REACHING TOWARDS RESILIENCE: SCHOOL MOTIVATION MODERATES THE RELATION BETWEEN PROBLEMATIC PARENTING AND ADOLESCENT EXTERNALIZING BEHAVIORS

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ABSTRACT

Fundamental adaptive systems such as achievement motivation have been identified as key mechanisms for affecting youth outcomes. These systems can be encouraged and supported in specific contexts, such as the school setting. This study explored whether school achievement motivation during mid-adolescence could protect against developing externalizing behaviors related to lax, psychologically controlling, or rejecting parenting experienced prior, in pre-adolescence. Motivation was defined and assessed according to adolescent behaviors displayed in the classroom. Data from the Center for Education and Drug Abuse Research (CEDAR) were obtained to carry out the study analyses. The total sample was 775 youth (M = 10.95 ± 0.88 years old; 69% male; 76% Caucasian, 21% African American, 3% multiracial at T1), though sample sizes on key variables where as low as 337 because of missing data. Analyses controlled for father lifetime psychiatric and substance use disorder diagnosis, family socio-economic status, adolescent school learning at T2, adolescent age and sex. Results showed that psychological and emotional forms of problematic parenting in pre-adolescence were associated with future externalizing problems in mid-adolescence, however behavioral forms of problematic parenting did not show any effect. When school motivation was high, adolescents showed the lowest levels of externalizing behaviors related to both psychologically controlling and rejecting parenting, followed by their moderate and low motivation peers. In most cases, only adolescents low in school motivation were significantly impacted by problematic parenting whereas adolescents moderate or high in motivation were not affected. Unexpected nuances in findings are also discussed.

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INTRODUCTION

Across childhood and adolescence, we are susceptible to behavioral challenges that are historically associated with our rearing (Masten, 1999; Siley & Maten 2005). These challenges have the potential to impede healthy development and adaptation, such as the meeting of important milestones during sensitive periods of development and the building of secure attachments. Further, these risks often bring with them cascading features such that struggles in one area of development spread to other areas (Masten, Herbers, Cutuli & Lafavor, 2008). For example, youth externalizing behaviors often also confer risk for academic and social difficulties. Despite the potential for common poor sequelae resulting from similar forms of harmful parenting, we instead find considerable variability in individual outcomes, with resilience, though not uncommon, seeming to be reached in some cases but in not others (for a review see Haskett, Nears, Ward & McPherson, 2006) Though we cannot study the phenomenon of resilience directly, this heterogeneity with regard to youth outcomes renders diligent study of correlates of resilience (protective factors) all the more critical. This study attempts to do just that.

Researchers evaluate risks to normative development given the statistical relation of certain conditions or experiences to poor outcomes involving socio-emotional, psychopathological, competence, or adjustment problems (Kraimer et al., 1997; Masten, 2001; Masten & Barnes, 2018; Masten & Garmezy, 1985). Resilience has been conceptualized as the absence of negative outcomes (e.g., Masten, 2001; Masten, 2014; Narayan, Rivera, Bernstein, Harris, & Lieberman, 2017; Sanders, Munford, & Liebenberg, 2017) or the presence of positive adjustment, in the face of risks (e.g., Mastoras, Saklofske, Schwean, & Climie, 2015; Oshri,

Topple, & Calson, 2017). Even without universal agreement regarding the operationalization of resilience, we observe across studies utilizing different methods and standards, overwhelming commonality in its correlates (see Luthar, Cichetti, & Becker, 2000, for a review; Masten, 2014).

Adversity is first and foremost an individual, biopsychosocial experience that can be acute or chronic. Siley & Masten (2005) broadly define adversity as an experience or circumstance that has the potential to result in a negative outcome by disrupting normal functioning. In order to effectively conceptualize adversity and resilience as part of a larger developmental system, it is helpful to imagine a spectrum. One end of this spectrum identifies a risk and the other reflects an asset that can attenuate that risk (Masten, 2001; Masten & Motti-Stefanidi, 2009). For example, children who experience psychologically controlling parenting at home (a risk) often are susceptible to poor behavioral outcomes in the future, especially during adolescence. However, some children may acquire an achievement orientation (an asset) that is adaptive within the school context, along with other elements of this context such as relationships with reliable and supportive adults (more assets). These gained assets are associated with positive developmental outcomes and reduced risk for poor behavioral outcomes typically associated with poor parenting. Resilience processes may manifest as adaptive school functioning for these youth (goal-setting, educational achievement, good behavior, etc.) and reduced risk for maladaptive school behaviors related to their rearing (Masten, 1999; 2001).

Fundamental adaptive mechanisms have become a focus for researchers working to understand how resilience manifests in some children and adolescents whose life circumstances or conditions increase their susceptibility to developmental, behavioral, and mental health risks (Masten, 2008; Masten & Motti-Stefanidi, 2009). Harnessing the power of adaptive systems to protect at-risk youth is known as a process-focused or adaptive-system-focused approach for

promoting resilience (Masten, 2008; 2014; 2015). Working adaptive systems are essential to our survival, but in adverse conditions may exceed their basic adjustment-facilitative function and act as mitigating or protective mechanisms against perceived threats (Masten, 2014). These systems are vast and extend beyond the individual, to include the family, attachment relationships, extra familial relationships, neuro-cognitive learning and control systems, culture, education systems, communities, and motivation and reward- systems (Baker, Bridger, Terry & Winsor; 1997; Masten, 2014; Patrick, Skinner & Connell, 1993; Weiner, 1985). Among these systems, the motivation to persevere in the face of challenge may be the most essential for the development of resilience in humans (Masten, Herbers, Cutuli, & Lafavor, 2008).

This study explores the role of a basic adaptive mechanism, connected to cognitive reward-systems, in mitigating the influence of parenting features that can impair adolescent behavioral wellbeing. Specifically, I examine the behaviorally protective role of school achievement motivation for adolescents who have reported experiencing parenting that is lax, psychologically controlling or rejecting in pre-adolescence. These features of parenting put adolescents at elevated risk for developing externalizing behavior problems, but the motivation to achieve in school potentially buffers these effects. This topic is important given increasing socio-emotional risks faced by adolescents at home and among peers that can impede healthy development, and moreover, the greater plasticity of the brain and cognitive rewards that can be gained during this sensitive period. During adolescence, feelings of motivation and parallel activation of reward systems in the school-achievement context may lay the groundwork for resilience (Barber, 1996; Fletcher, Steinberg, & Williams-Wheeler, 2004; Masten, 2014; Steinberg, 1990). Just as the spreading activation of risk has been observed, so too might be the case with assets to counter these risks, such that school motivation will extend to positively

influence adolescent behaviors (e.g., Chen, Gully, & Eden, 2001; Pulford, Johnson, & Awaida, 2005).

Basis for the current study

Adolescents who experience parenting that is characterized as rejecting, psychologically controlling or lax are notably at high risk for developing externalizing behavior problems (Lansford, Criss, Pettit, Dodge, & Bates, 2003; McKee, Colletti, Rakow, Jones, & Forehand, 2008; Querido, 2002; Shi & Xie, 2011; Thompson, 2003). Below I detail the theoretical and practical rationales for completing this initial assessment of how mastery adaptive mechanisms such as motivation, particularly in the school context, can protect adolescents who are at-risk for maladaptive behaviors related to their parenting.

Previous research has shown that when looking among environmental and individual protective factors during experiences of significant life adversity, two robust components emerge which predict resilience: mastery and supportive social networks (Masten, 2014; Ryff & Singer, 1996; Sagone & De Caroli, 2014; Rusch, Schvil, Szanton, Neria, & Gill, 2015). This previous research offers potential insight into why the school context may be ideal for studying resilience correlates for youth. School encourages and rewards a goal orientation in individuals while at the same time providing a support system for the attainment of these goals (Pianta, 1998; Pianta, Nimetz & Bennett, 1997; Robinson, 1995). Social support provides an opportunity for encouragement and morale. This encouragement and support may be especially critical for adolescents experiencing problematic parenting at home, since they are less likely to receive effective support at home. Within a supportive school context, mastery can be exerted, felt, and reinforced.

In late adolescence, environmental mastery has been observed to uniquely predict resilience in the form of psychological wellbeing when included with autonomy, life purpose, self-acceptance, and personal growth (Ryff & Singer, 2008). This mastery is related to personal cognitive control or executive functioning, and in typical adolescent development continues to expand into adulthood (Diamond, 2013; Luna et al., 2015). A sense of personal control in the school context is at the center of an adaptive achievement orientation (Harter & Connell, 1984). So much so that uncertain control has been negatively correlated with mastery orientation, motivation and achievement (Connell, 1984; 1985).

Achievement motivation can help adolescents experience the crucial cognitive rewards of goal-reaching and achieving. Further, the motivation to achieve can also open the developmental doors to discovering interests and talents, experiencing supportive and competent adult and peer relationships, modeling effective problem-solving and prosocial behaviors, and engaging in systems of care and community (Masten, 2014). In the school context, this system has great potential to be engaged outside of the home environment that may create challenges for youth wellbeing in the first place (Masten, Herbers, Cutuli, & Lafavor, 2008). Indeed, the school context is the prime socio-cultural setting where achievement can be sought after and demonstrated (Masten, Herbers, Cutuli, & Lafavor, 2008) and where adolescents spend over 1,700 hours a year. Pianta and Walsh (1998) have observed that schools are the "great equalizer" in the United States, providing a safe haven and "way out" for struggling youth facing environmental and economic adversity. School in this way presents an immense opportunity for engaging those youth who may not be supported or encouraged to set and reach goals at home. It is an existing, institutional buffer between the risk of problematic parenting and the asset of a caring system of reliable adults and peers.

By engaging the motivation system in school, teachers and other reliable adults help youth to value learning, which in turn can promote a sense of agency and, in a feedback loop, enhance motivation (Masten, 2009). The school context can provide structure and support and instill goals within students to achieve academically (Barrett & Morgan, 1995). The resulting sense of purpose can promote positive behavioral outcomes and protect against the development of outcomes such as externalizing behaviors. What is more, this adaptive system is self-renewing: the more youth engage in this type of goal setting and reaching, the more they will observe its rewards, and the more likely this cycle will continue (Masten, 2008). This study sought to delve further into whether school motivation can function as a mitigating process in the development of adolescent externalizing problems related to experiences of harmful parenting features.

Conceptualizing parental influence according to separate features

Parental influence on children's development has largely been discussed in the context of parenting styles as conceptualized by Baumrind (1967). The parenting styles framework aimed to capture parenting that stems from parental beliefs, goals, and behaviors, but which at the same time is distinct from these attributes (Baumrind, 1967, 1971; Darling & Steinberg, 1993; Symonds, 1939). Baumrind identified three main styles of parenting based in the concepts of control and warmth: authoritative, authoritarian, and permissive. A final style, negligent parenting, was identified and added later by Maccoby and Martin (1983). Researchers have widely used parenting styles ever since to understand the role of parenting in the development of children and adolescents (e.g., Aunola & Nurmi, 2005; Darling & Steinberg, 1993; Marsiglia, Walczyk, Buboltz, Griffith-Ross, 2007; Mason, Cauce, Gonzales, & Hiraga, 1996; Milvesky, Schlechter, Klem, & Kehl, 2008; Neel, Maitre, Stark, & Chorna, 2018; Shen, Cheah, & Yu,

2018; Steinberg, 2001; Steinberg, Blatt-Eisengart, and Cauffman, 2006; Steinberg, Lamborn, Dornbusch, & Darling, 1992; Steinberg, Mounts, Lamborn, & Dornbusch, 1991; Steinberg et al., 1994; 2006; Thompson et al., 2003).

There are, however, important limitations to exclusively relying on the parenting styles framework. First, in order to understand relations between specific parenting features and adolescent externalizing behaviors, it is necessary to measure each of these constructs separately. In addition to being conceptually efficacious, a focus on separate features of parenting allows for effective translation of this work for lay-audiences, reliable prognoses of what parent and child factors put youth at increased risk for poor developmental outcomes, and guidance regarding what interventions remedy these risks and enhance the likelihood for resilience. Next, parental control is a key feature of rearing, and much of the variability observed in parenting and youth behavioral outcomes may be rooted in differences in parental approaches to control (e.g., Barber & Xia, 2013; Baumrind, 1966; 1967; 1971; Fletcher, Steinberg, & Williams-Wheeler, 2004; Gray & Steinberg, 1999; Maccoby & Martin, 1983). Given the centrality of parental control in youth behavioral outcomes, measuring parental control features directly and modeling their associations with adolescent externalizing behaviors is critical for achieving a robust understanding of what features of parenting pose the most risk for adolescent behavioral outcomes. The present study both identifies and considers the influence of separate features of parental control on adolescent externalizing behaviors.

There are three features or dimensions of parenting that exist on a spectrum and have consistently emerged as characteristic of Western parenting behaviors, holding across parent and child gender, as first identified by Schaefer in 1965 (see Schuldermann & Schuldermann, 2010 for a review). These include psychological autonomy to control, firm behavioral control to lax

behavioral control, and acceptance to rejection (Barber, Olsen, & Shagle, 1994; Baumrind; 1971; 1991; Bean, Barber, & Crane, 2006; Bean & Northrup, 2009; Margolies & Weintraub, 1977; Lamborn & Felbab, 2013; Petterson & Rollins, 1987; Schaefer, 1965; Steinberg, 1994; Steinberg, Dornbusch, & Brown, 1992). One thing that can be deduced from the robustness of these findings is that differentiation between the two types of parental control---psychological and behavioral---is critical for contextualizing how parents influence their children (Steinberg, 1990). This is possible with the present study's focus on these individual parenting features. In addition, for studies like the present that seek to understand correlates of adolescent resilience in a larger, developmental-systems context, framing parenting features as existing on an asset to risk spectrum is most conceptually aligned with capturing the functioning of these mechanisms in the real world (Masten, 2011; 2014; 2018).

The effects of problematic parenting features on adolescent externalizing behaviors

Parenting is primary and central in its influence on child and adolescent development, however, it is also axiomatic that parent-child relationship influences are bidirectional. Children influence their parents' parenting and parents influence their children's functioning. Over time, the pattern, direction, and degree of influence can vary due to the features of the developmental stage being considered and the particular variables being assessed (e.g., Barber, Maughan, & Olsen, 2005; Blos, 1979; Laursen & Collins, 1988; Pardini, 2008; Steinberg, 1989; Stice & Barrera, 1995). While the present longitudinal study focused on the effect of specific separate features of problematic parenting on adolescent externalizing behaviors, that is not to say that this is the only direction of influence or interplay of factors taking place.

Individual parenting features can function as either assets or risks for youth wellbeing (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Masten, 2001). Youth who

report experiencing parenting characterized by rejection, psychological control, neglect, inconsistent discipline, or permissiveness are at higher risk for externalizing behavior problems. These can include engaging in antisocial, oppositional, or defiant behaviors, aggression, delinquent activities, and affiliating with deviant peers (e.g., Akse, Hale, Engels, Raaijmakers, & Meeus, 2005; Crosswhite & Kerpelman, 2009; Hoskins, 2014). Previous work assessing the influence of problematic parenting on adolescent externalizing behaviors has consistently shown the greatest effects for parent psychological control when included simultaneously with lax behavioral control and parent rejection (e.g., Bai, Liu, & Xiang, 2020; Hoeve et al., 2009; Janssens et al., 2009; Pinquart, 2017). Parent psychological control manifests as low respect for youth psychological autonomy or security (i.e., mental or emotional stability). This involves attempts at extreme influence or management of youth thoughts, emotions, beliefs, feelings, or attitudes (Barber, 1996; Barber & Harmon, 2002; Lin, Harrist, Lansford, Pettit, Bates, & Dodge, 2020). Passive aggressiveness and attempts at pressuring or inducing guilt or anxiety in children and adolescents are cornerstones of this parenting feature (Barber, 1996; Donohue, Tillman, Perino, Whalen, Luby, & Barch, 2020; Muris & Meesters, 2014).

Parent psychological control is especially threatening to youth during adolescence when identity formation, autonomy seeking and independence drives are central (Barber & Harmon, 2002; Wang, Pomerantz & Chen, 2007). These developmentally normative drives are in direct conflict with parent psychological overreaches in order to control their child, and externalizing behaviors during adolescence are a common outcome. Psychologically controlling parenting severely undermines attachment security between youth and parents, while also dismissing youth needs for emotional autonomy. As a result, youth may seek out independence in terms of their activities and the risky nature of these activities when they do not have this independence

psychologically from their parents. This may help to explain why parent psychological control is consistently linked with behavioral problems, especially during adolescence (Barber & Harmon, 2002; Lamborn, Mants, Steinberg, & Dornbusch, 1991; Steinberg, 2001; Steinberg, 2014).

Adolescent externalizing behaviors related to poor parenting have cascading effects that extend into adulthood (particularly if these difficulties manifested in childhood). Some of these include substance addiction, interpersonal relationship difficulties, unstable employment history, and psychiatric disorders (Bennett, Lipman, Brown, Racine, Boyle, & Offord, 1999; Campbell, Shaw, & Gilliom, 2000; Champion, Goodall, & Rutter, 1995; Moffitt, 1993). Given the far-reaching individual and societal consequences posed by these risks and the potential for positive growth during adolescence, exploration of mechanisms within reach that can protect youth during this sensitive developmental period is critical.

In addition to the negative effects of parent psychological control on adolescent behavior outcomes, adolescents experiencing parent psychological control may over time experience a loss of positive agency and motivation in their own lives. These youth may be less likely to pursue their own aspirations, and, therefore, less likely to experience the meaningful cognitive rewards associated with success. This in turn can disrupt fundamental, adaptive reward-systems from taking root during adolescence, at a time in cognitive development when there is elevated benefit to be reaped (Masten, 2014; Steinberg, 2014), given accelerating and vast synaptic pruning and structural remodeling taking place (Crone & Elzinga, 2015; Furhmann et al., 2015; Grydeland, 2013; Steinberg, 2014; Tamnes et al., 2010; 2013).

Next in terms of harmful parenting features on adolescent behavioral outcomes is parent rejection, which has long term effects in the form of aggressive, criminal, and anti-social behaviors spanning over two decades, from ages 8 to 30 (Khaleque & Rohner, 2012; Lefkowitz,

Eron, Walder & Huesmann, 1977; Huesmann, Eron, Lefkowitz & Walder, 1984). These effects might be exacerbated during adolescence when youth exhibit an increase in risky behaviors (Davies & Beech, 2010; Stice & Barerra, 1995). Additionally, during adolescence peer influence can present a greater risk for externalizing problems for youth facing parental rejection, because these youth rely more heavily on peers for acceptance and validation (Hoeve et al., 2009).

The final problematic parenting feature considered in the present study is that of lax behavioral control. Parent behavioral control reflects concern regarding a child's activities, location, plans, peer and adult influences, and largely on exerting influence over these domains of interaction. Lax behavioral control can present problems for adolescent behavioral outcomes, contributing to greater externalizing behaviors (e.g., Barber, 1996; Gittis & Hunt, 2019). The association between lax behavioral control and greater externalizing behavior problems has been mostly explained by low supervision, guidance, and concern as to the whereabouts or activities of youth and the increased potential for time spent engaging in harmful or risky activities (e.g., Barber, Olsen, & Shagle, 1994; Hinnant, Erath, Shimizu, & El-Sheikh, 2019).

Behavioral control is a critical aspect of effective parenting and serves a positive socialization function as it promotes behavioral and emotion regulation, executive function skills, and reduces the likelihood of youth engaging in externalizing behaviors (Baumrind, 1996; Llorca et al., 2017; Schroeder & Kelley, 2008; Steinberg, 2001). Whereas lax parenting reinforces externalizing behavior problems by not setting limits or expectations for appropriate behavior, among other reasons (Reid et al., 2002), these behaviors become especially disruptive in adolescence as youth increasingly engage in risky behaviors that include experimentation with substances, risky sexual experiences, and engagement with deviant peers (Hinnant et al., 2019).

Sex differences within adolescent externalizing behaviors related to parenting

It is important to differentiate between male and female risk for externalizing behaviors that have been robustly demonstrated throughout the decades from childhood to adolescence, (e.g., Bongers, Koot, Der Ende, & Verhulst, 2004) if we are to adequately understand how resilience-supporting mechanisms might function in each half of the population, to minimize these risks related to parenting. Research regarding female externalizing behaviors and disorders is limited when compared to this research in males. Available research shows male youth are at higher risk for externalizing problems compared to female youth who are more prone to internalizing. Males also exhibit an earlier age of onset of externalizing problems than females, as early as elementary school (Guze, 1976; Korhonen, Luoma, Salmelin, Siirtola & Puura, 2018). In comparison, females tend to show these behaviors mainly during adolescence (Dekker, Ferdinand, van Lang, et al., 2007; Korhomen, Luoma, Salmelin et al., 2014; Maschi, Morgen & Bradley, 2008). By adolescence, male and female rates of externalizing behaviors are similar (compared to those in childhood when males overwhelmingly exhibit higher rates of externalizing behaviors) when looking specifically at aggression. However male delinquency remains higher than that of females during this time (Lansford, Laird, Pettit, Bates, & Dodge, 2014).

Puberty is the most salient developmental period during which sex difference in externalizing behaviors can be observed (Ehremsaft, 2005; Hoffman & Su, 1997; Eschenbeck, 2007; Ireland & Widom, 1994; Kenaan, Loeber, & Green, 1999; Leadbeater, 1995; Loeber & Keenan, 1994; Maschi, Morgen, Bradley & Hatcher, 2008; Stiles, 2000; Tanner, 1981). Overwhelming literature shows that early puberty in particular is a risk factor for externalizing behavior problems for both male and female youth (e.g., Felson & Haynie, 2003; Haynie, 2003;

Cota Robles, Neiss, & Rowe, 2002). In addition, variation in mood related to hormonal changes is highest in pre- to early adolescence (manifesting as depression in females and aggression in males; Buchanan, 1992), the time period during which youth in the present study reported on parenting features (between ages 10 and 12).

Key features of parenting have been observed to impact male and female adolescents both in similar and unique ways. Pre-adolescent males on average report experiencing greater parent behavioral control than their female counterparts (Barber, 1996; Cetinkaya, 2019; Rodger, 1999). In comparison, female youth report experiencing more parent psychological control (Albertos et al., 2016). This is true for both mother and father parenting (Barber, 1996; Cetinkaya, 2019). Several studies have found no significant difference for how mother and father psychological control influence externalizing behaviors in youth (Barber, 1996; Lansford et al., 2014; Soenens, Luyckx, Vansteenkiste, Duriez, & Goossens, 2008). However, the trajectory of parental psychological control has historically differed for male and female youth. Whereas males report experiencing increasing psychological control until mid-adolescence, after which time it begins to decrease, females report increasing amounts of psychological control throughout mid-adolescence (Barber, 1996).

When considering parental rejection's influence on male and female adolescents, we can quickly glean that this problematic parenting feature is utterly damaging to both male and female youth's self-esteem and assessments of feelings of competence (e.g., Golder, Abir, & Sachar, 2017). At the same time however, we can also observe that research is limited for understanding whether and how male and female youth experience mother and father rejection in unique ways. We know that fathers tend to be more rejecting and less accepting than mothers (Dwairy, 2010; Rohner, 1960) and sons report experiencing more rejection and less acceptance by both parents

than daughters (Dwairy, 2010). Though parent rejection has consistently been related to poor behavioral functioning for both male and female youth (Khaleque & Rohner, 2002; Rohner & Khaleuqe, 2005).

Parental rejection can result in not only a feeling of estrangement towards the parent but can also towards the self. Youth might learn that they or parts of themselves are rejected and should be repressed (Winnicott, 1965) which can lead to externalizing behaviors including aggressiveness and substance use and abuse, with internalizing comorbidity also fairly common, however more in females than males (Rohner, 1960; Woeckener et al., 2018). This may also be related to the more negative worldview that both male and female youth facing parental rejection seem to hold compared to their peers who experience less rejection and more acceptance by their parents (Rohner, 1960; Rohner et al., 2010). Youth facing parental rejection also experience impediments to their personalities wherein they may exhibit problematic tendencies in their personal approach with others or even develop personality disorders (Rohner, 1986). This can influence behavioral outcomes such that these youth are more likely to experience verbal or physical altercations with peers and authority figures (Weymouth, Buehler, Zhou, & Henson, 2016).

In concluding this brief discussion of the impact of individual mother and father parenting features on male and female adolescent behaviors, it is important to note that limited previous work has shown that both sons' and daughters' relationships with their mother and father influence that parent's parenting on youth outcomes, while at the same time impacting the youth-perceived parenting of the opposite parent, both on related and not immediately related parenting features (e.g., Barber, 1996; Murray, Dwyer, Rubin, Knighton-Wiser, & Booth-LaForce, 2013). For example, the relationship with fathers for sons is a more salient determinant

of behavioral health than it is for daughters, and plays a more important role in son's adjustment than it does for daughters (Temmen & Crockett, 2020; Wenk, Hardesty, Morgan, & Blair, 1994). The saliency of the father-son relationship also impacts how behavioral features of father parenting influences males and how psychological features of mother parenting influences males. Looking at another example, the impact of mother psychological control on male aggression depends on the relationship between the son and father (Murray et al. 2014). This variability has resulted in mixed findings when it comes to the impact of youth-perceived mother or father parenting on male and female youth outcomes.

Achievement motivation during adolescence and its development in the school context

Achievement motivation involves the activation and maintenance of goal-directed behavior (Morgan et al., 1993; Rothbart & Hwang, 2005). It is not a stable trait, but instead a dynamic process that develops over the course of life and changes as cognition develops and environmental context and circumstance change, to impact adolescent decision-making and behaviors (Barrett & Morgan, 1995; Kanwal, Jung, & Zhang, 2015). Generally, adolescence is a time when youth motivation trends downwards (Gnambs & Hanfstingl, 2016). Over the course of adolescence, there is greater variability in the degree of school motivation exhibited by youth, as they are increasingly influenced by diverse environments and actors within these environments (Busch, Rossnagel, Knauf-Jensen, & DesRosiers, 1995).

Yet, adolescence may also be a key period during which youth begin to conceptualize motivation by determining the relevance of this construct to their lives. It is a critical time for not only the biological and cognitive changes that set the stage for emerging adulthood (Hoskins, 2014; Steinberg, 2014), but also for the development of drives and motivations, based on how much mastery youth feel they exhibit in their environment (Kanwal, Jung, & Zhang, 2015;

Masten, Obradovic, & Burt, 2006; Patrick, Skinner, & Connell, 1993; Steinberg, 2005; 2014; Weiner, 1985). This feeling of mastery drives us to make individual attempts at interacting with and achieving goals within the environment (Barrett & Morgan, 1995; Kanwal, Jung, & Zhang, 2015; Kashdan & Silva, 2008).

The school environment is a prime setting for mobilizing adaptive achievement orientation and promoting positive associations and emotional states related to goal setting and reaching (Kanwal, Jung, & Zhang, 2015; Pianta & Walsh, 1998; Pianta & Walsh, 2014). This setting provides many opportunities for experiencing developmental demands related to both intra- and inter-personal goals (Masten et al., 2008; Pianta & Walsh, 1998; Pianta & Walsh, 2014). Further, schools play a critical role in encouraging the development of other fundamental adaptive systems such as community, friendship, and motivational-reward systems that can support youth in effectively coping with challenges over time (Masten & Motti-Stefanidi, 2009; Masten, Herbers, Cutuli, Lafavor, 2008; Pianta, 2006; Pianta & Steinberg, 1992; Reimer, 2002). Therefore, the school context is not only important for academic learning, but also activates motivational reward systems that encourage goal setting, as well as positive and effortful behaviors in pursuit of those goals (Masten et al., 2008; Masten & Motti-Stefanidi, 2009; Reimer, 2002; Weiner 1985). These motivational systems are self-renewing (Masten et al., 2008), meaning the more youth engage in this type of goal setting and reaching, the more they will observe its rewards, culminating in a beneficial adaptive cycle.

During adolescence the school context primes youth to build knowledge, identify goals, and seek competences regarding those goals (Kashdan & Yuen, 2007; Masten, Hubbard, Gest, Tellegen, Garmezy, & Ramirez, 1999). Activation of the reward system during adolescence is not only beneficial for meeting an immediate goal but more broadly shapes and progresses

cognitive development. Engaging environments that activate motivational processing during adolescence allow the individual to be more attuned to learning and adept at adapting to environmental changes (Dahl, 2004; Ernst, 2014; Kanwal, Jung, & Zhang, 2015; Masten, et al., 1999; Spear, 2000; Steinberg, 2014; Tellegen, Garmezy, & Ramirez, 1999).This in and of itself can extend plasticity of the adolescent brain (Dahl, 2004; Kanwal, Jung, & Zhang, 2015; Kashdan & Yuen, 2007; Steinberg, 2014).

Adolescence is an incredibly malleable period in youth cognitive development, for better (e.g., quick learning is possible, cognitive agility and flexibility, adept for environmental adaptivity/can "go with the flow") or worse (e.g., drug use can harm ongoing brain development; mental health issues typically emerge during this period of time; undeveloped frontal lobe presents limits to future projections, judgment, and decision making). For these reasons, the motivation to succeed in the school context might be a specific, formative experience for adolescent behavioral outcomes, so much so that motivation to succeed within this context may moderate the negative effects of environmental adversity experienced outside of school.

Window of opportunity: cognitive, social, and environmental factors for adolescent resilience

The adolescent period of development is a sort of "sweet spot" and serves a uniquely transitive role for youth who have faced threats to healthy development (e.g., Dahl, 2004; Masten et al., 1999; Steinberg, 2005; Steinberg, 2014). The power of resilience to be engaged during adolescence can be related to social, environmental, and cognitive factors. For instance, for some youth, it presents one of the first (perhaps only) opportunities to exert influence over their direction and choices in life, that childhood did not allow (Masten, 2018; 2014). For adolescents who face excessive parental behavioral control, for example, obtaining a driver's license or

becoming an adult legally in the United States can bring opportunities that could never be considered previously.

Additionally, specific environmental conditions are particularly beneficial for positive behavioral outcomes during adolescence. Two critical environmental factors that reduce risk for youth facing adversities, like problematic parenting, are novelty and challenge (Berlyne, 1971; Kashdan, 2004; Kashdan & Silva, 2008; Silva, 2006; Steinberg, 2014). Both are also core components for the activation of reward systems and development of motivational frameworks in youth (Berlyne, 1971; Ernst, 2014; Silva, 2005; Steinberg, 2014). This is especially true during puberty, when the presence of sex hormones opens the brain up to even more change (Steinberg, 2014; Steinberg, 2005). In addition, regular experiences of novelty and challenge during this time of great malleability, primes the brain for being able to learn in the future (Ernst, 2005; 2014; Steinberg, 2008; Steinberg, 2014; Sturman & Moghaddam, 2012). In this way, the window of opportunity during adolescence can be opened even wider, and later into development.

In this dissertation, I sought to engage this window of opportunity with more specificity during the "developing a better brake system" phase of adolescent development, at age 16. In this vein it aimed to 1. Assess the influence of parenting experienced in pre-adolescence on externalizing behaviors in mid adolescence; 2. Examine the potential for school motivation, as demonstrated by goal-directed behaviors, to moderate observed effects during the noted window of opportunity; 3. Probe significant interactions by examining of the effects of parenting on adolescent externalizing behaviors at different levels of the moderator across the sample distribution.

Data were collected as part of the Center for Education and Drug Abuse Research (CEDAR) project. I predicted that school achievement motivation (a fundamental adaptive

system) may buffer the impact of problematic parenting (experienced between ages 10 and 12) on adolescent externalizing problems (a maladaptive response) at age 16. This work can shed light on how school motivation may function as a moderator and mitigate threats associated with problematic parenting at an especially opportunistic time in adolescent cognitive development.

CHAPTER 2
METHOD

Participants

This study included a sample of youth who were recruited between the ages of 10 and 12 and then followed up at age 16 as part of the Center for Education and Drug Abuse Research (CEDAR) project. Data collection began in 1990 and was completed in 2011. The project was funded by the National Institute of Drug Abuse (NIDA). Inclusion criteria were that biological fathers of these youth either had (55%) or did not have (44%) a lifetime diagnosis of a substance use disorder (SUD) or other psychiatric disorder (PD), as defined by DSM-III-R. Final recruitment percentages were of lifetime substance use disorder (SUD), any other psychiatric diagnosis not including SUD, or no lifetime history of psychiatric disorder (see Tarter & Vanyukov, 2001, for detailed study and recruitment information). Importantly, the CEDAR dataset offered both logistical and theoretical facets for answering the question of whether school achievement motivation could be a mitigating force in the relation between problematic parenting and adolescent externalizing problems. This dataset provided longitudinal data which allowed for statistical modeling and discussion of directionality from parenting feature predictors to adolescent externalizing behaviors. Additionally, the dataset included ratings of the proposed moderator, adolescent school motivation, conducted by teachers as the preferred source. Last, construction of the motivation measure was based in behavioral correlates of achievement motivation in the school context.

Father recruitment was conducted via multiple platforms including advertisements, public service announcements, random-digit dialing, and treatment facilities. Youth were excluded from this study if they showed any symptoms of Fetal Alcohol Syndrome (FAS), if they were below an intelligence quotient threshold of a score of 80 on the WISC-III-R, if they suffered from any

sort of neurological or biological chronic illness, or if they had any physical or mental developmental disability. The total sample was 775 youth (M = 10.95 ± 0.88 years old; 69% male; 76% Caucasian, 21% African American, 3% multiracial). The final sex distribution favored males because the inclusion of females began approximately 4 years after initiation of the study. The median household income of the sample was $27,311 (range = $4999 to $123,128; M = $28,512, SD = $13,521). Most of the youth included in the study were from low to middle income SES given the income category indices during the time relevant time-period (1990-2004).

Procedure

The CEDAR study was approved by the Institutional Review Board of the University of Pittsburgh. Parents and youth were informed that their right to privacy was protected by a Certificate of Confidentiality awarded by NIDA. To participate in the study, parents provided informed consent and youth gave assent after being given a description of the study and time to have all their questions answered.

Data for this dissertation included two time points from the CEDAR study: first, pre-adolescence from ages 10-12 and second, mid-adolescence, at age 16. It involved self-report by youth related to their parents' parenting at Time 1 (T1), along with youth externalizing symptom reports (completed by teachers) at Time 2 (T2). The study examined the potential moderating role of adolescent school motivation in the relation between psychological control, lax behavioral control and rejection and adolescent externalizing problems. Parenting features and adolescent externalizing behaviors were assessed with widely used youth- and teacher-report measures, respectively. Adolescent school motivation was assessed with the same teacher-report measure used to assess externalizing problems by combining items that were adequately

representative of achievement motivation as could be demonstrated behaviorally by youth in the school context and observed by teachers (Connell, 1985; 1985; Patrick, Skinner, & Connell, 1993; Weiner, 1985; 2010; Weiner, Frieze, Kukla, Reed, Rest, & Rosenbaum; 1971). Details regarding all measures used are below.

Measures

Family socioeconomic status. The Hollingshead Index was used to determine family socioeconomic status (SES). Four factors are used including education and occupation of the parents or legal guardians. For measuring education, scores ranged from 1 (equal to less than a seventh-grade education) to 7 (equal to graduate professional education). For occupation, scores range from 1 (equal to farm laborers or service jobs) to 9 (equal to higher executive and major professional jobs). The Hollingshead produces a raw score ranging from 8 to 66 with larger scores indicating higher SES.

Since its conception, the Hollingshead Index has been a valuable tool for understanding how SES is related to other constructs in diverse areas of research including childhood malnourishment, internalizing and externalizing behaviors, and learning disabilities to name a few. But because it was designed in the 1960s and based its education and occupation schema on the census from this time, it is possible that job titles are outdated. In one study, inter-rater reliability of the Hollingshead Index was assessed along with other measures of SES (Cirino, Chin, Sevcik, Wolf, Lovett & Morris, 2002). Results showed that reliability of the Hollingshead Index was highest for assessing two-wage earners in a family (interrater agreement = 96%), and the Hollingshead Index outperformed other SES measures for this group. The Hollingshead Index performed moderately well for determining SES of one-wage-earner families overall, and very well when the one-wage earner was a male (Cirino et al., 2002).

Parenting features. Parenting was assessed at T1 using the 162-item Children's Report of Parental Behavior Inventory developed by Schaefer (1965). This scale measures concepts that sample all major features of a conceptual model for parental behavior (Margolies & Weintraub, 1977). A factor analysis completed by Armentrout and Burger (1972) showed that when reported by children and college students the features most relevant and clearly related to both mother and father parenting included autonomy, encouragement, protectiveness, control, neglect, and rejection.

These concepts can be organized into three larger components of parenting that include warmth, autonomy, and control that exist on three spectrums of asset and risk for each parent. For mother parenting these include acceptance versus rejection (MA vs. MR), psychological autonomy versus control (MPA vs. MPC), and lax behavioral control versus firm behavioral control (MLC vs. MFC). For father parenting, these include father acceptance versus rejection (FA vs. FR), psychological autonomy versus psychological control (FPA vs. FPC), and lax behavioral control versus firm behavioral control (FLC vs. FFC).

Each of these spectrums include two subscales (subfeatures) of mother and father parenting respectively: MA vs. MR and FA vs. FR include Rejection and Self-centeredness scales, MPA vs. MPC and FPA vs. FPC include Respect for Psychological Autonomy and Respect for Psychological Security scales[1], and finally, MLC vs. MFC and FLC vs. FFC include Firm Discipline and Enforcement of Rules scales. Higher scores indicate parenting that is more rejecting and self-centered, psychological autonomy- and security-granting, disciplined and firm.

[1]The two psychological control subscales of the CRPBI were re-framed to represent more autonomy instead of less autonomy, as scores on these subscales increased. Originally 1. Psychological Control through Guilt and 2. Instilling Persistent Anxiety were re-phrased as 1. Respect for Psychological Autonomy and 2. Respect for Psychological Security, respectively.

Adolescent youth assessed each parent's parenting features on a three-point scale by choosing whether an item is *not like = 1, somewhat like* = 2, or *a lot like* = 3. Item responses were summed and higher scores indicated a higher level of that parenting feature (e.g., higher score on Rejection indicates greater parent rejection). Examples of items on each subscale include: *My mother/father seems to see my good points rather than my faults* (Rejection scale), *My mother/father is more concerned with [their] own problems than mine* (Parent-centered scale), *My mother/father says if I loved her/him, I'd do what s/he wants me to do* (Respect for Psychological Autonomy scale), *My mother/father says that someday I'll be sorry that I wasn't a better child* (Respect for Psychological Security scale), *My mother/father lets me get away with a lot of things* (Firm Discipline scale), and *I can talk my mother/father out of an order, if I complain* (Enforcement of Rules scale).

Internal consistency reliabilities were computed for each of the subscales for each parent (Margolies & Weintraub, 1977; Safford, Alloy, & Pieracci, 2007; Schludermann & Schludermann, 1970). Reliabilities for each subscale are as follows: rejection, 16 items per parent; mother: $\alpha = .90$, father: $\alpha = .91$; parent self-centered, 8 items per parent; mother: $\alpha = .75$, father: $\alpha = .79$; parent respect for psychological autonomy, 8 items per parent; mother: $\alpha = .77$, father: $\alpha = .77$), parent respect for psychological security, 8 items per parent; mother: $\alpha = .76$, father: $\alpha = .77$; firm discipline, 8 items per parent; mother: $\alpha = .54$, father: $\alpha = .56$; enforcement of rules, 8 items per parent; mother: $\alpha = .61$, father: $\alpha = .64$.

Adolescent externalizing behaviors. The Teacher Report Form of the Child Behavior Checklist (CBCL-TRF; Achenbach, 1991; Achenbach & Rescorla, 2001) was used to assess adolescent externalizing problems at T2 (age 16). The CBCL also exists as a parent assessment of youth behaviors (CBCL; Achenbach, 1991), however the teacher form was used to avoid

study confounds that would result from employing parents' views to assess youth behavior while at the same time assessing the influence of parenting on that very behavior. For example, a lax parent might be more likely to view their child's behavior as non-problematic compared to a parent who is more firm with their child. In addition, the teacher version of the CBCL was a better choice given the study goals and nature of variables being considered. Previous work with the CBCL has shown rater effects such that a parent's individual approach to parenting influences ratings of their children's externalizing behaviors and are usually harsher than teacher ratings and child self-report (e.g., Stanger & Lewis, 1993). Teacher reports might also offer more specificity related to child behavioral outcomes, potentially because of school contextual demands that elicit a wide range of behaviors and teachers' experience with many children (Drabick, Gadow, & Loney, 2007; 2008; Stanger & Lewis, 1993).

The present study used the externalizing subscale of the CBCL-TRF, which includes Delinquent and Aggressive Behaviors. Teachers rated student's behaviors on a three-point scale with *0 = not true, 1 = somewhat/sometimes true, and 2 = very/often true.* Item responses were summed to create a total score, with higher scores indicating higher levels of externalizing behaviors. Example items that teachers rated regarding student behavior included *Explosive and unpredictable behavior; Behaves irresponsibly; Unusually loud; Lying or cheating;* and, *Defiant, talks back to staff*

The CBCL-TRF has been observed to have high test-retest reliability in measuring problem behaviors in a community sample (e.g., Achenbach, Dumenci, & Rescorla, 2003) and research sample, with test-retest coefficients ranging from mid-to- high .70s and .80s, and good internal consistency, with Cronbach's alpha ranging from $\alpha = .75$ to $\alpha = .84$. In addition, the CBCL-TRF exhibits convergent and discriminative validity (Nakamura, Ebesutani, Berstein, &

Chorpita, 2009) among clinical samples (Seligman et al., 2004) and very good reliability with Cronbach's alpha ranging from .90 to .97 (Achenbach & Rescorla, 2001),

Adolescent school achievement motivation. The Teacher Report Form of the Child Behavior Checklist (CBCL-TRF) was also used to assess adolescent school achievement motivation at age 16 (T2). Individual items for this measure were compiled to measure a behavioral, adaptive achievement orientation in the school context. Items reflected the extent to which adolescent behaviors were congruent with goal setting and positive, effortful behaviors in pursuit of these goals in the achievement context of school. As such, items assessed student persistence, performance, completion of assigned tasks, attention, and effort. Previous research has also identified these behavioral indicators as providing an observable means to understanding student motivation (Bassett et al., 2017; Qu, Wang & Johnson, 2005; Wellborn, 1993).

The final school motivation measure conceptualized for this study demonstrated good reliability with Cronbach's alpha = .93. Teachers rated student behaviors on a scale with *0 = not true, 1 = somewhat/sometimes true, and 2 = very/often true.* Raw scores were totaled. Items included *Fails to finish things [they] start; Cannot concentrate, pay attention for long; Inattentive, easily distracted; Apathetic, unmotivated; Poor school work; Messy work; Underachieving, not working up to potential, Underactive, slow-moving or lacks energy;* and *Fails to carry out assigned tasks.*

Adolescent school learning. Learning at T2 was assessed using the CBCL-TRF and controlled for in all analyses. Teachers rated student's adaptive behaviors in the school context by answering the question "Compared to typical pupils of the same age, how much is [the student] learning?" with *1 = much less* and *7 = much more.*

Statistical Analyses

Bivariate correlations between all measures and descriptive analyses for all measures were conducted using SPSS version 26. Primary statistical analyses utilized Mplus version 8.1, which uses Full Information Maximum Likelihood (FIML) estimation (Muthen & Muthen, 1998 – 2018) to address missing data, which assumes that data are missing completely at random or missing at random. Given this, participants with missing data were not excluded from analyses and all available data were used to estimate model parameters. This avoids sample bias which would be a concern with approaches such as listwise deletion, pairwise deletion, complete case analysis, or mean imputation (Cox, Mcintosh, Reason, &Terenzini, 2014; Graham, 2009). Next, I probed for multicollinearity and ensured that all necessary assumptions for linear regression were met. All regression analyses controlled for youth age, sex, household SES, father lifetime psychiatric disorder status, and school learning at T2.

I conducted a series of regression analyses which assessed the role of individual parenting features and adolescent school motivation on adolescent externalizing behaviors. Parenting feature at T1 was the main effect and adolescent school motivation at T2 functioned as the moderator in relation to adolescent externalizing behaviors at T2. Individual mother or father parenting features were included separately, one at a time, in each regression analysis. Accordingly, Step 1 included adolescent age, gender, father diagnostic status, household education and occupation, an individual father/ mother parenting feature at T1, adolescent learning at T2, and adolescent school motivation at T2. Step 2 included Step 1 variables and the individual parenting feature × adolescent motivation cross-product interaction term. All variables were z-scored (*M = 0, SD = 1*) before inclusion in the regression equations and interaction terms. This served to minimize multicollinearity between predictors and interactions among them

but also aids in the interpretation of simple slopes following the regression analyses (Holmbeck, 2002).

A crucial part of interpretation of the study results was post-hoc probing of significant two-way interaction effects, which for the present study involved conducting simple slopes analyses (Aiken & West; 1991; Holmbeck, 2002). Conditional values on the continuous moderator, motivation, were first computed. These values included one standard deviation above the mean, the mean itself, and one standard deviation below the mean (following Aiken & West, 1991; Preacher, Curran, & Bauer, 2004). This provided high, moderate, and low values on the moderator variable. Using these values, interaction effects between parenting feature and adolescent motivation to predict adolescent externalizing behaviors were computed and visualized by plotting the respective y-intercepts and simple slopes. Subsequently, the slopes were tested for whether they differed significantly from zero (Cohen, Cohen, West & Aiken, 2003).

This post-hoc step allowed for a nuanced understanding of the interaction between parenting feature and adolescent motivation. It provided information about the specific conditions under which the moderator interacts with the predictor to significantly influence the outcome. With this knowledge we can specify which group of adolescents, based on school motivation level, are most influenced by or resilient to problematic parenting.

Aim 1: Identify pathway to adolescent risk: problematic parenting features.

Because of robust previous research showing a link between problematic parenting and poor youth behavioral outcomes, I predicted the following path for risk: youth who experienced more problematic father/mother parenting (i.e., lax behavioral control, psychological control, or rejection) between ages 10 and 12 (T1) would show greater externalizing behaviors in mid-

adolescence at age 16 (T2) than those who experienced more positive parenting (firm mother/father behavioral control, psychological autonomy, or acceptance).

To test this prediction, I conducted separate regression analyses examining the main effect of individual parenting features at T1 on adolescent externalizing behaviors at T2. Specifically, each parenting feature for mothers and fathers included two sub-features or scales that were separately included as predictors in each regression analysis. To assess the impact of mother/father psychological control on adolescent externalizing behavior, externalizing behaviors were regressed on mother/father respect for youth psychological autonomy and mother/father respect for youth psychological security subscales. To assess the impact of mother/father lax behavioral control on adolescent externalizing behaviors, externalizing behaviors were regressed on mother/father enforcement of rules and firm discipline subscales. Last, to assess the impact of mother/father rejection on future adolescent externalizing behaviors, externalizing behaviors were regressed on mother/father parent self-centeredness and rejection subscales (this subscale was named the same as the greater parenting feature it represented).

Aim 2: Identify pathway towards adolescent resilience: school achievement motivation; post-hoc probe significant moderation.

Because of previous work showing the potential of the school context and adaptation within that context to function as a protective system for youth facing adversity at home, I predicted the following path towards resilience: youth who experienced more problematic mother/father parenting in the form of lax behavioral control, high psychological control, or low acceptance at T1, but were high or moderate in school motivation (an adaptive behavior within the school context), would demonstrate lower levels of externalizing behaviors at T2 than their peers who also experienced problematic parenting but were low in school motivation.

Specifically, in separate regression analyses, adolescent externalizing behaviors were regressed on mother/father respect for youth psychological autonomy, mother/father respect for youth psychological security, mother/father lax behavioral control, mother/father enforcement of rules and firm discipline, mother/father rejection of their children, and mother/father parent self-centeredness. I predicted that adolescent school achievement motivation will moderate these relations between T1 problematic parenting and T2 adolescent externalizing symptoms. Variability in problematic parenting will significantly influence adolescents low in school motivation, but not those moderate or high in motivation.

To test this prediction, I conducted moderation analyses assessing the presence of an interaction effect between separate mother/father parenting subfeatures and adolescent school motivation. If the interaction between school motivation and the individual mother/father parenting feature significantly predicts adolescent externalizing behaviors, post-hoc probing of this interaction will be necessary to better understand the nature of the interaction effect.

After carrying out the necessary regression analyses, the next critical aim of this study was to understand the nature of any observed moderation effects of school motivation on the relation between features of problematic parenting and adolescent externalizing behaviors. Specifically, it was necessary to probe when and how problematic parenting influenced adolescent externalizing outcomes at different levels of school motivation. This would allow insight into how school motivation can potentially protect adolescents facing problematic parenting from manifesting externalizing behaviors.

Additional statistical testing after the discovery of significant moderation effects would provide critical information about when problematic parenting poses a significant risk for

adolescent externalizing outcomes and when it does not. This could be accomplished by first, divvying up the interaction effect on the moderating variable, adolescent school motivation, at low (one standard deviation below the mean), moderate (at the mean), and high values (one standard deviation above the mean). Next, post-hoc tests plotting and testing the significance (*t*) of simple slopes on the predictor, problematic parenting subfeature, would indicate when the slope at low, moderate, and high levels of school motivation was significantly different from zero. If the simple slopes of motivation on individual mother or father parenting subfeatures are not significantly different from zero, it can be inferred that motivation at the respective level does not affect the relation between problematic parenting and adolescent externalizing behaviors. On the other hand, if the simple slope does differ significantly from zero it can be concluded that for adolescents with the respective level of motivation, levels of externalizing problems differ based on levels of problematic parenting.

Aim 3: Explore Aims 1 and 2 for male adolescents, with caution

The final aim of this study was to explore effects of mother and father parenting and school achievement motivation on adolescent externalizing problems, while looking solely at males. Because of robust previous research showing the greater susceptibility of male youth to externalizing behaviors (based largely in biology) it was important to look more closely at this group if possible. While the sample size for males was not grand after considering missing data, males did make up the grand majority of our overall sample. Though it was not possible for female youth, it was conceptually logical, worthwhile and statistically feasible given the data parameters, to at least explore the mechanisms examined in this greater study, for male youth separately. Accordingly, Aims 1 to 3 were pursued for males only. Nonetheless, caution is warranted given the extensive missing data on the outcome variable of externalizing problems

and the moderator of school achievement motivation. In order to provide useful insight into each gender distribution on the most critical variables, descriptive statistics are included in this dissertation for each sex in Tables 8 and 9 within exploration of Aim 3.

CHAPTER 3

RESULTS

Descriptive statistics

Correlations among measures were observed in the expected directions. Parenting features were significantly correlated with one another across psychological, emotional, and behavioral forms, ranging in strength from $r = .04$ to $r = .79$. More problematic parenting features were largely significantly and positively correlated with each other. Similarly, more positive parenting features were significantly associated. These correlations were also observed across and within mother and father parenting. For example, positive or problematic mother parenting features were respectively associated with both positive or problematic mother and father parenting features. School learning and motivation at T2 (adolescent 16) were significantly associated with more positive parenting at T1 (ages 10-12), whereas lower school learning and motivation were associated with more problematic parenting. Adolescent externalizing behaviors at T2 were negatively correlated with school learning and motivation at T2 with $r = -.63$ and $r = -.84$, respectively. Externalizing behaviors at T2 were negatively correlated with more positive psychological and emotional features of parenting, and positively correlated with more problematic psychological and emotional parenting features. Bivariate correlations between all continuous study variables can be seen in Table 1.

Analyses controlled for youth age, sex, household SES, father lifetime psychiatric disorder status, and school learning at T2. Sex was not a significant predictor of externalizing behaviors at T2 (Tables 2 to 5), however exploratory analyses looking at male youth separately were conducted because of the greater susceptibility of this group to externalizing behaviors as demonstrated robustly in previous work. Study descriptive can be seen in Tables 8 and 9.

Table 1

Bivariate Correlations Among Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. F Reject T1	_																	
2. F Self-centered T1	.793**	-																
3. F Res for Psy Aut T1	0.043	.136**	_															
4. F Res for Psy Sec T1	-.117**	0.041	.661**	_														
5. F Firm Dis T1	-.273**	-.230**	-.098**	-.113**	_													
6. F Enf Dis T1	.225**	.287**	.160**	0.066	.427**	_												
7. M Reject T1	.773**	.599**	0.019	-0.063	-.326**	0.061												
8. M Self-centered T1	.538**	.727**	.118**	.104**	-.243**	.141**	.737**	_										
9. M Res for Psy Aut T1	-0.06	0.041	.909**	.640**	-0.07	.121**	-0.006	.123**	-									
10. M Res for Psy Sec T1	-.123**	0.045	.625**	.911**	-0.033	.137**	-.098**	.098*	.663**	_								
11. M Firm Dis T1	-.320**	-.235**	-.079*	-0.02	.745**	.293**	-.327**	-.244**	-0.068	-0.055	_							
12. M Enf Dis T1	0.007	.100**	.178**	.197**	.288**	.648**	.124**	.221**	.193**	.158**	.451**	_						
13. Adol Age T1	0.06	0.066	.143**	.083*	-0.046	-0.017	.090*	.083*	.128**	0.068	-0.053	0.011	_					
14. HH Educ	-.119**	0.001	.117**	.171**	0.026	-0.001	-0.044	.092*	.138**	.194**	0.002	0.062	0.017	-				
15. HH Occup	-.105**	0.01	.160**	.213**	-0.001	0.067	-.083*	0.067	.157**	.229**	-0.011	.086*	0.063	.592**	_			
16. Adol Schl Lrn T2	-.138*	-0.101	.153**	.216**	0.023	-0.047	-.141*	-0.08	.141*	.259**	0.067	0.034	0.018	.225**	.188**	_		
17.Adol Schl Mot T2	-0.183	-0.116	0.127	.279**	-0.125	-0.106	-0.134	-0.097	.149*	.271**	-0.01	0.068	-0.017	.214**	.191**	.728**	_	
18.Adol Ext Beh T2	.165**	0.097	-.175**	-.254**	-0.036	0.028	.123*	0.077	-.161**	-.269**	-0.051	-0.038	0.012	-.187**	-.163**	-.629**	-.839**	_
M	23.17	12.95	18.14	18.67	19.85	17.81	22.05	12.25	17.75	18.49	20.09	17.52	11.42	13.96	5.2	4.91	15.76	9.8
SD	6.12	3.14	3.47	3.49	2.42	2.72	5.44	2.84	3.53	3.47	2.33	2.61	0.92	1.84	2.3	1.68	4.34	13.62
n	313	313	313	313	313	313	316	316	316	316	316	316	337	337	337	332	243	337

Note: T1 = Time 1 (youth ages 10-12); T2 = Time 2 (adolescent age 16); Adol Age T1 = Average adolescent age at Time 1 (ages 10-12); HH Educ = Household education level at T1; HH Occup = Household occupation score at T1; CRPBI = Child Report of Parenting Behavior Checklist measure; CBCLT - Child Behavior Checklist Teacher Report measure; F Reject T1 = CRPBI father rejection at T1; F Self-centered T1 = CRPBI father self-centeredness in parenting at T1; F Res for PsyAut T1= CRPBI father respect for youth psychological autonomy via low guilt induction at T1; F Respect for Psy Sec T1 = CRPBI father respect for youth psychological security via low anxiety installation at T1; F Firm Dis = CRPBI father use of firm discipline at T1; F Enf Dis = CRPBI father enforcement of rules at T1; M self-centered = = CRPBI mother self-centeredness in parenting at T1; M Res for PsyAut T1= CRPBI mother respect for youth psychological autonomy via low guilt induction at T1; M Respect for Psy Sec T1 = CRPBI mother respect of youth psychological security via low anxiety installation at T1; M Firm Dis = CRPBI mother firm discipline at T1; M Enf Dis = CRPBI mother enforcement of rules at T1; AdolSchlLrn T2 = CBCLT school learning total score at T2; AdolSchl Mot T2 = CBCLT school achievement motivation total score at T2; Adol Ext Beh T2 = CBCLT adolescent externalizing behavior total score at T2.

**p<.01; *p<.05.

Aim 1: Identify pathway to adolescent risk: problematic parenting features to adolescent externalizing problems

Father psychological control was associated with greater adolescent externalizing problems. On the resilience to risk spectrum, father displays of psychological autonomy vs. psychological control (PA vs. PC) at T1 significantly predicted adolescent externalizing behaviors at T2 (p = .04). Specifically, youth who reported lower levels of father respect for psychological autonomy (FRPA) showed higher rates of externalizing behavior up to six years later, during mid-adolescence (B = -0.74, p = .038). This can be seen in Table 2, Step 1. No additional main effects of mother parenting features (unstandardized coefficients ranging from B = -.018 to B = -.068, *ns*) or father parenting features (unstandardized coefficients ranging from B = .015 to B = -.064, *ns*) on adolescent externalizing behaviors were observed.

Aim 2: Identify pathway towards adolescent resilience: school achievement; post-hoc probing of significant moderation effects

School achievement motivation was strongly negatively correlated with externalizing behavior problems with r = -.84, p < .01 (see Table 1). Within T2, results consistently showed a significant effect of adolescent school achievement motivation (ASAM) on externalizing behaviors (*ps* < .001). School motivation appeared to act as a protective factor such that youth with higher school motivation manifested lower rates of externalizing behaviors in mid-adolescence (unstandardized coefficients ranging from B = -.806 to B = -.809). These main effects can be seen in Tables 2 to 5, Step 1. Across four observed problematic parenting features (low father and mother respect for youth psychological autonomy, father parenting self-centeredness and rejection of youth) that were associated with greater externalizing problems in

adolescence, youth with high school motivation exhibited the lowest rates of externalizing problems related to observed problematic parenting features while youth with low motivation were at the greatest risk and showed the highest rates of externalizing problems (see Figures 1 to 4).

Now, onto post-hoc probing of significant moderation effects. ASAM interacted (separately) with both father and mother respect for youth psychological autonomy (respectively, FRPA: $B = .107$, $p < .001$; MRPA: $B = .075$, $p = .029$) on the PA vs. PC scale to predict adolescent externalizing behaviors (See Step 2 in Tables 2 and 3). Adolescents low in motivation were significantly impacted by FRPA and MRPA and showed the highest rates of externalizing problems compared to the moderate- and high- motivation groups (see Figures 1 and 2, respectively). Plotting simple slopes and testing their significance further confirmed that adolescents low in school motivation were impacted by both FRPA, $t(226) = -3.51$, $p < .001$ and MRPA, $t(227) = -2.54$, $p = .012$, in the same manner. For these low- motivation adolescents, lower FRPA or MRPA at T1 was predictive of greater externalizing behaviors at T2, whereas higher T1 FRPA or MRPA predicted lesser T2 externalizing behaviors.

In comparison to the low-motivation groups, high or moderate school motivation groups seemed unfazed by low FRPA or MRPA. In these cases, ASAM appeared to function as a protective factor against the deleterious effects of low FRPA or MRPA on adolescent behavioral outcomes. For adolescents with moderate levels of school motivation, neither FRPA, $t(226) = -1.79$, $p = .074$, nor MRPA, $t(227) = -1.39$, $p = .165$, impacted externalizing outcomes in mid-adolescence. Similarly, for highly motivated adolescents, neither FRPA, $t(226) = .800$, $p = .424$ nor MRPA, $t(227) = .482$, $p = .630$, influenced externalizing behaviors. In summary, adolescents who experienced low FRPA or MRPA and had low motivation showed the highest levels of

externalizing behaviors in response to this problematic parenting feature. However, their highly or moderately motivated peers who also experienced low FRPA or MRPA did not show this effect. Last, no interaction effect was observed between the second subfeature of parent psychological control and adolescent achievement motivation. Namely, neither low-, moderate-, nor high-motivation youth were impacted significantly by mother or father respect for youth psychological security (MRPS or FRPS, respectively). Regression coefficients were collapsed across motivation level (MRPS: $B = .007$, *ns*; FRPS: $B = .010$, *ns*, respectively).

Table 2

Moderated regression analyses predicting adolescent externalizing symptoms
from father respect for psychological autonomy and adolescent school motivation.

Variable	B	SE B	β
Externalizing symptoms T2			
Step 1			
Adolescent sex	-0.062	0.074	-0.028
Adolescent age	0.035	0.034	0.035
Adolescent school learning	-0.013	0.046	-0.013
Household education	0.013	0.038	0.013
Household occupation	0.02	0.039	0.02
Father diagnosic status	-0.147	0.066	-0.073*
Father respect for psychological autonomy T1 (FRPA)	-0.074	0.035	-0.074*
Adolescent school achievement motivation T2 (ASAM)	-0.809	0.045	-0.832**
Step 2			
Adolescent sex	-0.048	0.073	-0.022
Adolescent age	0.046	0.033	0.046
Adolescent school learning T2	-0.028	0.046	-0.028
Household education	0.014	0.038	0.014
Household occupation	0.017	0.038	0.017
Father diagnosic status	-0.149	0.065	-0.074*
Father respect for psychological autonomy T1 (FRPA)	-0.067	0.035	-0.067
Adolescent school achievement motivation T2 (ASAM)	-0.777	0.046	-0.799***
FRPA X ASAM	0.107	0.034	0.113***

*$p < .05$;
**$p < .01$
***$p < .001$.

Table 3

Moderated regression analyses predicting adolescent externalizing symptoms
from mother respect for youth psychological autonomy and adolescent school motivation.

Variable	B	SE B	β
Externalizing symptoms T2			
Step 1			
Adolescent sex	-0.041	0.074	-0.019
Adolescent age	0.028	0.028	0.028
Adolescent school learning T2	-0.018	0.046	-0.018
Household education	0.011	0.038	0.011
Household occupation	0.017	0.039	0.017
Father diagnosic status	-0.143	0.067	-0.071*
Mother respect for psychological autonomy T1 (MRPA)	-0.044	0.035	-0.044
Adolescent school achievement motivation T2 (ASAM)	-0.806	0.046	-0.83***
Step 2			
Adolescent sex	-0.038	0.073	-0.017
Adolescent age	0.035	0.034	0.035
Adolescent school learning T2	-0.027	0.046	-0.027
Household education	0.013	0.038	0.013
Household occupation	0.014	0.039	0.014
Father diagnosic status	-0.138	0.066	-0.069*
Mother respect for psychological autonomy T1 (MRPA)	-0.042	0.035	-0.042
Adolescent school achievement motivation T2 (ASAM)	-0.781	0.047	-0.804***
MRPA X ASAM	0.075	0.035	0.081*

*$p < .05$;
**$p < .01$
***$p < .001$.

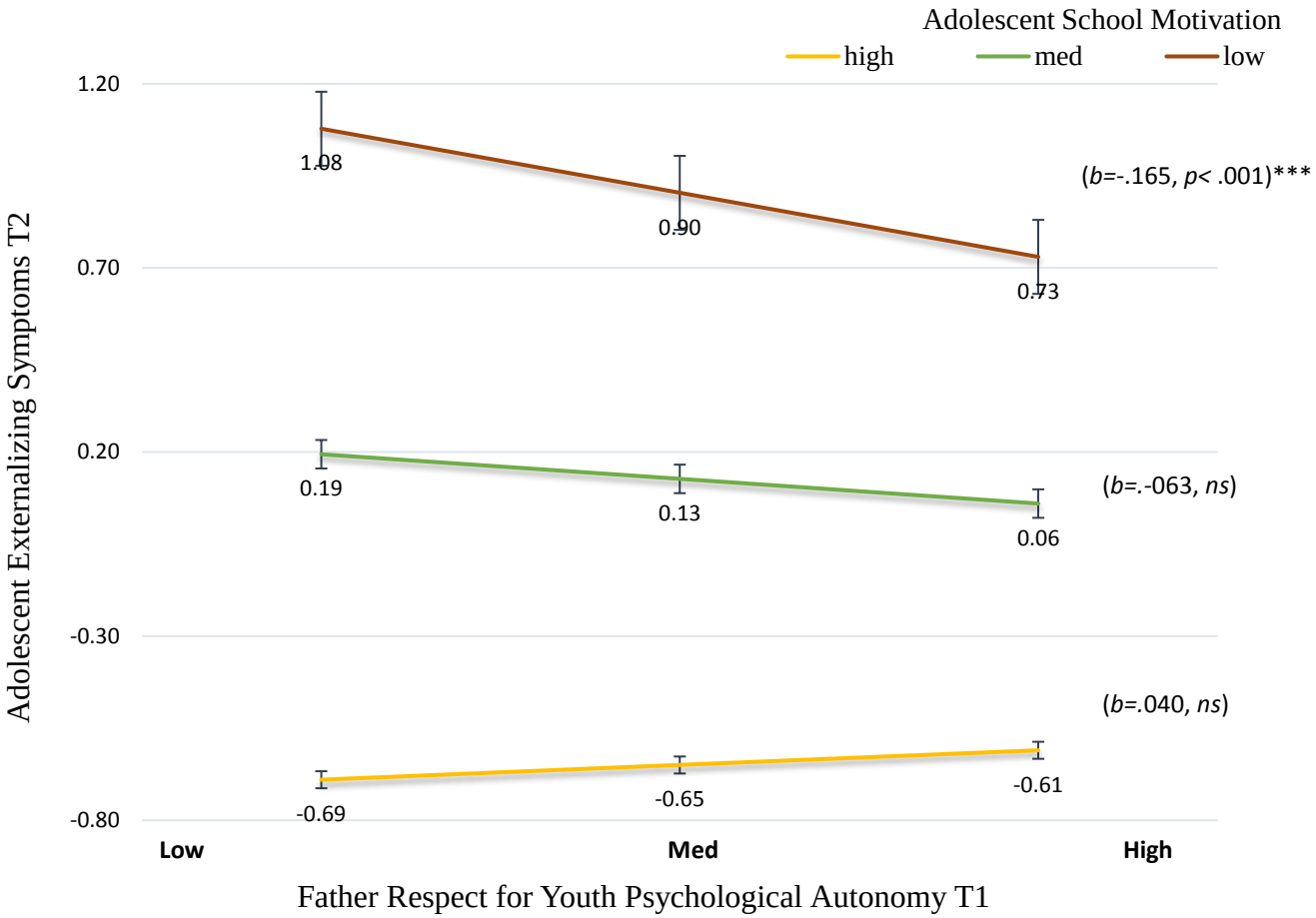

Figure 1. Regression lines showing relation between father respect for psychological autonomy and adolescent externalizing symptoms, as moderated by school motivation. Three levels of high, moderate (med), and low were computed for both father respect for youth psychological autonomy and adolescent school motivation using the mean as the moderate value, one standard deviation above the mean as the high value (+1 SD), and one standard deviation below the mean as the low value (-1 SD). b = unstandardized coefficient (i.e., simple slope); Error bars represent 95% confidence intervals.

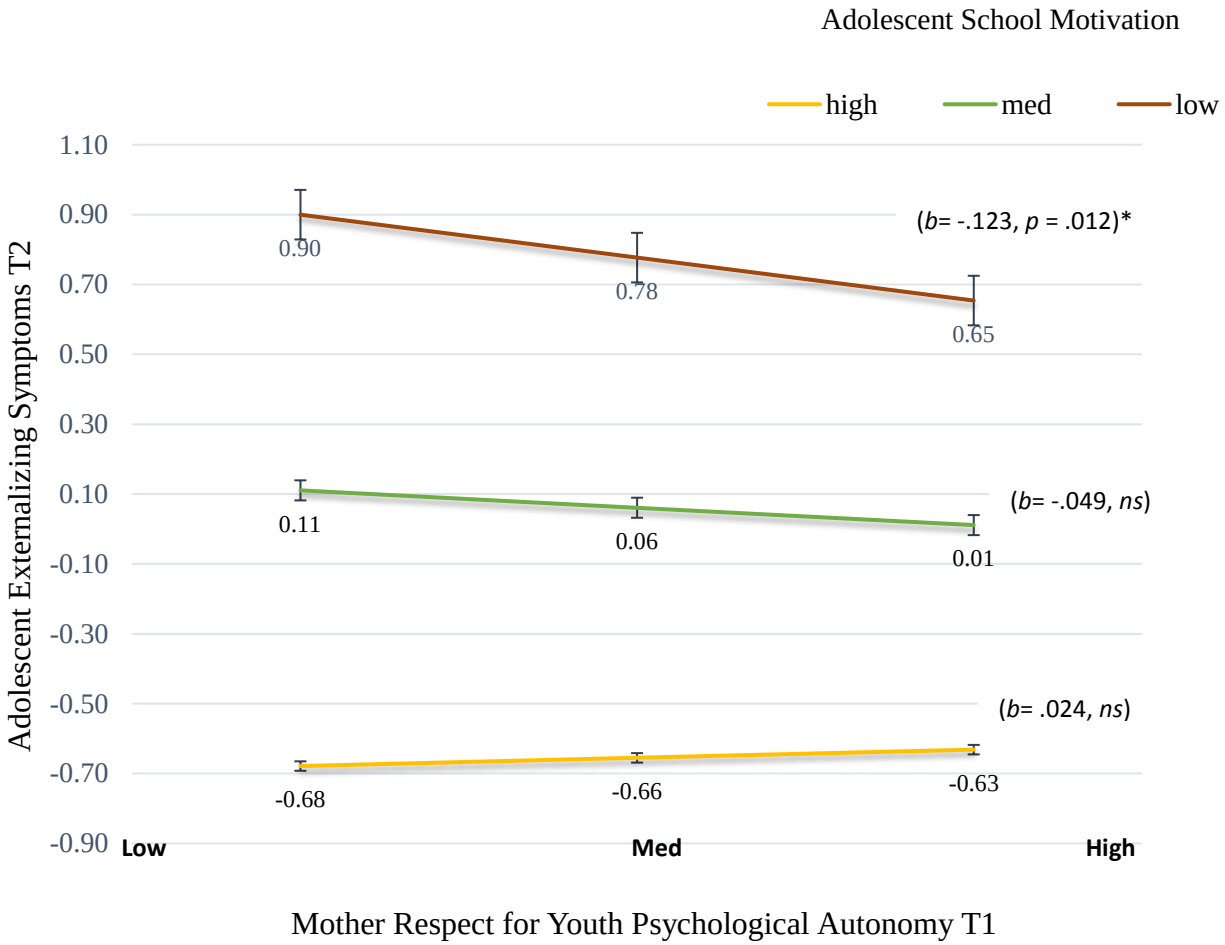

Figure 2. Regression lines showing relation between mother respect for psychological autonomy and adolescent externalizing symptoms, as moderated by school motivation. Three levels of high, moderate (med), and low were computed for both mother respect for youth psychological autonomy and adolescent school motivation using the mean as the moderate value, one standard deviation above the mean as the high value (+1 SD), and one standard deviation below the mean as the low value (-1 SD). b = unstandardized coefficient (i.e., simple slope); Error bars represent 95% confidence intervals.

Next, adolescent motivation level determined how father self-centeredness impacted youth externalizing problems. Results showed ASAM moderated the relation between T1 father parenting self-centeredness (FPS) and T2 adolescent externalizing behaviors (Table 4, Step 2; *B* = -.809, $p < .001$); however, this effect was not observed for mother self-centeredness (*B* = .005, *ns*). Post-hoc probing revealed that the slope of the line for adolescents low in school motivation was significantly different from zero, $t(226) = -2.49$, $p = .014$ (see Figure 3) whereas the slopes for moderate, $t(226) = -.705$, $p = .482$, or highly motivated adolescents, $t(226) = 1.45$, $p = .149$ were not significant. However, the direction of the effect of FPS on externalizing problems among low- motivation adolescents was unexpected: externalizing symptoms decreased as father self-centeredness increased. This was opposite to the prediction that as this parenting feature or risk increased in severity (from low father self-centeredness to high self-centeredness), externalizing problems for low- motivation youth would similarly increase.

When looking at the role of ASAM in the relationship between mother/father behavioral control and adolescent externalizing behaviors, we find no moderation effect. Specifically, on both subfeatures of behavioral control, mother/father enforcement of rules (*B* = -.028, *ns; B* = .067, *ns*, respectively) and firm discipline (*B* = .001, *ns*; *B* = .044, *ns*, respectively) did not interact with ASAM to influence adolescent externalizing behaviors.

Table 4

Moderated regression analyses predicting adolescent externalizing symptoms from father parenting self-centeredness and adolescent school motivation.

Variable	B	SE B	β
Externalizing symptoms T2			
Step 1			
Adolescent sex	-0.022	0.072	-0.01
Adolescent age	0.02	0.033	0.02
Adolescent school learning T2	-0.022	0.047	-0.022
Household education	0.009	0.038	0.009
Household occupation	0.017	0.039	0.017
Father diagnosic status	-0.153	0.068	-0.076**
Father parenting self-centeredness T1 (FPS)	-0.016	0.034	-0.016
Adolescent school achievement motivation T2 (ASAM)	-0.809	0.046	-0.835***
Step 2			
Adolescent sex	-0.046	0.072	-0.021
Adolescent age	0.034	0.033	0.034
Adolescent school learning T2	-0.027	0.046	-0.027
Household education	-0.008	0.038	-0.008
Household occupation	0.029	0.039	0.029
Father diagnosic status	-0.184	0.068	-0.092**
Father parenting self-centeredness T1 (FPS)	-0.013	0.034	-0.013
Adolescent school achievement motivation T2 (ASAM)	-0.804	0.045	-0.829***
FPS X ASAM	0.105	0.035	0.11**

*$p < .05$;
**$p < .01$
***$p < .001$.

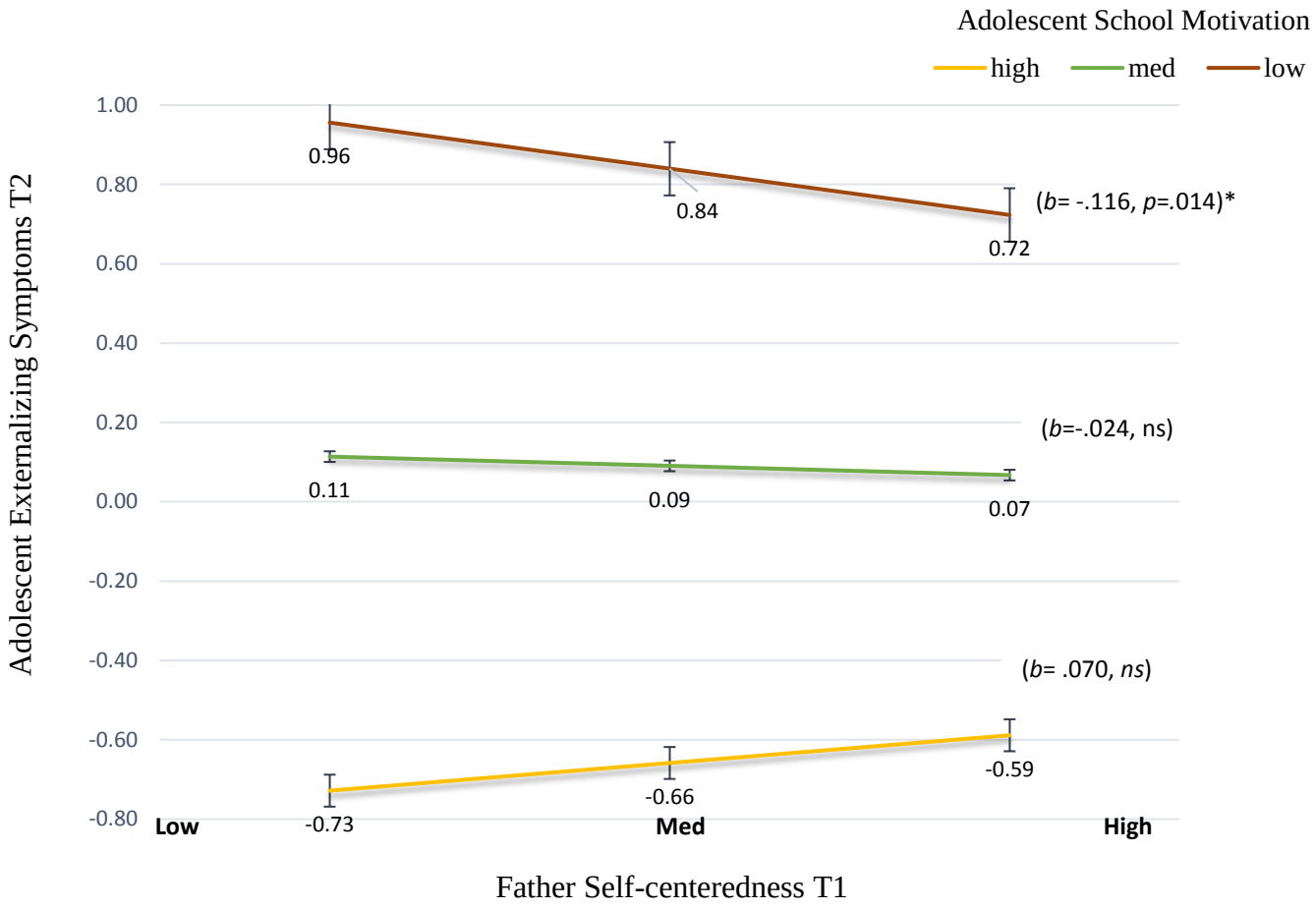

*Figure 3. Regression lines showing relation between father self-centeredness and adolescent externalizing symptoms, as moderated by school motivation. Three levels of high, moderate (med), and low were computed for both father self-centeredness and adolescent school motivation using the mean as the moderate value, one standard deviation above the mean as the high value (+1 SD), and one standard deviation below the mean as the low value (-1 SD). b = unstandardized coefficient (i.e., simple slope); Error bars represent 95% confidence intervals. **

ASAM moderated the relation between father rejection (FR) at T1 and externalizing symptoms at T2 (Table 5; $B = .072$, $p = .043$) but not mother rejection ($B = .016$, *ns*). In post-hoc probing of this interaction, results were not as expected. Though adolescents low in motivation showed the highest levels of externalizing symptoms overall, FR exerted a significant influence on externalizing problems for adolescents high in motivation, $t(226) = 1.68$, $p = .043$, but not low, $t(226) = -1.03$, $p = .303$, or moderately motivated adolescents, $t(226) = .433$, $p = .665$ (see Figure 4).

Table 5

Summary of hierarchical regression analyses predicting adolescent externalizing symptoms from father rejection of youth and adolescent school motivation.

Variable	B	SE B	β
Externalizing symptoms T2			
Step 1			
Adolescent sex	-0.023	0.073	-0.01
Adolescent age	0.019	0.033	0.019
Adolescent school learning T2	-0.02	0.047	-0.02
Household education	0.009	0.039	0.009
Household occupation	0.014	0.039	0.014
Father diagnosic status	-0.142	0.067	-0.071
Father rejection T1 (FR)	0.015	0.033	0.015
Adolescent school achievement motivation T2 (ASAM)	-0.806	0.046	-0.831
Step 2			
Adolescent sex	-0.042	0.073	-0.019
Adolescent age	0.03	0.033	0.03
Adolescent school learning T2	-0.021	0.046	-0.021
Household education	0.001	0.038	0.001
Household occupation	0.023	0.039	0.023
Father diagnosic status	-0.167	0.068	-0.083*
Father rejection T1 (FR)	0.016	0.035	0.016
Adolescent school achievement motivation T2 (ASAM)	-0.816	0.046	-0.841***
FR X ASAM	0.077	0.038	0.077*

*$p < .05$;
**$p < .01$
***$p < .001$.

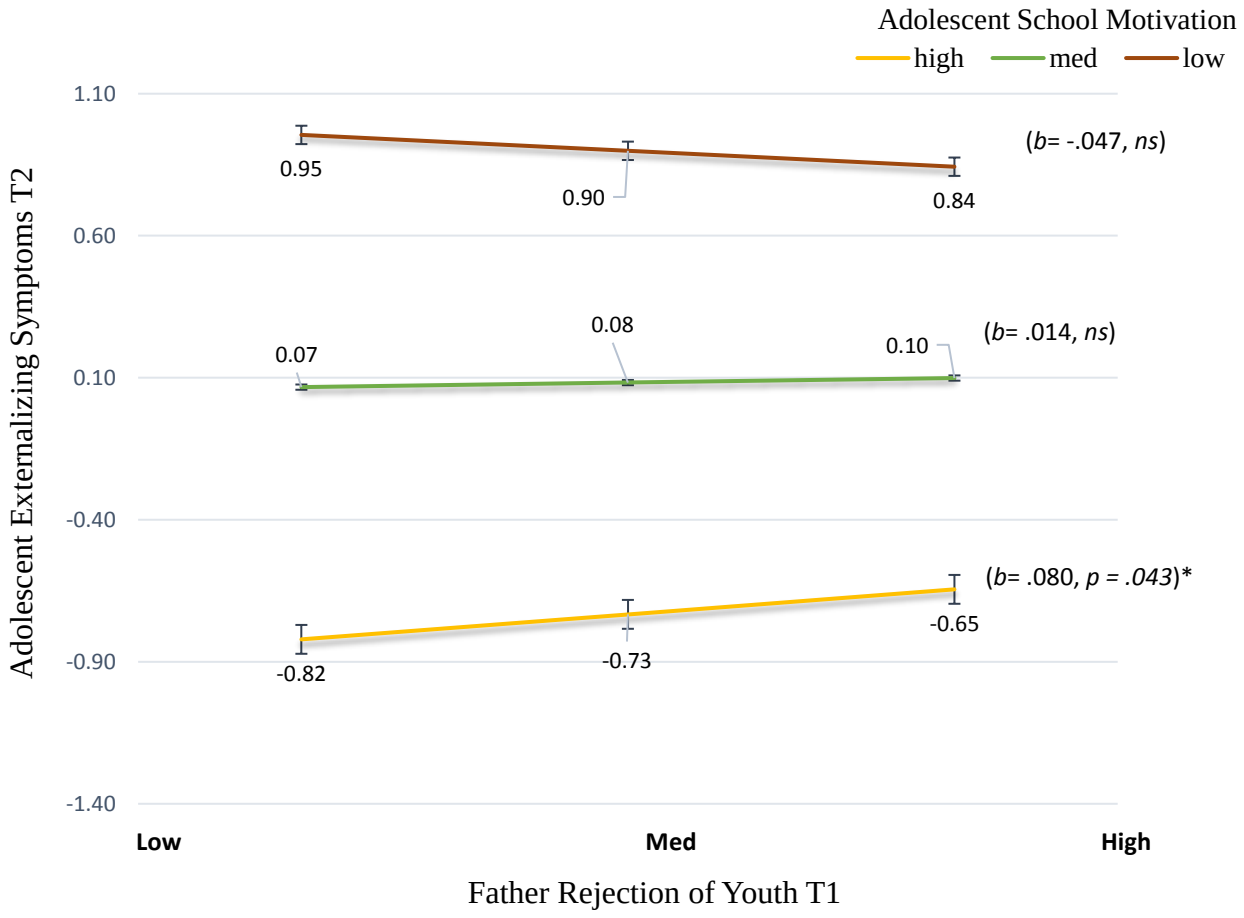

Figure 4. Regression lines showing relation between father rejection and adolescent externalizing symptoms, as moderated by school motivation. Three levels of high, moderate (med), and low were computed for both father rejection of youth and adolescent school motivation using the mean as the moderate value, one standard deviation above the mean as the high value (+1 SD), and one standard deviation below the mean as the low value (-1 SD). b = unstandardized coefficient (i.e., simple slope); Error bars represent 95% confidence intervals.

Aim 3: Explore Aims 1 to 2 for male adolescents, with caution

Aim 1: Identify pathway to adolescent risk: problematic parenting features to adolescent externalizing problems

There were no observed main effects of father or mother parenting features at T1 on male adolescent externalizing problems at T2.

Aim 2: Identify pathway towards adolescent resilience: school achievement motivation; probe the nature of the moderating role of school motivation

Looking within male adolescents at T2, ASAM was strongly negatively correlated with externalizing behavior problems (*n = 177)* with $r = -.83$, $p < .001$. Within T2 for males, results consistently showed a significant effect of ASAM on externalizing behaviors (*ps* < .001). School motivation appeared to act as a protective factor such that youth with higher school motivation manifested lower rates of externalizing behavior in mid-adolescence and those with lower motivation showed higher rates of externalizing problems (unstandardized coefficients ranging from $B = -.749$ to $B = -.754$). See Tables 6 and 7 (though descriptives are provided for females in Table 7, female youth were not examined as a group further because of limited sample availability). Whereas in previous overall findings (when looking at male and female adolescents together), behavioral forms of problematic parenting at T1 did not influence adolescent externalizing problems at T2, directly or indirectly through school motivation, when looking only at males, we do observe an interaction between lax parenting of mothers and ASAM.

More specifically, across two observed problematic parenting features (father psychological control and lax mother parenting) that were associated with greater externalizing problems in male adolescents, males with high school motivation exhibited the lowest rates of externalizing problems related to both problematic parenting features, while youth with low

motivation were at the greatest risk and showed the highest rates of externalizing problems (see Figures 8 and 9).

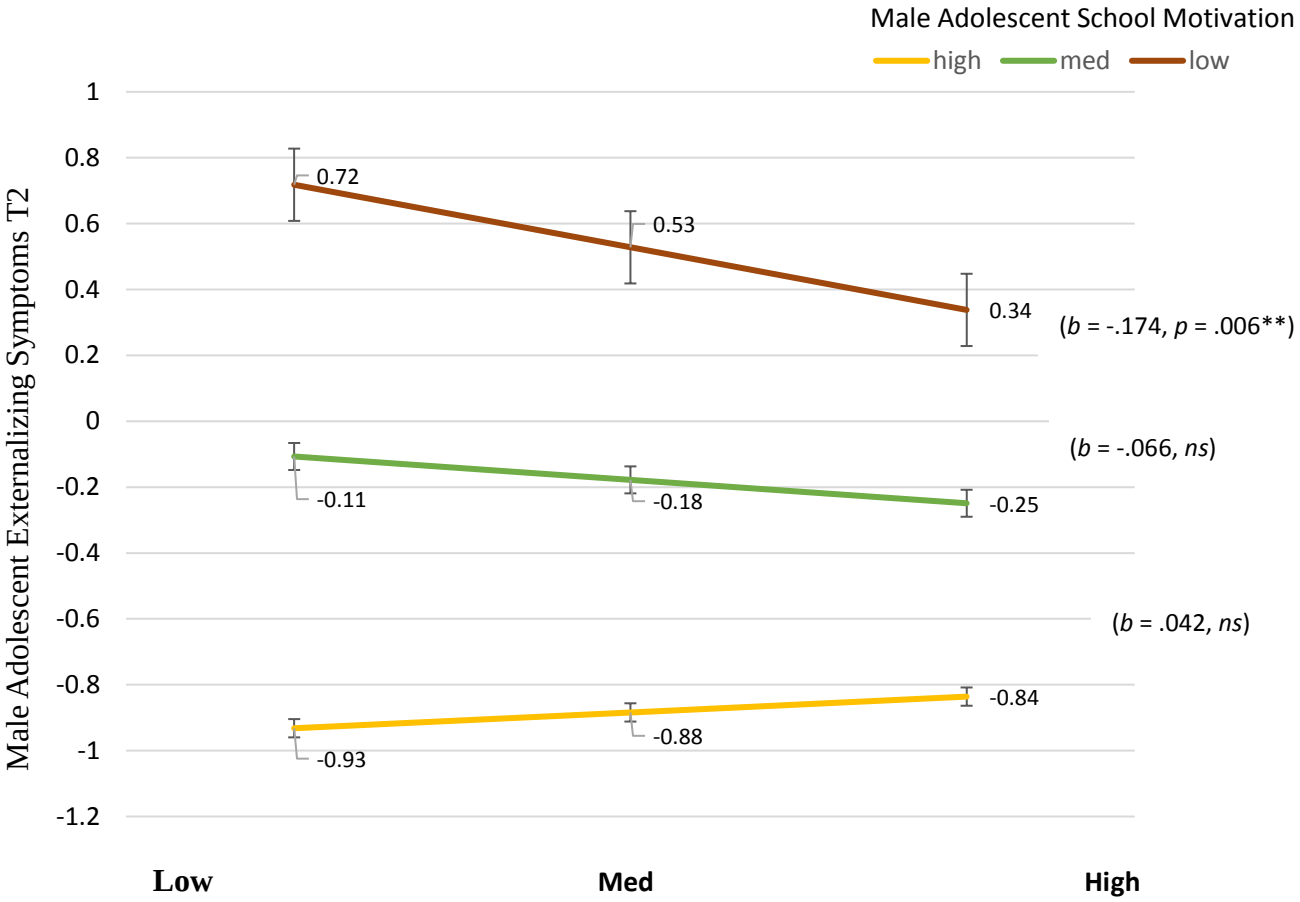

Figure 5. Regression lines showing relation between father respect for male youth psychological autonomy and adolescent externalizing symptoms, as moderated by school motivation. Three levels of high, moderate (med), and low were computed for both father respect for male youth psychological autonomy and adolescent male school motivation using the mean as the moderate value, one standard deviation above the mean as the high value (+1 SD), and one standard deviation below the mean as the low value (-1 SD). b = unstandardized coefficient (i.e., simple slope); Error bars represent 95% confidence intervals.

Looking only within male adolescents, ASAM interacted with father respect for youth psychological autonomy (FRPA: B = .119, p = .008) to predict adolescent externalizing behaviors (See Step 2 in Table 6). Males low in motivation were significantly impacted by FRPA and showed the highest rates of externalizing problems compared to the moderate- and high- motivation male groups (see Figure 5). Plotting simple slopes and testing their significance further confirmed that adolescent males low in school motivation were impacted by FRPA, $t(168) = -2.77$, p = .006. For this group, lower FRPA at T1 was predictive of greater externalizing behaviors at T2, whereas higher T1 FRPA predicted lesser T2 externalizing behaviors.

In comparison to the low-motivation groups, males high or moderate in school motivation appeared unfazed by low FRPA. In these cases, ASAM appeared to function as a protective factor against the deleterious effects of low FRPA. For males with moderate levels of school motivation, FRPA, $t(168) = -.066$, p = .124, did not impact externalizing outcomes in mid-adolescence. Similarly, for highly motivated males, FRPA, $t(168) = .042$, p = .490, had no impact on externalizing behaviors. Male adolescents who experienced low FRPA and had low motivation showed the highest levels of externalizing behaviors in response to this problematic parenting feature. However, their highly or moderately motivated male peers who also experienced low FRPA did not show this effect.

ASAM also interacted with mother behavioral control at T1 to predict externalizing behaviors at T2 (See Step 2 in Table 7) when looking among male adolescents. Males low in motivation were significantly impacted by lax mother behavioral control and showed the highest rates of externalizing behaviors related to this problematic parenting feature compared to males with high or moderate motivation (see Figure 6). Plotting simple slopes and testing

their significance further confirmed that adolescent males low in school motivation were impacted by lax mother behavioral control, $t(169) = -.151$, $p = .032$. For this group, more lax mother parenting at T1 was predictive of greater externalizing behaviors at T2.

In comparison to the low-motivation groups, males high or moderate in school motivation appeared unfazed by lax mother parental control. In these cases, ASAM appeared to function as a protective factor against the deleterious lax mother parenting. For males with moderate levels of school motivation, mother behavioral control, $t(169) = -.060$, $p = .164$, did not impact externalizing outcomes in mid-adolescence. Similarly, for highly motivated males, mother behavioral control, $t(169) = .031$, $p = .601$, had no impact on externalizing behaviors. Male adolescents who experienced lax mother behavioral control and had low motivation showed the highest levels of externalizing behaviors in response to this problematic parenting feature. However, their highly or moderately motivated male peers who also experienced lax mother behavioral control failed to show this effect.

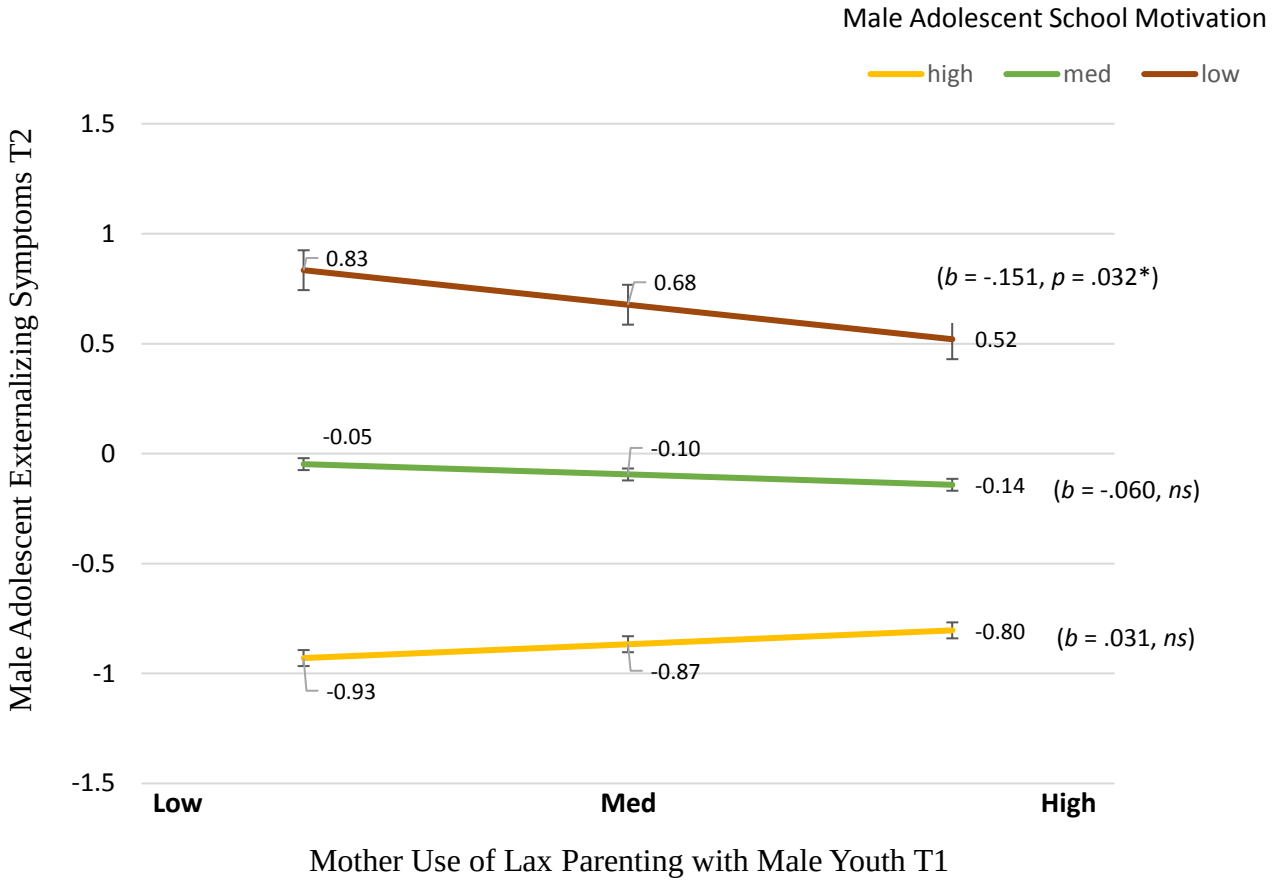

Figure 6. Regression lines showing relation between mother use of lax parenting with male youth and adolescent externalizing symptoms, as moderated by school motivation. Three levels of high, moderate (med), and low were computed for both mother use of lax parenting and adolescent male school motivation using the mean as the moderate value, one standard deviation above the mean as the high value (+1 SD), and one standard deviation below the mean as the low value (-1 SD). b = unstandardized coefficient (i.e., simple slope); Error bars represent 95% confidence intervals.

Table 6

Moderated regression analyses predicting adolescent male externalizing symptoms from father respect for psychological autonomy and adolescent school motivation.

Variable	B	SE B	β
Externalizing symptoms T2			
Step 1			
Adolescent age	0.045	0.041	0.045
Adolescent school learning	-0.088	0.046	-0.088
Household education	-0.05	0.038	-0.005
Household occupation	0.063	0.039	0.061
Father diagnosic status	-0.21	0.066	-0.105**
Father respect for adolescent psychological autonomy T1 (FRAPA)	-0.067	0.035	-0.068*
Adolescent school achievement motivation T2 (ASAM)	-0.749	0.045	-0.759***
Step 2			
Adolescent age	0.063	0.033	0.046
Adolescent school learning T2	-0.1	0.046	-0.028
Household education	-0.005	0.038	0.014
Household occupation	0.055	0.038	0.017
Father diagnosic status	-0.2	0.065	-0.074*
Father respect for adolescent psychological autonomy T1 (FRAPA)	-0.071	0.035	-0.067
Adolescent school achievement motivation T2 (ASAM)	-0.706	0.046	-0.799***
FRAPA X ASAM	0.119	0.034	0.113**

*$p < .05$;
**$p < .01$
***$p < .001$.

Table 7

Summary of hierarchical regression analyses predicting adolescent male externalizing symptoms from mother behavioral control

Variable	B	SE B	β
Externalizing symptoms T2			
Step 1			
Adolescent age	0.034	0.04	0.034
Adolescent school learning T2	-0.093	0.058	-0.093
Household education	-0.009	0.046	-0.008
Household occupation	0.053	0.049	0.051
Father diagnosic status	-0.217	0.081	-0.109**
Mother lax behavioral control T1 (MLBC)	-0.032	0.039	-0.032
Adolescent school achievement motivation T2 (ASAM)	-0.754	0.058	-0.762***
Step 2			
Adolescent age	0.039	0.04	0.039
Adolescent school learning T2	-0.101	0.058	-0.101
Household education	0.001	0.045	0.001
Household occupation	0.049	0.048	0.047
Father diagnosic status	-0.227	0.08	-0.114**
Mother lax behavioral control T1 (MLBC)	-0.047	0.04	-0.047
Adolescent school achievement motivation T2 (ASAM)	-0.772	0.057	-0.781***
MLBC X ASAM	0.11	0.049	0.099*

*$p < .05$;
**$p < .01$
***$p < .001$.

Table 8

Male Adolescent Descriptive Statistics

Variable	N	Mean	*SD*
Age T1	550	11.37	0.93
Mot T2	177	15.24	4.66
HH Educ T1	550	13.9	1.75
HH Occu T1	550	5.19	2.23
Ext Beh T2	231	48.73	8.21
Learn T2	227	4.8	1.72
F Rejection T1	498	23.44	6.1
F Self-center T1	489	12.97	3.04
F Resp Psy Aut T1	498	17.72	3.51
F Resp Psy Sec T1	498	18.32	3.59
F Firm Disc T1	498	19.91	2.44
F Enf Rules T1	498	17.9	2.74
M Rejection T1	501	22.46	5.53
M Self-center T1	501	12.43	2.81
M Resp Psy Aut T1	501	17.37	3.54
M Resp Psy Aut t1	501	18.14	3.58
M Firm Disc T1	501	20.15	2.32
M Enf Rules T1	501	17.62	2.65

Note: T1 = Time 1 (male ages 10-12); T2 = Time 2 (male age 16); T2; Ach Mt T2 = Male achievement motivation T2; HH Educ T1 = Household education at T1; HH Occu T1 = Household occupation at T1; Ext Beh T2 = Male externalizing behavior problems at T2; Learn T2 = Male learning at T2; F Rejection T1 = Father rejection at T1; F Self-center T1 = Father parenting self-centeredness at T1; F Resp for psy autonomy = Father respect for male psychological autonomy via low guilt induction at T1; F Respect for psy security = Father respect for male psychological security via low anxiety installation at T1; F Firm Disc T1 = Father use of firm discipline in parenting at T1; F Enforcing Rules T1 = Mother enforcing rules in parenting at T1; M Rejection T1 = Mother rejection at T1; M Self-center T1 = Mother parenting self-centeredness at T1; M Resp for psy autonomy = Mother respect for male psychological autonomy via low guilt induction at T1; M Respect for psy security = Mother respect for male psychological security via low anxiety installation at T1; M Firm Disc T1 = Mother use of firm discipline in parenting at T1; M Enforcing Rules T1 = Mother enforcing rules in parenting at T1.

Table 9

Female Adolescent Descriptive Statistics

Variable	N	Mean	*SD*
Age T1	225	11.54	0.87
Mot T2	66	17.17	2.94
HH Educ T1	224	14.11	1.96
HH Occu T1	224	5.25	2.45
Ext Beh T2	106	48.9	6.57
Learn T2	105	5.13	1.56
F Rejection T1	190	22.48	6.14
F Self-center T1	190	12.88	3.4
F Resp Psy Aut T1	190	19.22	3.12
F Resp Psy Sec T1	190	19.58	3.05
F Lax Disc T1	190	19.7	2.37
F Enf Rules T1	190	17.59	2.68
M Rejection T1	190	20.98	5.07
M Self-center T1	190	11.79	2.88
M Resp Psy Aut T1	190	18.76	3.3
M Resp Psy Sec T1	190	19.41	3
M Firm Disc T1	190	19.94	2.33
M Enf Rules T1	190	17.25	2.48

Note: T1 = Time 1 (female ages 10-12); T2 = Time 2 (female age 16); T2; Ach Mt T2 = Female achievement motivation T2; HH Educ T1 = Household education at T1; HH Occu T1 = Household occupation at T1; Ext Beh T2 = Female externalizing behavior problems at T2; Learn T2 = Female learning at T2; F Rejection T1 = Father rejection at T1; F Self-center T1 = Father parenting self-centeredness at T1; F Resp for psy autonomy = Father respect for female psychological autonomy via low guilt induction at T1; F Respect for psy security = Father respect for female psychological security via low anxiety installation at T1; F Firm Disc T1 = Father use of firm discipline in parenting at T1; F Enforcing Rules T1 = Mother enforcing rules in parenting at T1; M Rejection T1 = Mother rejection at T1; M Self-center T1 = Mother parenting self-centeredness at T1; M Resp for psy autonomy = Mother respect for female psychological autonomy via low guilt induction at T1; M Respect for psy security = Mother respect for female psychological security via low anxiety installation at T1; M Firm Disc T1 = Mother use of firm discipline in parenting at T1; M Enforcing Rules T1 = Mother enforcing rules in parenting at T1.

CHAPTER 4

DISCUSSION

Results Overview

Results showed that specific features of parenting experienced in pre-adolescence, between the ages of 10 and 12 (T1), predicted externalizing behavior in mid-adolescence at age 16 (T2). In addition, significant main effects of school motivation on adolescent externalizing behavior were robustly observed. When looking at the full study sample (male and female youth together), psychological and emotional features of parenting, but not behavioral interacted with school motivation to influence adolescent externalizing outcomes. When looking solely at male adolescents, psychological and behavioral features of parenting, but not emotional, impacted externalizing behavior by interacting with school motivation to influence this outcome.

Main effect of father psychological control on adolescent externalizing problems

The sole observed direct path from problematic parenting to adolescent externalizing behavior (controlling for adolescent age, gender, family SES, father diagnostic status, adolescent T2 school motivation, and adolescent T2 school learning) was that path from father respect for youth psychological autonomy to adolescent externalizing behavior in the overall study sample. Low levels of father respect for youth psychological autonomy (high psychological control) was associated with greater externalizing problems. Psychologically controlling fathers allow lower levels of psychological autonomy and independence for their children, expecting that their children exist very much in their shadow. This often leads to youth acting out behaviorally (i.e. breaking rules at school, breaking laws, and associated with similarly delinquent peers) in an

attempt to gain feelings of autonomy that they are not able to access internally, due to intrusion into their psychological lives (Soenens et al., 2008).

The dearth of evidence for all but one direct path from parenting features to adolescent externalizing behavior is very likely due to limitations with the CEDAR study regarding missing data on the outcome measure. This is a strong possibility given the previous abundance of evidence for the role of parents in their children's behavioral outcomes, cited earlier in this dissertation. The measure used to assess the outcome, adolescent externalizing behavior was the Child Behavior Checklist-Teacher Report Form (CBCL-TRF), which involved teacher observation and reports of student behavior within their classrooms. Unfortunately, missing data on this measure was extensive (337 data points available in a greater sample of 775 adolescents; M = 231, F = 106) and the present study is likely under-powered for determining the direct path from parenting features to adolescent externalizing behavior. While parent CBCL reports were available and more abundant, the teacher-report version was used in order to avoid other possibly more egregious study limitations and confounds that would result from using parent reports since parenting was also the risk factor being assessed.

While the observation of direct effects of parenting on adolescent externalizing behavior was limited, greater indirect effects were observed. As expected, the extent to which psychological, emotional, and behavioral features of problematic parenting experienced in pre-adolescence impacted youth behaviors in mid-adolescence depended on the level of school motivation held by adolescents at that time. Adolescents with low school motivation showed the highest level of externalizing problems compared to those with moderate or high motivation in all models. Below I discuss these findings in more detail.

Moderating effect of school motivation on the relation between parent psychological control and adolescent externalizing problems. One path for reaching resilience for adolescents who experience low respect for their psychological autonomy by their parents involves motivation in the school context. Adolescents with low school motivation were significantly impacted by both low father and mother respect for their psychological autonomy and showed higher externalizing symptoms related to these parenting features. In comparison, youth who similarly experienced low mother or father respect for their psychological autonomy or high father self-centeredness but were high or moderate in school motivation did not show this harmful effect. This pattern was also observed in the male-only sample, though only for father parenting---low father respect for male children's psychology autonomy was associated with greater externalizing problems in adolescence and only those males low in motivation were impacted.

There are some key possibilities why school achievement motivation may function as a protective mechanism for adolescents in the face of father and mother psychological control and why low motivation places youth at elevated risk for poor behavioral outcomes. In the school setting, motivation, learning and applying this learning is adaptive. At the forefront of a teacher's mission is to effectively instruct on topics in the curriculum. Students are praised for their effort and rewarded for the success of that effort, both directly by teacher praise and grades and indirectly by the environment's response to their efforts (for example, understanding how to complete one part of a task effectively allows you to move forward to continue to make progress, sometimes with peers, until that work is complete). All efforts directed towards the achievement of a task, including attention to and retention of information in order to achieve a goal, is

anchored in mastery, or the basic drive to exert a certain level of control over one's environment or outcome (Martin, 2001; Patrick et al., 1993).

Mastery motivation has been identified as the most critical adaptive mechanism that underpins the resilience process (Masten, 2011; 2014). The factor of control that mastery allows is fundamental to individuals' experiences in their environment and the motivation to influence that environment. This can help us to understand *why* motivation is so strongly negatively correlated with adolescent externalizing problems and why it moderates the otherwise harmful influence of parent psychological control. It may not be the motivation *per se* that is critical for resilience, but what the motivation allows for in terms of individuals' cognitive framing of an experience and their role or position within that experience. Motivation allows for the crucial feeling of control and agency in an environment, and, for youth experiencing lack of control in their home environments, the value of this feeling of control in the school context can be understood. Lacking this feeling of control in school means lacking certainty as to whether one can avoid failure in this achievement context (Connell, 1985; Martin, 2001). Youth who are made to feel guilty by their parents for any attempt at psychological autonomy (as they were in the present study) also face great uncertainty, about whether they will *ever* be free to be themselves and to have their own, separate lives. Results suggest double jeopardy for behavioral wellbeing for youth who face both uncertainties, at home and school.

The school context has been heralded as an excellent opportunity for enacting positive change for potentially at-risk youth because in certain cases it allows for the removal of some risks, temporarily but regularly, and for an extended amount of time (approximately 1,179 hours per year). In addition to the critical exercise of control that the school context can provide through motivation, it also includes the other crucial ingredient for promoting resilience: social

support from teachers, counselors, staff, and peers. Motivation may be the conduit through which social support can manifest. Alternatively, social support may also lead to motivation. Nonetheless, social support in school may be especially beneficial for adolescents experiencing psychologically controlling parenting because it can provide a contrast to the intrusive and manipulative socialization of parent psychological control.

Moderating effect of school motivation on the relation between father self-centeredness and adolescent externalizing problems. In this next set of findings, the pattern of low-motivation adolescents showing the highest externalizing symptoms out of moderate- and high-motivation adolescents continued. However, there were also results that were not quite expected. Father self-centeredness significantly impacted low-motivation adolescents; however, greater father self-centeredness was predictive of fewer externalizing behaviors for this group. Father self-centeredness in parenting manifests as largely a focus on the feelings and needs of the father in the parenting dynamic rather than a focus on the child's concerns or needs. Self-centered parenting also tends to involve lower parent involvement or interest in their child's school experiences, struggles and successes. The opposite of this specific parent-centered approach is child-centered parenting. Here the parent's focus is on the needs, feelings and concerns of the child. These child-centered parents tend to be involved in their child's school experiences and performance.

The observed effect for low-motivation youth may be linked to fathers with problematic parenting generally being less involved in school. Previous research shows that children of problematic parenting fare better in behavioral outcomes and school performance when their parents are less involved in their children's school life rather than more involved (Robinson & Harris, 2014). Low-motivation adolescents showed significantly higher externalizing symptoms

the more child-centered (less self-centered) their father was and fewer symptoms the more self-centered their father's parenting was. Low-motivation youth experiences of child-centered father parenting might be qualitatively different from their moderate- or high-motivation peers experience of this ostensibly positive parenting feature. For low-motivation adolescents, father child-centered parenting might backfire for adolescent externalizing problems as it appeared to in this study. Instead, youth low in school motivation may benefit from less father attention and more compartmentalization of their home and school lives. Fathers of low-motivation youth might have in some ways become less involved with these youth over time if they observed their child's behavior did not improve with greater attention. Parent-child influences are reciprocal and for parents of youth experiencing behavioral challenges, the child comes to shape the parents' behavior. After repeated conflict it is not uncommon for the parent to relent both in their attempts at involvement with their child and at successfully exercising discipline.

Moderating effect of school motivation on relation between father rejection and adolescent externalizing problems. In this next finding, the pattern of low-motivation adolescents showing the highest externalizing symptoms out of moderate- and high-motivation adolescents continued. However, there were also results that were not quite expected. As opposed to adolescents low in school motivation being impacted by father rejection, youth high in motivation showed this effect. Specifically, these adolescents were impacted by father rejection whereas adolescents low or moderate in motivation were not impacted significantly by father rejection. While high- and moderate- motivation youth showed fewer externalizing behaviors than low-motivation youth overall, it was high-motivation youth whose externalizing symptoms significantly increased as father rejection increased. This effect was not observed for low- or moderate- motivation adolescents.

Father rejection involves expressions of disapproval towards the child. This disapproval can include statements explicitly expressing this sentiment along with implicit behavior indicating displeasure with or apathy towards the child. Apathy involves lack of involvement with the child or declination towards possibilities for involvement. This breakdown of parental rejection can help in understanding how this feature of parenting is likely to impact adolescent behavioral outcomes. On one hand, rejection is a type of problematic parenting behavior. On the other hand, while its impact is statistically significant, rejection does not appear to be the most detrimental parenting feature in the context of the present study given that its impact is on the lowest externalizing-risk group of adolescents. It is possible that highly motivated adolescents are in fact more susceptible to influence from father rejection because they are more concerned with seeking and gaining that approval in the first place, more-so than their low or moderately motivated peers. Highly motivated youth might observe that their efforts to avoid externalizing problems are not being recognized, and so, are in vain. This might result in youth becoming reactive to the continuation of father rejection, even when they may be achieving and working hard in school. This in turn might lead to an increase in externalizing behavior and a broader sense of discouragement, potentially explaining this finding.

No paths from parent behavioral control to adolescent externalizing problems in full sample; path from mother behavioral control to adolescent male externalizing problems

Variability in school motivation did not differentiate any impact of parental behavioral control at T1 on adolescent externalizing behaviors at T2. While a moderation effect of school motivation was observed for the influence of psychological and emotional forms of problematic parenting on adolescent externalizing problems in the full sample, this effect was not observed in

the full sample for either of the two potentially harmful dimensions of behavioral subfeatures of parenting, lax discipline and nonenforcement of rules.

This finding may be related to the observation that behavioral features of parenting might differ from emotional or psychological features (Petit, Laird, Dodge, Bates, & Criss, 2009; Steinberg, 1990) not only in terms of their substance but in terms of relative stability versus variability over time. While behavioral features of parenting (such as behavioral control) will vary over the course of childhood and adolescence, the fundamental nature of psychological or emotional features of parenting in comparison tend to remain stable over the course of development (e.x., Luyckx, Soenens, Vansteenkiste, Goossens & Bersonsky, 2007). Therefore, parenting features such as psychological control or rejection experienced between age 10 and 12 might be more demonstrably related to later adolescent behavioral outcomes (whether directly, or indirectly through a construct like motivation level) at age 16 than parental behavioral control.

Parent behavioral control is a necessary and important aspect of parenting, is dynamic and varies appropriately across child development (Barber, Stolz, Olsen, Collins, Burchinal, 2005). Obviously, infants and young children are dependent on their parents to live and parents exert a high amount of behavioral control over their lives. In comparison, the pre-adolescent to adolescent years see a shift in the level parent behavioral control, and typically involve a push and pull between youth and parents regarding how much behavioral control versus autonomy should exist. During adolescence, youth become more motivated to exist separately from their parents and families (some for the first time), and as a result, there can be conflict with parents (Collins, 1998; Silverberg & Steinberg, 1987; Steinberg, 1990; 2001). Hormonal changes and puberty during this time add another layer of complexity to parent and youth relationships from pre-adolescence to adolescence. In addition to hormonal changes taking place across these years,

extensive cognitive changes are also at play. Steinberg (2014) discusses the period of pre-adolescence to early adulthood as the period of "redevelopment". During this time, there is significant brain plasticity and rapid cognitive development is underway. By age 16 the prefrontal cortex becomes more organized and neuronal pathways are strengthened, making youth susceptible to greater influence from their environments and experiences. Clearly then, the period of development between ages 10 and 12 (when youth in the present study reported on parenting features) is extremely different than that at age 16 years of age, cognitively, socially and emotionally. Given these differences and changes that occur between these developmental stages, it may be more clear why pre-adolescent reports of behavioral parenting features in the full sample did not predict, nor in isolation or interaction, adolescent externalizing problems four to six years later.

There was however an effect of one subfeature of behavioral control when looking only at male adolescents. Mother lax parenting at T1 was associated with greater male externalizing problems at T2. Lax mother parenting impacted only males with low school motivation and did not have any influence on males moderate or high in motivation. Previous work has shown that male youth tend to be more impacted by parental attempts at behavioral control whereas females are more impacted by psychological control (e.g., Hunter, Barber & Stolz, 2015). Variations in parent behavioral control are more associated with externalizing behaviors generally, whereas psychological control has been seen in some studies to be more associated with internalizing problems (Barber, Olsen, & Shagle, 1994). This can be explained by the tendency to seek to escape distress or to sooth ourselves when being obstructed from experiencing a full range of emotions of behaviors, but because of the interference taking place, these desires manifest as maladaptive behaviors (McElroy & Rodriguez, 2008). Male youth are already more susceptible

to externalizing problems in adolescence, particularly delinquent acts. It would follow then in addition to this, having a mother who exercises lax behavioral control, when control is attempted (as lax parents also tend to be inconsistent), would lead to even more struggle for adolescent males in this area. These displayed problematic behaviors might also subconsciously be related to a desire by the male youth to be seen by or attended to by the mother.

Limitations, Strengths, and Future Directions

Like most psychological phenomenon, resilience is not a feature that can be measured directly. Instead, as researchers we can measure correlates of resilience or protective factors that might help to steer youth towards resilience. This study involved secondary data analysis, with the original CEDAR study and associated data collection seeking to longitudinally measure the biobehavioral and environmental risks associated with the development and course of substance use disorder, from ages 10 to 30. Though these goals were not those of the present study, these data contained a treasure trove of possibilities for exploration of precise, potentially resilience-facilitative mechanisms, in the lives of youth facing environmental risks during sensitive periods of development.

In working with the CEDAR data, I identified a potential form of adversity in parenting features that have historically been associate with poor adolescent behavioral outcomes, along with a protective mechanism that might buffer the predicted harmful effects of risks in parenting. Measurement of adversity was based on youth ratings of parenting features and the statistical association among these features with poor behavioral outcomes. Identification of the protective factor was based on teacher-reports of correlates of achievement motivation in student behaviors in the school context. Individuals represent their view of themselves in their interactions with others. In the school context, this involves teachers and peers. It is a possibility that teachers

were susceptible to biases that students had regarding their own motivation, as would likely be reflected in student behaviors or attitudes (McClelland, Koestner, & Weinberger, 1989).

A measure of school motivation was constructed that involved teacher ratings of students' motivation-related behaviors. Though Chronback's alpha for the school achievement motivation measure used was equal to .93, it is still necessary to approach the study moderation findings with caution, given the novel construction of this measure using available teacher reports of student behavior. Most critically, the strong, negative correlation between school motivation and externalizing behaviors raises concerns regarding the overlap in features between these measures, in opposite directions. It is possible that given the items that made up the motivation measure, it functioned as a mere mirror to the externalizing behavior measure. Thus, the appropriateness of the motivation measure as used in the present study is in question. Future studies should assess the internal consistency and validity of this motivation measure in relation to the particular latent construct into which it is meant to give insight, respective to the specific research program under development. However, even prior to this, conceptual design and goals ought to be considered in future studies in order to determine the nature and nuances of the type of motivation a researcher is seeking to measure. In addition, it is possible that measurement of externalizing behaviors in the school context confounds the study findings. Given that the school environment might act as a regularity agent in and of itself of adolescent behaviors, observation of these behaviors as the outcome of interest might be hampered. Given this, measurement of externalizing behaviors outside of the school context, where the moderating role of motivation is also being assessed, would have presented a more elegant study design and more reliable findings.

Educational psychology is a critically important field to consult for conducting narrowly focused, efficacious motivation research. Work in this field provides insight into conclusions that can or cannot be drawn based on the nature of and manner by which motivation was assessed (Brunstein & Hower, 2002; Hangen & Elliott, 2016; McClelland et al., 1989). This work has shown that there are unique motivational constructs which assess different, but equally important, aspects of motivation as a multifaceted construct (Brunstein & Hower, 2002; Hangen & Elliott, 2016; McClelland et al., 1989). The ideal course of action regarding measurement of adolescent school achievement motivation in the present study is not altogether clear. While the present study assessed other-attributed (i.e., teacher-attributed) motivation of adolescents, measuring adolescent implicit motivation might have been optimal, as this type of motivation may better map onto the nature of adaptive achievement orientations and mechanisms in action (McClelland & Pion, 1983; Masten, 2014).

An additional limitation was preset with the disproportionate gender distribution of the present study, such that male adolescents outnumbered female adolescents by a factor of more than two to one. This along with missing data, across six years on the variables of interest (in particular on the measure used to assess adolescent externalizing behaviors at T2) reduced the final sample size (see Tables 1 for sample sizes associated with the correlation table among study variables, and Tables 2 and 3 for descriptive statistics for male and female adolescents, separately). In order to adequately capture the sex differences that exist in parenting, enough participants should be recruited such that attrition and diminished participation over a long span of time is taken into account. In this way, final sample size would be sufficiently representative of the population of interest, and the dynamics under study can be assessed with adequate analytical power.

Last, type 1 error was not controlled for in the present study because of its exploratory nature. However, given the multiple regression analyses that were conducted simultaneously, the potential for false positives in the findings is elevated. Therefore, a Bonferroni correction would ideally have been applied in order to decrease the alpha value and account for the multiple analyses being conducted.

Conclusions and Implications

Even for adolescents who are fortunate to experience competent parenting that allows for psychological autonomy, is accepting, and provides appropriate discipline, it is a story as old as time that youth and parents will encounter relational challenges along the way. However, for youth who are not afforded with such parental assets and have low school achievement motivation, the potential for poor behavioral outcomes is significantly elevated. Study findings suggest that during pre-adolescence, emotional and psychological features of parenting rather than behavioral features pose the greatest lasting harm for future behavioral outcomes during mid-adolescence. Assessing motivation level in the school setting revealed important differences in how separate features of parenting come to influence the development of externalizing problems during the sensitive period of mid-adolescence. During mid-adolescence, the harnessing of motivation centered in the school context is adaptive and can promote resilience for youth at risk for poor behavioral outcomes, related to parenting that is psychologically controlling, rejecting or lax.

Further basic research is needed in order to better understand the construct of motivation in school, the roles that feelings of control, mastery, autonomy, and social support play in this construction and how each of these features uniquely and together mitigate the negative influence of individual problematic parenting features. More broadly and critically however, the

fields of educational psychology and psychology remain in poor communication and low consensus when it comes to basic understandings of the differences between the main types of person-focused motivation, implicit and explicit. Until these gaps in communication and collaboration are addressed, the efficacy of motivation research as a whole will be substantially limited. This collaborative work should assess the development of school motivation over time from childhood to early adulthood while also measuring family and parent risk factors, using robust measures that have demonstrated good validity and reliability.

Insight gleaned from this study and other basic research can provide the foundation for applied research and the design of easily implementable interventions in the school setting, focused on fostering motivational frameworks in adolescents who may be facing personal parental challenges outside of school. The longitudinal methodology of this study allows for understanding of the direction of the effect between problematic parenting features and adolescent behavior problems. Further, in longitudinally examining the relation between adolescent externalizing behaviors and distinct features of parenting, this study allows for a predicative model of these associations over time. The design also permits examination of the impact of individual parenting features on individual adolescent outcomes. Previous parenting research has noted that while parenting styles have been a valuable tool for encapsulating often related characteristics of parents into coherent schemas, they have limitations for drawing connections between specific parenting features and individual youth outcomes. By focusing on the most critical, separate components of Western parenting (Armentrout & Burger, 1972; Steinberg, 2014) it was possible to assess which of these features are most consequential for a specific behavioral outcome, externalizing problems.

This study identifies one adaptive mechanism that can be leveraged in the school setting to positively impact youth facing adversity at home. The sensitive period during which school motivation was assessed in this study is perhaps its greatest strength. It is at around 16 years of age that the greatest possibilities exist for the school setting to shape youth cognitive development, for better or worse. Steinberg (2014) discusses the period of pre-adolescence to early adulthood as the period of "redevelopment". This period of development is one of extensive cognitive change, where by 16 years of age the prefrontal cortex becomes more organized and neuronal pathways are strengthened. Because this period of development observes better decision-making and problem solving than any other time previously, the likelihood of observing substantial change in adolescent school motivation, alone or in interaction with other variables, is greatest. Interventions seeking to promote and support the development of school motivation to mitigate the effect of harmful influences outside of school might be most efficacious during this particular window of time in adolescent development.

This study, though extremely limited, provides a good step towards beginning to understand when and how a key system of adaptivity in the school context might be leveraged to protect youth against negative behavioral outcomes during sensitive periods of development. Study findings reveal that during mid-adolescence, school motivation is a promising force of protection for youth in the face of parenting that threatens behavioral wellbeing. This study identifies one adaptive mechanism that can be leveraged in the school setting to positively impact youth facing adversity. The sensitive period during which school motivation was assessed in this study is perhaps its greatest strength. It is at around 16 years of age that the greatest possibilities exist for the school setting to shape youth cognitive development, for better or worse. Steinberg (2014) discusses the period of pre-adolescence to early adulthood as the period

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