elicit thought about students' beliefs and perceptions for the remainder of the school year (e.g., I'm confident I can master the information in class this year) and data were collected at the end of the school year and students were already aware of their performance. It is also noted that two questions in the parent dissonance portion of the survey were eliminated to more closely align with adolescent perceptions of their parents, which could impact the validity of results in terms of home-school dissonance. Analysis was run with all five home-school dissonance questions and with just the three parent specific questions. The elimination of two questions did not significantly change the results, as the relationship between perceived parent dissonance and academic outcomes was significant in both scenarios. Further, the actual timing of the survey administration proved limiting in that the survey was administered in the second to last week of school, students were only given fifteen to twenty minutes to complete the survey, and 13% of the overall participants who gave assent, did not complete the survey. The survey was given within the constraints of

one day, limiting participation to only students who were in attendance that day. Future research that focuses on various collection points throughout the year would be useful to study the developmental trajectory of motivational factors such as mindset, academic self-beliefs, and perceptions of parents and their impact on academic performance.

This study focused on measuring adolescent perceptions of their parent's mindset, with 90% of our sample population identifying their mother as being most involved in their schooling. As such the study did not yield data to explore the relationship between adolescent perceived parent mindset and mindset as reported by parents. Adolescents were the only source of information limiting the scope of research to adolescent perceptions, not on actual behavior associated with their reports. Future research is needed to determine differences between parent endorsed beliefs and adolescent perceptions of parent beliefs as well as differences in beliefs between mothers and fathers. Inconsistencies between the current study with adolescent samples and those of previous studies with elementary aged students (4th and 5th graders) warrants further validity testing to demonstrate robustness across age levels. Qualitative research focusing on interviews of parents and failure language used across different geographical areas of the United States may be useful to identify behaviors and language associated with failure mindset that can be included in a failure mindset measurement.

A final limitation is that the study assessed students' general beliefs about achievement in school rather than mindsets associated with specific subject areas. Children's mindsets, efficacy beliefs, and goal orientation may differ depending on context. Similarly, parent language may differ between academic domains (Dweck, 2006). For example, some parents may hold the belief that their child isn't good in a particular academic subject, increasing the likelihood that they may use overt language that promotes learned helplessness and decreased persistence in their

child (i.e. I'm just not good at math, so why try) (Jose & Bellamy, 2012). Exploring the relationships of adolescent mindset across various academic domains that elicit different levels of perceived difficulty could further advance our understanding about the factors associated with intelligence mindset.

Conclusions

The present study adds two main findings to the literature regarding parental influences on the development of intelligence mindset in adolescents and the potential impact on their academic outcomes. First, the intelligence and failure related beliefs children perceive their parents to have appear to be closely related to their own beliefs about intelligence, academic efficacy, and achievement goal orientation, but as they get older and pursue independence and autonomy in adolescence, the less those children may associate their view of their parent's beliefs about intelligence and failure with their own beliefs about intelligence. Schools should consider this information when planning interventions for parents, as mindset training and coaching may be more efficacious at the elementary and early middle school years when associations between adolescent perceptions of parent's beliefs about intelligence and failure and self-beliefs about intelligence are likely strongest. Future research, with larger populations, is needed to confirm this hypothesis.

Second, and perhaps most importantly, children who perceive their parent to have views and beliefs different than those of their school or teacher, are also likely to have lower academic efficacy, stronger fixed mindset, lower mastery goal orientation, and lower grades. Adolescents who view their parents as having similar views and beliefs as their teachers and their school culture are more likely to have higher grades than those of teens who see their parents as having more incompatible beliefs. Schools may have more of an impact on improving student

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achievement by increasing their efforts to provide inclusive parenting practices, rather than focus on changing students' and parents' beliefs about intelligence. Students who report high levels of home–school dissonance have also been found to report lower levels of future hopefulness, academic efficacy, and self-esteem (Arunkumar et al., 1999). Kumar, (2006) found that students' perceptions of classroom performance goals to be predictive of home–school dissonance, but when teachers' reported mastery goal instructional practices, students reports of home-school dissonance decreased as students made the transition from elementary to middle school. Perhaps a more economical and efficacious approach would be for schools to invest in teacher trainings and coaching that address the positive outcomes of using mastery-goal oriented classroom structure. Future research is needed to assess the value of such practices.

APPENDIX 1: TEACHER FLYER

Dear Teachers,

I am a graduate student in the PhD program at UNC Chapel Hill, and former school psychology extern at Southern Wake Academy. I am conducting research on the development of motivational factors in teens, specifically, growth mindset. Participation is completely voluntary, and you are under no obligation to take part in the study. It is important that you understand that neither you nor your students will be penalized for non-participation. Please notify Miss Jessica Hayden if you do not wish to participate and we will make other arrangements.

Some research has shown that growth mindset has been linked to higher motivation and achievement in middle and high school students. It is my aim to determine beliefs affecting the development of growth mindset in teens. Following the survey administration and data analysis, I will share the results and offer strategies for increasing growth mindset and motivation in your students.

Teachers are being asked to participate in the following activities;

During Portfolio Reviews: You will be asked to send home and give parents a flyer describing the study during portfolios. Please direct any questions to me: jesjess@live.unc.edu

On the day of the survey administration: You will be provided with an envelope with all transcripts of your students, in your advisory class, who have given consent, along with a link to the survey. You will be asked to hand out student transcripts and a flyer with the link to the survey. Students will be asked to complete the (approx.) 20-minute survey in class, using their Chromebook, smart phone, or laptop. Students who do not have consent can work quietly at their desks to complete homework or an assignment of their choice.

At the completion of the survey: students will hand you their transcripts to be returned to the envelope. Envelopes will be collected by a school official at the end of the day and transcripts will be shredded.

Thanks in advance you for your time.

Warmly,
Jessica Hayden, MA, CAS, PhD Candidate
585-734-8933
jesjess@live.unc.edu

APPENDIX 2: PARENT FLYER

Dear Parents:
Your child is invited to participate in an anonymous survey, as a part of a research study, about how the beliefs of teenagers impact their motivation to learn in school. These motivational factors have been linked to increased academic achievement. This research will help us better understand how to provide support and intervention for teens to improve motivation and overall academic success. The general outcome of the study will be shared with the school and parents following data collection and analysis.

You can sign permission electronically or traditional paper-pen:

Electronic:

- Go to https://jesshayden.web.unc.edu/2019/02/**survey/** to electronically sign for consent, a copy of this link is in the on-line weekly bulletin

- Use the QR scanner on your mobile device to go directly to the electronic consent form

Paper:

- Forms are available in the entryways of the school and have also been sent home with students.

FAQs:

What: Your child will be given an anonymous survey about beliefs about learning. No identifying information (name, birthday, etc) will be linked to the survey.

Time: About 10- 20 minutes to complete the survey

When: Your child will take the survey in Advisory in the next few weeks.

What if we don't want to participate: Your child can choose to not participate at any time before or during the survey. They will be asked to quietly complete a school related activity of their choice. You or your child will not be penalized, and their participation will not affect their grade in any way.

Who is Miss Jessica Hayden: Miss Hayden was a student of Dr. Mackey's (our school psychologist) and worked at SWA during the 2016-2017 school year. She is getting her PhD in school psychology at UNC Chapel Hill.

What is she studying: Teenagers beliefs about learning and motivation/drive to learn.
If you have more questions, please contact Miss Jessica Hayden at jesjess@live.unc.edu or (585) 734-8933

Warmly,

Jessica Hayden, MA, CAS

PhD Candidate, University of North Carolina at Chapel Hill

New York State Certified School Psychologist

APPENDIX 3: PARENT CONSENT

University of North Carolina at Chapel Hill
Parental Permission for a Minor Child to Participate in a Research Study

Dear Parent/Guardian,

Your child is invited to participate in a research study about how the beliefs of teenagers impact their motivation to learn in school. These motivational factors have been linked to increased academic achievement. This research will help us better understand how to provide support and intervention for teens to improve motivation and overall academic success.

Concise Summary:
The purpose of this research study is to learn more about teenagers' beliefs about learning. If you give permission for your child to participate, they will be asked to take an anonymous (we don't ask for your name, birthday, or other identifying information) on-line survey (answer questions on-line), in Advisory, that should take about 10-20 minutes to complete. During the survey they will be given a copy of their transcripts (grades) to use for questions about grades. Their transcripts will be shredded once they've used them for the survey. There are no known risks for participating in this survey, and you can always contact the researcher (Ms. Jessica Hayden) if they feel uncomfortable or worried about any of their answers.

If you are interested in learning more about this study, please continue to read below.

What are some general things you should know about research studies?
You are being asked to allow your child to take part in a research study. To join the study is voluntary.

You may decide to not allow your child to participate, or you may withdraw your permission for your child to be in the study, for any reason, without penalty. Even if you give your permission, your child can decide not to be in the study or to leave the study early.

Research studies are designed to obtain new knowledge. This new information may help people in the future. Your child may not receive any direct benefit from being in the research study. There also may be risks to being in research studies. Deciding not to be in the study or leaving the study before it is done will not affect your or your child's relationship with the researcher, the health care provider, or the University of North Carolina-Chapel Hill. If your child is a patient with an illness, your child does not have to be in the research study in order to receive health care.

Details about this study are discussed below. It is important that you and your child understand this information so that you and your child can make an informed choice about being in this research study.

You will be given a copy of this consent form. You and your child should ask the researchers named above, or staff members who may assist them, any questions you have about this study at any time.

What is the purpose of this study?

The Purpose of this study is to learn about how teenagers' beliefs about learning and motivation (reasons for doing something) develop. Your child is being asked to participate in this study because Southern Wake Academy is a unique school that serves students in grades six through twelve, allowing for a wider range of ages.

How many people will take part in this study?

All students at Southern Wake Academy are invited to take part in this study, approximately 500 students.

How long will your part in this study last?

This study should take approximately ten to twenty minutes to complete.

What will happen if you take part in the study?

During this study, your child will be asked to take a survey (answer questions on-line). All surveys are anonymous. This means we will not ask you to tell us your child's name or any other identifying personal information such as your address, parent's name, birthday, etc), and your child's answers will not be linked to their name in any way.

We will be asking about their grades this year and last year, and their teacher will give them their transcripts (grades) so they can answer those questions. When they're done with the survey their teacher will take their transcripts and they will be shredded. Your child and their teachers will be the only people who will see their transcripts. Your child will be the only one who knows how they answered the questions, and their responses will be stored on a password protected data collection site, that only the researchers can see.

What are the possible benefits from being in this study?

Research is designed to benefit society by gaining new knowledge. There is little chance you or your child will benefit from being in this research study.

What are the possible risks or discomforts involved from being in this study?

There are no known risks to participation, but if you feel concerned about your answers or questions being asked, or experience any other problems associated with this study, you should contact the researcher, Miss Jessica Hayden. Every effort will be made to keep your information confidential; however, this cannot be guaranteed. You and your child will not receive compensation (gifts, prizes, or money) for participation in this study.

How will information about you be protected?

Participants will not be identified in any report or publication about this study. We may use de-identified data from this study in future research without additional consent. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety.

Who should you ask if you have any other questions?

You and your child have the right to ask, and have answered, any questions you may have about

this research. If you have questions about the study, complaints, concerns, or if a research-related injury occurs, you should contact the researchers listed on the first page of this form. If you have questions you can call Jessica Hayden (585) 734-8933. If you have other questions, complaints or concerns about your rights while you are in this research study you may contact the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

Parents Agreement

I have read the information provided above. I have asked all the questions I have at this time.

_____I voluntarily give permission to allow my child to participate in this research study.

_____   Grade:
Printed Name of Research Participant (child)

_____   _____
Signature of Parent   Date

_____

Printed Name of Parent

University of North Carolina at Chapel Hill   **IRB Study #18-2301**
Title of Study: Development of Growth Mindset in Adolescence   Consent V. 10/9/2018

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University of North Carolina at Chapel Hill
Assent to Participate in a Research Study
Minor Subjects (7-11 yrs)
Title of Study: Development of Growth Mindset in Adolescence
Person in charge of study: Jessica Hayden
Where they work at UNC-Chapel Hill: School of Education Deans Office
Other people working on this study: Dr. Rune Simeonsson & Dr. Marisa Marraccini

University of North Carolina at Chapel Hill
Consent to Participate in a Research Study

The people named above are doing a research study on beliefs about learning. If you want, you can be a part of this research study.

Concise Summary:
The purpose of this research study is to learn more about teenagers' beliefs about learning. If you choose to participate you will be asked to take an anonymous (we don't ask for your name, birthday, or other identifying information) on-line survey (answer questions on-line), in Advisory, that should take about 10-20 minutes to complete. During the survey you will be given a copy of your transcripts (grades) to use for questions about grades. Your transcripts will be shredded once you've used them for the survey. There are no known risks for participating in this survey, and you can always contact the researcher (Ms. Jessica Hayden) if you feel uncomfortable or worried about any of your answers.

If you are interested in learning more about this study, please continue to read below.

What are some general things you should know about research studies?
You are being asked to take part in a research study. You do not have to be in this study if you don't want to. To join the study is voluntary. You may choose not to participate, or you may withdraw your consent to be in the study, for any reason, without penalty. If you decide to stop, no one will be angry or upset with you, and your grades will not be affected.

Research studies are designed to obtain new knowledge. This new information may help people in the future. You may not receive any direct benefit from being in the research study. There also may be risks to being in research studies. Deciding not to be in the study or leaving the study before it is done will not affect your relationship with the researcher or your teacher.

Details about this study are discussed below. It is important that you understand this information so that you can make an informed choice about being in this research study. You will be given a copy of this assent form. You should ask the researchers named above, or staff members who may assist them, any questions you have about this study at any time.

What is the purpose of this study?
The Purpose of this study is to learn about how teenagers' beliefs about learning and motivation (reasons for doing something) develop. You are being asked to participate in this study because you are a teenager and Southern Wake Academy is a unique school that serves students in grades six through twelve.

How many people will take part in this study?
All students at Southern Wake Academy are invited to take part in this study, which is approximately 500 students.

How long will your part in this study last?
This study should take approximately ten to twenty minutes to complete.

What will happen if you take part in the study?
During this study, you will be asked to take a survey (answer questions on-line). The survey should take no more than about 10-20 minutes. All surveys are anonymous. This means we will not ask you to tell us your name or any other identifying personal information such as your address, parent's name, birthday, etc), and your answers will not be linked to your name in any way.

We will be asking about your grades this year and last year, but your teacher will give you your transcripts (grades) so you can answer those questions. When you're done with the survey your teacher will take your transcripts and they will be shredded. You and your teachers will be the only people who will see your transcripts. You will be the only one who knows how you answered the questions, and your responses will be stored on a password protected data collection site, that only the researchers can see.

What are the possible benefits from being in this study?
Research is designed to benefit society by gaining new knowledge. There is little chance you will benefit from being in this research study.

What are the possible risks or discomforts involved from being in this study?
There are no known risks to participation, but if you feel concerned about your answers or questions being asked, or experience any other problems associated with this study, you should contact the researcher, Miss Jessica Hayden. Every effort will be made to keep your information confidential; however, this cannot be guaranteed. You will not receive compensation (gifts, prizes, or money) for participation in this study.

How will information about you be protected?
Participants will not be identified in any report or publication about this study. We may use de-identified data from this study in future research without additional consent. Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety.

What if you have questions about this study?
You have the right to ask, and have answered, any questions you may have about this research. If you have questions about the study (including payments), complaints, concerns, or if a research-related injury occurs, you should contact the researchers listed on the first page of this form.

What if you have questions about your rights as a research participant?
All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research subject, or if you would like to obtain information or offer input, you may contact the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

Who should you ask if you have any other questions?
If you have questions you can call Jessica Hayden (585) 734-8933. If you have other questions, complaints or concerns about your rights while you are in this research study you may contact the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

Participant's Agreement:

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily agree to participate in this research study.

<u>Participant's Agreement:</u>

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily agree to participate in this research study.

- o Yes
- o No

APPENDIX 5: ASSENT (AGES 7-11)

University of North Carolina at Chapel Hill
Assent to Participate in a Research Study
Minor Subjects (7-11 yrs)
Title of Study: Development of Growth Mindset in Adolescence
Person in charge of study: Jessica Hayden
Where they work at UNC-Chapel Hill: School of Education Deans Office
Other people working on this study: Dr. Rune Simeonsson & Dr. Marisa Marraccini

The people named above are doing a research study on beliefs about learning. If you want, you can be a part of this research study.

Concise Summary:
The purpose of this research study is to learn more about teenagers' beliefs about learning. If you choose to participate you will be asked to take an anonymous (we don't ask for your name, birthday, or other identifying information) on-line survey (answer questions on-line), in Advisory, that should take about 10-20 minutes to complete. During the survey you will be given a copy of your transcripts (grades) to use for questions about grades. Your transcripts will be shredded once you've used them for the survey. There are no known risks for participating in this survey, and you can always contact the researcher (Ms. Jessica Hayden) if you feel uncomfortable or worried about any of your answers. If you are interested in learning more about this study, please continue to read below.

What are some general things you should know about research studies?
You are being asked to take part in a research study. Your parent, or guardian, needs to give permission for you to be in this study. You do not have to be in this study if you don't want to, even if your parent has already given permission. To join the study is voluntary. You may choose not to participate, or you may withdraw your consent to be in the study, for any reason, without penalty. If you decide to stop, no one will be angry or upset with you, and your grades will not be affected.

Research studies are designed to obtain new knowledge. This new information may help people in the future. You may not receive any direct benefit from being in the research study. There also may be risks to being in research studies. Deciding not to be in the study or leaving the study before it is done will not affect your relationship with the researcher or your teacher.

Details about this study are discussed below. It is important that you understand this information so that you can make an informed choice about being in this research study. You will be given a copy of this assent form. You should ask the researchers named above, or staff members who may assist them, any questions you have about this study at any time.

What is the purpose of this study?
The Purpose of this study is to learn about how teenagers' beliefs about learning and motivation (reasons for doing something) develop. You are being asked to participate in this study because you are a teenager and Southern Wake Academy is a unique school that serves students in grades six through twelve.

How many people will take part in this study?
All students at Southern Wake Academy are invited to take part in this study, which is approximately 500 students.

How long will your part in this study last?
This study should take approximately ten to twenty minutes to complete.

What will happen if you take part in the study?
During this study, you will be asked to take a survey (answer questions on-line). All surveys are anonymous. This means we will not ask you to tell us your name or any other identifying personal information such as your address, parent's name, birthday, etc), and your answers will not be linked to your name in any way.

We will be asking about your grades this year and last year, but your teacher will give you your transcripts (grades) so you can answer those questions. When you're done with the survey your teacher will take your transcripts and they will be shredded. You and your teachers will be the only people who will see your transcripts. You will be the only one who knows how you answered the questions, and your responses will be stored on a password protected data collection site, that only the researchers can see.

What are the possible benefits from being in this study?
Research is designed to benefit society by gaining new knowledge. There is little chance you will benefit from being in this research study.

What are the possible risks or discomforts involved from being in this study?
There are no known risks to participation, but if you feel concerned about your answers or questions being asked, or experience any other problems associated with this study, you should contact the researcher, Miss Jessica Hayden. Every effort will be made to keep your information confidential; however, this cannot be guaranteed. You will not receive compensation (gifts, prizes, or money) for participation in this study.

How will information about you be protected?
Participants will not be identified in any report or publication about this study. We may use de-identified data from this study in future research without additional consent.

Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety.

What if you have questions about your rights as a research participant?
All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research subject, or if you would like to obtain information or offer input, you may contact the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

Who should you ask if you have any other questions?
If you have questions you can call Jessica Hayden (585) 734-8933. If you have other questions, complaints or concerns about your rights while you are in this research study you may contact the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

Participant's Agreement:

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily agree to participate in this research study.
I agree to take part in the study:
- o Yes
- o NO

University of North Carolina at Chapel Hill   **IRB Study #18-2301**
Title of Study: Development of Growth Mindset in Adolescence   Consent V. 10/9/2018

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University of North Carolina at Chapel Hill
Assent to Participate in a Research Study
Minor Subjects (7-11 yrs)
Title of Study: Development of Growth Mindset in Adolescence
Person in charge of study: Jessica Hayden
Where they work at UNC-Chapel Hill: School of Education Deans Office
Other people working on this study: Dr. Rune Simeonsson & Dr. Marisa Marraccini

The people named above are doing a research study on beliefs about learning. If you want, you can be a part of this research study.

Concise Summary:

The purpose of this research study is to learn more about teenagers' beliefs about learning. If you choose to participate you will be asked to take an anonymous (we don't ask for your name, birthday, or other identifying information) on-line survey (answer questions on-line), in Advisory, that should take about 10-20 minutes to complete. During the survey you will be given a copy of your transcripts (grades) to use for questions about grades. Your transcripts will be shredded once you've used them for the survey. There are no known risks for participating in this survey, and you can always contact the researcher (Ms. Jessica Hayden) if you feel uncomfortable or worried about any of your answers. If you are interested in learning more about this study, please continue to read below.

What are some general things you should know about research studies?

You are being asked to take part in a research study. Your parent, or guardian, needs to give permission for you to be in this study. You do not have to be in this study if you don't want to, even if your parent has already given permission. To join the study is voluntary. You may choose not to participate, or you may withdraw your consent to be in the study, for any reason, without penalty. If you decide to stop, no one will be angry or upset with you, and your grades will not be affected.

Research studies are designed to obtain new knowledge. This new information may help people in the future. You may not receive any direct benefit from being in the research study. There also may be risks to being in research studies. Deciding not to be in the study or leaving the study before it is done will not affect your relationship with the researcher or your teacher.

Details about this study are discussed below. It is important that you understand this information so that you can make an informed choice about being in this research study. You will be given a copy of this assent form. You should ask the researchers named above, or staff members who may assist them, any questions you have about this study at any time.

What is the purpose of this study?

The Purpose of this study is to learn about how teenagers' beliefs about learning and motivation (reasons for doing something) develop. You are being asked to participate in this study because you are a teenager and Southern Wake Academy is a unique school that serves students in grades six through twelve.

How many people will take part in this study?

All students at Southern Wake Academy are invited to take part in this study, which is approximately 500 students.

How long will your part in this study last?

This study should take approximately ten to twenty minutes to complete.

What will happen if you take part in the study?
During this study, you will be asked to take a survey (answer questions on-line). All surveys are anonymous. This means we will not ask you to tell us your name or any other identifying personal information such as your address, parent's name, birthday, etc), and your answers will not be linked to your name in any way.

We will be asking about your grades this year and last year, but your teacher will give you your transcripts (grades) so you can answer those questions. When you're done with the survey your teacher will take your transcripts and they will be shredded. You and your teachers will be the only people who will see your transcripts. You will be the only one who knows how you answered the questions, and your responses will be stored on a password protected data collection site, that only the researchers can see.

What are the possible benefits from being in this study?
Research is designed to benefit society by gaining new knowledge. There is little chance you will benefit from being in this research study.

What are the possible risks or discomforts involved from being in this study?
There are no known risks to participation, but if you feel concerned about your answers or questions being asked, or experience any other problems associated with this study, you should contact the researcher, Miss Jessica Hayden. Every effort will be made to keep your information confidential; however, this cannot be guaranteed. You will not receive compensation (gifts, prizes, or money) for participation in this study.

How will information about you be protected?
Participants will not be identified in any report or publication about this study. We may use de-identified data from this study in future research without additional consent.

Although every effort will be made to keep research records private, there may be times when federal or state law requires the disclosure of such records, including personal information. This is very unlikely, but if disclosure is ever required, UNC-Chapel Hill will take steps allowable by law to protect the privacy of personal information. In some cases, your information in this research study could be reviewed by representatives of the University, research sponsors, or government agencies (for example, the FDA) for purposes such as quality control or safety.

What if you have questions about your rights as a research participant?
All research on human volunteers is reviewed by a committee that works to protect your rights and welfare. If you have questions or concerns about your rights as a research subject, or if you would like to obtain information or offer input, you may contact the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

Who should you ask if you have any other questions?
If you have questions you can call Jessica Hayden (585) 734-8933. If you have other questions, complaints or concerns about your rights while you are in this research study you may contact the Institutional Review Board at 919-966-3113 or by email to IRB_subjects@unc.edu.

Participant's Agreement:

I have read the information provided above. I have asked all the questions I have at this time. I voluntarily agree to participate in this research study.
I agree to take part in the study:
- o   Yes
- o   NO

APPENDIX 7: STUDENT SURVEY LINK

Dear Student,

You are being asked to take part in a research study about teenagers and learning in school. If you are under 18 your parent has already given permission. It is important that you know that this study is completely voluntary, and you do not have to participate if you don't want to. Your participation will not impact your grades either way. The survey is completely anonymous (you don't tell us your name) and there will be no way to link your name or other information with your answers.

Please scan this QR code or go to the link to take the survey.

https://jesshayden.web.unc.edu/swa/

APPENDIX 8: ACADEMIC BELIEFS ABOUT LEARNING SURVEY

This survey asks questions about beliefs you may have about school and your family members. This information may be used to help us learn more about teenagers and their attitudes and beliefs about school related topics. Your individual answers will be anonymous and confidential and will not be shared with anyone at home or at school. You can stop taking this survey at any time, and Dr. Mackey (school psychologist) will be available if you have questions or concerns about the survey.

Q2 **What grade are you in?**

○ 6th	○ 7th	○ 8th	○ 9th	○ 10th	○ 11th	○ 12th

Q3 What gender do you identify with?

○ Female	○ Male	○ Transgender	○ Choose Not to Say

Q23 What is your most recent ELA grade (see grades/transcript)?

_____

Q4 What is your most recent Math grade (see grades/transcript)?

_____

Q23 I am enrolled in honors and/or AP courses

○ Yes	○ No

Q6 So far, this school year (2018-2019) I have been absent from school:

○ I haven't missed any days

○ 1-2 days

○ 3-4 days

○ 5-6 days

○ 6 or more days

Q7 Many teenagers have one adult in their life who is most involved in school, goes to meetings, talks to teachers. Please tell us who in your family, you feel is most involved in your schooling: (i.e. mom, dad, stepmom, aunt, grandpa)

o Mom	o Dad	o Grandma	o Grandpa	o Aunt	o Uncle
o Stepmom	o Stepdad	o Foster Parent	o Someone Else		

Below are examples of things students <u>sometimes feel</u> about their parents and school. Answer the following questions based on <u>how you think your parent thinks.</u> Please be very honest and tell us how true each of these is for you. No one at home or school will ever see your answers.

Mark your answer below based on the adult you identified as being most involved in your schooling.

Please circle the answer below based on the adult you identified above.
For example; if you identified your mom as being most involved in your education, you would read question:

My mom doesn't like it when I make mistakes in my class work.

1. My parent doesn't like it when I make mistakes in my class work.

	1	**2**	**3**	**4**	**5**
	NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

2. My parent wants me to spend time thinking about concepts.

	1	**2**	**3**	**4**	**5**
	NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

3. I don't like to have my parent come to school because their ideas are very different from my teachers' ideas.

	1	**2**	**3**	**4**	**5**
	NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

4. My parent would like it if I could show that I'm better at class work than other students in my class.

	1	**2**	**3**	**4**	**5**
	NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

5. My parent want my work to be challenging for me.

	1	**2**	**3**	**4**	**5**
	NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

6. I feel uncomfortable when my parent comes to school, because they are different from the parents of many of my classmates.

	1	**2**	**3**	**4**	**5**
	NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

7. My parent would like me to show others that I am good at class work.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

8. I feel troubled because my home life and my school life are like two different worlds.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

9. My parent wants me to understand my class work, not just memorize how to do it.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

10. I am not comfortable talking to many of my classmates because my family is very different from theirs.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

11. My parent thinks getting the right answers in class is very important.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

12. My parent would like me to do challenging class work, even if I make mistakes.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

13. I feel upset because my teacher and my parent have different ideas about what I should learn in school.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

14. My parent wants me to see how my class work relates to things outside of school.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

15. My parent would be pleased if I could show that class work is easy for me.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

16. My parent wants me to understand concepts, not just do the work.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

17. My parent thinks failure is bad and should be avoided.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

18. My parent thinks you can learn new things, but you can't change how smart you really are.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

19. My parent thinks failure hurts my learning.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

20. My parents thinks you can always change how smart you really are.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

21. My parent thinks failure can help me learn.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

----

Here are some questions based on YOU, as a student.
On a scale of 1-5, 1: Not at All True and 5: Very True.
Please mark the number that best describes you.

1. I'm certain I can master the skills taught in school this year.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

2. It's important to me that I don't look stupid in class.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

4. It's important to me that other students in my class think I am good at my class work.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

5. It's important to me that I learn a lot of new concepts this year.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

6. I'm certain I can figure out how to do the most difficult class work.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

8. One of my goals in class is to learn as much as I can.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

9. One of my goals is to show others that I'm good at my class work.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

11. One of my goals is to master a lot of new skills this year.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

13. One of my goals is to keep others from thinking I'm not smart in class.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

14. It's important to me that I thoroughly understand my class work.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

16. One of my goals is to show others that class work is easy for me.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

17. I can do almost all the work in school if I don't give up.

1	2	3	4	5
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

18. One of my goals in school is to avoid looking like I have trouble doing the work.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

19. It's important to me that my teacher doesn't think that I know less than others in class.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

20. Even if the work is hard, I can learn it.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

21. One of my goals is to look smart in comparison to the other students in my class.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

23. It's important to me that I look smart compared to others in my class.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

24. I can do even the hardest work in this school if I try.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

25. It's important to me that I improve my skills this year.

1	**2**	**3**	**4**	**5**
NOT AT ALL TRUE		SOMEWHAT TRUE		VERY TRUE

26. How smart you are is something about you that you can't change very much.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

27. You can learn new things, but you can't change how smart you really are.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

28. You can always change how smart you are.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

29. You're a certain amount of smart, you can't really do much to change it.

1	2	3	4	5	6
Strongly Agree	Agree	Somewhat Agree	Somewhat Disagree	Disagree	Strongly Disagree

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