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Applying An Ecological Model To Predict Adolescent Academic Achievement

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DEDICATION

There are no words for your constant companionship, your love, your patience. You believed in me and supported me from the very beginning, and I will always be thankful for that.

Therefore, I dedicate this work to my husband

Bhanu Murthy Anagurthi,

and to my children Sandhya, Vindhya, and Akash,

who I know will follow their dreams just as I did,

and Anna Mentier,

whom I cannot thank enough for the generous gift of her friendship.

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CHAPTER 1 - INTRODUCTION

Establishing scientific paradigms that delineate the structure and development of child behavior within internal and external systems has long been a common research agenda. Over time, researchers have come to the understanding that *the context* is an intricately spun web of connections progressively becoming more complex as children merge into multiple contexts, including school. Therefore, schools provide optimal opportunities to observe and direct child behaviors.

Good academic performance and positive academic behaviors have been found directly related to successful developmental trajectories. Poor academic behaviors have been found to lead to less than optimal academic performance. Poor academic performance may also lead to academic failure, poor adjustment, and poor outcomes later in life. Poor academic achievement has been linked directly to high-school drop-out rates (Atkinson et al., 2015). Further, good academic achievement in high school is linked to life-long health outcomes as it is related to the ability to maintain productive work and adequate income to support self and a prospective family (Hahn et al., 2015; Veldman et al., 2015). Unfortunately, current national high school drop-out rates in the USA lie at 13.5 % (National Center for Education Statistics, 2015), and have been associated with concurrent and subsequent risk behavior in youths (Atkinson et al., 2015), such as increased likelihood of involvement with the judicial systems (Welsh & Harding, 2015). Lowered physical and mental health status also part of this interrelation (Veldman et al., 2015). One can see success in school, and later outcomes in life are intricately linked.

Poor academic outcomes cost society innumerable amounts in tax dollars. In connection with the reduction in living standards and therefore access to health care and other important resources they also cost thousands of lives every year. For instance, suicide and homicide are the second and third leading causes of deaths in teens aged 15 to 19 years (Centers for Disease

Control and Prevention, 2013). Youth crimes cost the United States 21 billion dollars annually (Tyler, Ziedenberg, & Lotke, 2006). Clearly, there is a need to better understand how to create positive academic paths and to reduce the risk behaviors that frequently interfere.

Theoretical Model

Several models have been proposed to understand the different layers of youth ecology that promote growth and inhibit or limit negative outcomes. One of the most popular models remains Uri Bronfenbrenner's (2009) *ecological systems perspective*. He ascribes to the view that the environment of each and every individual in a society is layered in distinct patterns that can be individually observed. The interaction between layers can be operationalized in terms of how the individuals living in the particular environment co-exist and make use of the resources presented in the environment. Individuals must also optimize responses to the challenges they are faced with to function well (Bronfenbrenner, 2009). A key element of this theory is that all individuals who exist within the layers of the system are presented with *dynamic possibilities* (Bronfenbrenner, 2009). Uri Bronfenbrenner's bioecological systems theory (1998) extends from the classical dyad (parent-child) to the overall context of a child's growth. Bronfenbrenner's theory poses that particular supportive or disruptive factors in the environment can either enhance the well-being and functioning of a child or corrupt development over time. The immediate setting of a person is called the *microsystem* and includes home environment, school environment, some neighborhood settings (playground, library, e.g.), all of which directly interacts with one's intrapersonal variables. A second layer is called the *mesosystem*, which involves interactions between microsystem variables (e.g., parent-work communication, parent-school communication). The *exosytem* may refer to the location of a home, school environment and resources, and society and rules and policies that govern behavior (Bronfenbrenner, 2009). These systems are additionally interconnected and organized through patterns referred to as the

macrosystem. They capture how a culture's policies may affect an individual's growth on multiple levels of his or her life (Bronfenbrenner, 2009). Various theoretically and empirically grounded factors from several life contexts were carefully selected for inclusion in the current study. These are identified in succession next and the rationale for their inclusion is explained.

Intrapersonal Predictors of Achievement

Academic self-efficacy. Bandura (1993) stated that responses to environmental influences in individuals can be mediated through self-efficacy. Belief of one's capability to exercise control over one's environment can impact how a person will feel, think, engage, and react to a specific event. Academic self-efficacy specifically describes a pupil's beliefs of how well they can perform on a certain subject or academic areas. Self-efficacy is generally better understood when kept domain specific as opposed to generalization over several behaviors (Valentine, DuBois, & Cooper, 2004). Self-efficacy and academic efficacy have been found to be two of the strongest predictors of academic achievement throughout the literature (Chang & Chien, 2015; Bandura, Schunk & Zimmerman, 2012; Marsh & Seaton, 2013) and correlates highly with college achievement (Chemers et al., 2001; Gore, 2006; Multon, Brown, & Lent, 1991; Zajacova, Lynch, & Espenshade, 2005). Bandura (1993) added that teachers' beliefs about their students and school environmental factors also have significant impacts on the student's academic performance.

Academic engagement. Student engagement has also been identified as a predictor of academic achievement, while non-present or low academic engagement in high school has been identified as a risk factor for drop-out and future risk behaviors (Finn & Zimmer, 2012; Dotterer & Lowe, 2011; Wang & Eccles, 2012). Academic engagement refers to students' behaviors that add to readiness and preparedness to learn, such as, completing assignments, attending classes, and being overall attentive and invested in the learning content (Finn & Zimmer, 2012). Some

studies found that self-efficacy may have a moderating effect on student engagement, in that students with higher self-efficacy tended to be more engaged in academic tasks (Chang & Chien, 2015). Student academic engagement has also been linked to classroom climates, and in one study was suggested as a mediator between academic achievement and classroom climate (Reyes et al., 2012).

Intrinsic value for education. Motivation to learn has also been associated with academic achievement. Adaptive motivational beliefs have led to increased academic performance (Green et al., 2012; Pintrich & DeGroot, 1999). As such, motivation is often described throughout literature as an individual's likelihood to find academic materials meaningful and worthwhile, and relates to active efforts to maximize the benefits of the learning activity (Brophy, 2004). Motivation also relates clearly to self-efficacy. Students who believe that they are capable and well equipped to accomplish a task are expected to be more likely to succeed and will be motivated to put forth appropriate effort and persistence (Mega, Ronconi & DeBeni, 2014). Prior research also suggests that motivational beliefs may be mediated by engagement (Green et al. 2012). A longitudinal study by Alivernini and Lucidi (2011) found that low motivation and poor support systems within the child's environment accounted for higher high school dropout rates.

Self-regulation in goal-directed behavior. Researchers have also suggested that adolescence is a critical period of mental and physical growth, as teens are required to commit to long-term goals while having to deny instant gratification at the same time. Thus, greater levels of self-control and goal-directed action become important skills to avoid risks and achieve future academic goals (Rhodes & Rhodes, 2009; Thompson, 2012). Bouffard, Boisvert, Vezeau, & Larouche (1995), posited that goal orientation matters in students and related to higher overall GPA. Another study demonstrated that constructive use of selective strategies, optimization

strategies, and compensation strategies regarding goal-directed action improved positive outcomes in youth above the age of twelve. These positive outcomes included decreases in problem behavior, increased time spent on-task in educational settings, better grades, and more completed homework assignment (Gestsdottier & Lerner, 2007). Therefore, students that have developed systematic ways of "thinking through a problem" may be more likely to grow into productive and well-adjusted students that can work efficiently, turn in assignments in a timely manner, seek out help when needed, and stay away from problem situations.

Microsystem Predictors of Achievement

Parents educational attitudes and behaviors. The literature on the effects of parental practices, parental involvement, and parental attitudes towards the education of their children has accumulated overwhelming evidence of the important roles parents play regarding their child's academic success (Dearing, Sibley, & Nguyen; 2015; Watkins & Howard; 2015). Specific parental behaviors can include supporting reading at a very young age, providing help with homework through primary school years, and having a positive attitude towards education themselves (Pomerantz & Monti, 2015). In a longitudinal study by Otter (2014) with 14-year old students, it was also found that parental beliefs and supportive behaviors related to education matter. In another study by Wang and Sheikh-Khalil (2014), academic achievement of adolescents could be predicted by the level of practical and emotional support parents provided to their children. Thus, parents' behavior and their belief systems seem to be clear predictors of a child's academic achievement, and may even offset adverse factors such as low SES and residing in an impoverished neighborhood.

Peers' academic orientation. The relations between the kind of peers a child associates with and their academic achievement have also been explored in the literature. For instance Conley, Mehta, Stinebrickner, and Stinebrickner (2015) found that when children have friends

that have good study habits and spend the appropriate time studying, their own study habits will be similar to that of their friends' behaviors. Similarly, a recent study found that peer relations have significant effects on academic engagement. This study found that students tend to emulate each other, and if peer-groups are structured in ways consistent with a classroom culture that encourages academics, most students tend to benefit from such interaction (Kindermann & Vollet, 2014). There are theoretical foundations to such relationships. *Social learning theory* emphasizes that children as well as adolescents engage in observational learning, which simply means children observe what happens around them and are very likely to emulate the behaviors they see, especially when it is rewarded (Bandura, 2004, 2009). Learning behaviors evolve and become more sophisticated with maturity. While small children may simply copy a procedure they see performed by an adult, adolescents are able to cognitively represent the action and the thinking of others and may adopt observed actions and values of others (Bandura; 2004, 2009). Therefore, what kind of peer interactions exist and how adults respond (approval of friends versus disapproval) to peer behavior becomes an important factor in an adolescent's development.

School climate. The National School Climate Center (2012) stated that "School climate is based on patterns of people's experiences of school life and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures (p.4)." Children spent a considerable amount of time of their day within schools, if not all day. Researchers have conceptualized schools as the bridge between a child's family and society, and the school context itself is a hierarchical system with interactional processes that shape a child's development not only academically, but socio-emotionally, and behaviorally (Henderson & Mapp, 2002; Bandura, 1994). Evidence shows that students who perceive school climate positively attain better standardized test scores despite multiple challenges at home (Henderson

& Mapp, 2002; Cohen, Thapa, Guffey and Higgins-D'Alessandro , 2013). Improving school climate was also found to be a sound technique in decreasing high school dropout (Brook-Gunn et al., 1997).

Positive school culture includes concepts such as overall positive attitudes towards learning for all students, having a sense of belonging, and feeling connected to the school, and positive relationships with teacher and administrative staff (Youngblade et al., 2006). School climate can be measured in terms of perceived school safety, positive relationships within schools, effective teaching, and good institutional management (Cohen, 2013).

Neighborhood structure. The quality and structure of one's neighborhood can impact mental health and resulting academic achievement among children and adolescents (Harding, 2003). Studies show that academic achievement is not only affected by the quality of schooling but also through interrelation of support networks that are made available in the immediate environment for the child and their family. Such resources can include well kept and safe playgrounds, clubs that offer support and productive peer relationships, and community spaces that are safe and accepting to students from several kinds of nationalities and cultural groups (Yoshikawa, Aber, & Beardslee, 2012). The neighbors' ability to intervene or help out and assure safety and positive relationships between adults and children within and around the immediate home setting of a family may also have some impact (Wells & Evans, 2003).

Smokowski et al. (2014) found that neighborhood problems partially mediated the relationship between poverty and mental health functioning in young adolescents. One recent study that focused on high-achieving students in low-income neighborhoods found that these academically well-equipped students will not apply to colleges after high school despite being well-qualified for admission (Hoxby & Avery, 2012). These students exhibited behavior that is representative of their neighborhood-status rather than their actual achievement-status. The

authors of this study argued that the modeling effects occur among peer relations. Further, neighborhoods have combined deficiencies in positive adult role models, child monitoring, career and employment opportunities, and provide inadequate informal and institutional resources (e.g., library programs, community center sports activities). These issues are co-occurring and create a compounded effect (Ainsworth, 2002).

Socioeconomic status (SES). SES is most closely related to the economic resources a family can provide for children (e.g., home safety, quality of childcare, ability to monitor children), which then has an immediate impact on child development. For example, families with low income tend to have caregivers in place that may have low-quality jobs. Low-quality jobs are those with few benefits, higher physical hazards, higher tedium, and little opportunity for advancement (Perry-Jenkins, Repetti, & Crouter, 2000). This interrelation can negatively affect children's mental and emotional health as well as their academic performance (Jesus, Yoshikawa, & McLoyd, 2006). In all analyses, we controlled for SES.

Mesosystem Predictors of Achievement

Parent-teacher-school communication. It is likely that the interaction between multiple microsystems is indirectly associated with adolescent academic outcomes. The focus in this study is the parent-teacher relationship and the parent-school relationship. Parents who initiate more contact with teachers tend to have kids who do better academically (Hill & Taylor, 2004), and parents who are in contact with principals or school administrative staff tend to have children with higher academic achievement (Moles, 1993; Henderson & Mapp, 2002).

Past research also showed that differences by ethnicity exist. Minority parents are the least likely to initiate communication with a school and are the least likely to respond to communication from school, or volunteer (Sui-Chu, Ho, & Willams, 1996). Research also showed that the frequency of parent-school communication changes as children grow older.

Nevertheless, the general presence of a parent at the school seems to have beneficial effects on school attendance and grades (Grolnick & Slowiaczek, 1994; Moreso, Hill, &Taylor, 2004). Research on this specific topic is relatively new and will be explored in the current study.

Limitations of Prior Research

Few models integrate a broad combination of proximal and distal factors that may maximally explain the development of academic achievement in youth (Dearing, Sibley, & Nguyen, 2015). There seems to be a lack of an integrative model, although many of the models regarding academic achievement seem to overlap on some variables but not others. Henceforth only limited inclusion of system-wide variables exist (Wigfield et al., 2015). The simultaneous inclusion of the wide variety of predictors is scarce despite the fact that researchers acknowledge the multidimensionality of the links between academic achievement and individual student characteristics, various life contexts, and their interactive nature (Green et al., 2012).

Research Questions

Based on the limitations revealed through the empirical literature review, the following research questions were generated. Preliminary analyses determined whether SES, gender, or other demographic variables would be controlled.

1. Do some intrapersonal factors explain variance in academic achievement outcomes more than others?
2. Do some microsystem factors explain variance in academic achievement outcomes more than others?
3. When intrapersonal, microsystem, and mesosystem factors are included hierarchically in one full model, which variables are most predictive of academic achievement?
4. Does school climate moderate the association between SES and a) academic engagement and b) academic achievement?

5. Does school climate moderate the association between neighborhood structure and a) academic engagement and b) academic achievement?

It was expected that intra-individual factors are most predictive of academic achievement, followed by micro- and macrosystem factors. Previous studies found that a student's grades largely depend on motivation and effort (Atkinson, 2015). Macrosystem variables, such as parental educational attitudes and peer attitudes, can also influence engagement, self-regulation, and academic performance (Roebroek & Koning, 2015). Consistent with Bronfenbrenner's ecological model and Bandura's social learning theory, environmental and learning variables interact. For instance, pupils that perceive school as important are likely to have parents that support them and may choose peer support systems that are consistent with their belief systems and future goals. When such students are faced with levels of adversity, they can connect to positive role models and have their needs met in school.

Similarly, a positive school culture may stimulate academic engagement even when parents find it hard to get involved with their child's academics (i.e., stressful work schedules or cultural barriers such as language). One mediation mechanism may be that students become more engaged in positive behaviors when they feel valued as members of the school community, which then improves their academic achievement. Similar mechanisms could involve peer-groups and the overall parents' educational attitudes.

This is important information because interventions may not always be effective on an individual level. However, multiple students' lives can change for the better through school-wide interventions, especially when families are already challenged with issues in their neighborhood or with low SES. Therefore, studies that address factors through multiple systems can help accommodate current needs of students.

CHAPTER 2 - LITERATURE REVIEW

Theoretical Framework

Long-term implications of poor academic achievement. The importance of genes and biological factors cannot be denied in understanding problem behaviors in children, but it is also clear that certain environmental influences will put children and youth at a disadvantage. There are striking differences in the accessibility of interventions to children and their families. Sadly, most children receiving treatment for mental health problems are middle class when ironically mental health problems are overrepresented among the poor (Mash & Barkley, 2014). High school drop-out rates have declined since the 1990's, especially for Hispanics, but of those that did not receive their GED by the age of 24 years, 62% are either unemployed or did not even enter the labor force (National Center for Education Statistics, 2013). Some researchers have even argued that these rates are artificially lowered by setting lower standards for students in so-called *drop-out-factories* (schools where less than 60% of students graduate). Only a few school districts give struggling students the support they need, and offer long-term support for college success and career development (Green, 2005).

More importantly, high-school-dropout places a substantial fiscal burden not only on the individual but also on the rest of society. For instance, there is a substantial gap between students that complete high school and those that drop out in net fiscal contributions (Smith, Taylor, & Smith, 2015). Moreover, males with no GED are 30times more likely to be incarcerated than those that did complete high school. About 42% of individuals without GED will apply for social security benefits and will need food stamps at some point. Additionally, about 60% without a GED either receive low incomes or are considered 'poor'. These numbers alone show the unfortunate life-time trajectories for those individuals who were not able to complete their high school degrees.

The ecological model in the face of risk. Processes that contribute to psychopathology, problem behaviors, or factors that interfere with school, and consequently lowered academic achievement are multifarious. Many researchers now propose a gene-environment correlation to the development of risk (Rutter, 1989; Granic, 2005; Greene, 1994). The combination of chronic and acute stressful life events, less availability of resources, single parent status, low level of employment among many other variables add to the heightened risk status of a child. The underlying mechanisms of the relationship between risk factors and later risk behaviors can operate in direct and indirect ways (Rutter, 1989). While such concepts are not new, they are not yet fully understood. Thus, identifying variables that minimize the development of risk factors which undermine academic achievement and the development of methods to support student's academic achievement must remain salient in research agendas at any cost.

Developmental pathways. The understanding of developmental trajectories and the knowledge of continuities and discontinuities within child development add to the understanding of disorders, risk factors, and intervention studies. The timing and sequences of behavioral and environmental events, growth patterns as well as probabilistic relationships between successive events in youth's lives may be described as a *developmental pathway* (Granic, 2005). Specific examples of developmental pathways regarding academic achievement could be one of a young child struggling with a learning disorder. School climate and parental support systems could ameliorate most of the struggles by offering appropriate interventions and support, through school clubs and after school programs. However if that is not the case the same child may feel easily frustrated with academics, lose interest in school, avoid school, seek out negative peers, involve in other risk behaviors that offer more immediate gratification and may eventually drop out of high school. Patterns and trajectories are multifaceted and interventions tend to be most

effective if they are offered at multiple points within the child's developmental pathway (Masten et. al., 2005).

Not only early, but continuous intervention strategies are important. In a study by Laub and Sampson (1993) it was found through the observation of longitudinal data collected from delinquent and non-delinquent adolescents over more than 30 years, that trajectories are influenced by the accumulation of risk factors *and* the presentation of opportunities for self-determination (i.e. making autonomous decisions, finding a job) as well as social bonding (i.e. meaningful relationships, social groups). Outcomes for each adolescent were influenced by a combination of the above negative and positive factors in unique ways.

Certainly research has come to recognize that reciprocal transactions between the child, its family, and its environment set the tone for these developmental trajectories. In order to understand the youth's context the students' point of view must be included in the research agendas. Data about chronicity, frequency, and individual perceptions of the youth, when collected over multiple contexts add to the understanding of developmental trajectories (e.g. school, home, neighborhood, clubs, and cultural differences). For instance Cambell (1989) and Cicetti and Toth (1997), stated that when observing transactions within ecological systems, assumptions can be made about adaptive and maladaptive development, thus providing the "where" and "when" for effectiveness studies on interventions and the specific benefits to the individual. It is important to recognize that with the ecological framework the child is an ever changing entity, who is shaped by the systems around him or her, but also exerts influence on the systems (e.g. family, siblings, peers) themselves (Friedman, 1995).

Ecological model by Uri Bronfenbrenner. One the most acknowledged and most popular models to conceptualize multiple contexts in a youth's environment remains Uri Bronfenbrenner's (2009) 'Ecological Systems Perspective'. His work is based on several decades

of empirical studies starting in 1870 (Bronfenbrenner, 1994). He introduced his first ecological paradigm in 1974 to support a broader scope of variables to be included in developmental studies including real life contexts of the child.

Bronfenbrenner poses that human development takes place throughout the life course, with processes becoming increasingly more complex because increasingly complex environmental variables are added with increasing age. He named enduring forms of interactions within the immediate environment of an individual as *proximal processes*. The processes in early life are most often between parent-child, child-caregiver, and child-sibling; and involve a large array of activities (e.g. reading, play, discipline, performing complex tasks). These proximal processes vary by strength and direction depending if they are immediate or more remote. The impact of proximal process (such as parenting) and how the ecology of a child matters have been empirically validated over many studies and by many researchers (i.e. Mash & Barkley, 2014; Bronfenbrenner, 2008, 2009; Masten et. al., 2009), and will be discussed in this study only to a limited degree.

Perhaps the most important theoretical point made that is relevant for this particular study, is that for outcomes of developmental growth in regards to mental ability, academic achievement, and social skills, the proximal processes are having a great deal of influence on the child's development when environments are advantageous and stable (Mash & Barkley, 2014; Bronfenbrenner, 2008). In contrast, when environments are disadvantageous, then the same level of proximal processes is not sufficient to yield the same outcomes. In other words; in difficult environments, caregivers have to exert more effort and more time to achieve the same level of success for their child. In a study observing birth weight, social class, and mother-child interaction, mother-child interaction emerged as the best predictor of the child's social-emotional well-being (Liaw & Brooks-Gunn, 1994). However the amount of effort that the mother had put

forth varied by the level of social-class, that is mothers in disadvantaged environments had to work much harder to achieve the same results.

Bronfenbrenner perceives the environment as "a set of nested structures, each inside the other like a set of Russian dolls" (p.3, Bronfenbrenner, 1994).

The immediate setting of a person is called the *microsystem* and includes home environment, school environment, some neighborhood settings (e.g. playground, library), all of which directly interact with one's intrapersonal variables. The microsystem includes a pattern of activities, interpersonal relations, and social roles that are experienced by the individual. Within the immediate environment, proximal processes are created and maintained through face-to-face interaction with the child, but also through provisions made to the individual or by inhibiting particular responses (Bronfenbrenner, 2009). For example parenting and the home-environment is a complex process that involves bidirectional relationships between members of different generations and that are engaged with several institutions within a context (Lerner, Rothbaum, Boulos, & Castellino, 2002). Researchers generally agree that parenting involves multiple integrated relationships that may inhibit or promote the development of a child. Additionally, children are not passive recipients. The specific characteristics of a child influence and stimulate differential reactions from their parents. This in return creates a feedback cycle for a child. In a way, children help to organize their own feedback cycles, therefore contributing to their own individual development. This bi-directionality seems not apply to parents alone but does exist in any microsystem involving other persons interacting with the child (i.e. example teachers, peers, or boss).

A second structure is called the *mesosystem*, which involves interactions between two micro-systemic variables that have an effect on the child's development (e.g. parent-work communication, parent-school communication). The linkages between two mostly independent

systems can affect the developing person, and involve mostly communication patterns and decision-making processes by parents or personnel contained in the individual microsystems (Green, 1994). Examples of links that have been shown to make an impact on children and their families are the Head Start program implemented in the 1970's, where parent empowerment and parent involvement were seen as detrimental components for the programs' success (Tekin, 2011). Even Start is another local program that successfully sought to mandate parent-involvement in order to increase academic achievement in young children (reading and math skills) (Pierre, 1993). In this program, parents were required to engage in a school-family partnership and attend workshops offered by the school, apart from receiving their own GED. Well implemented and funded programs such as Head Start and Even Start show that collaboration between systems can be quite effective in creating positive trajectories.

The *exosystem* refers to the location of a home, school environment, and resources, and society and policy making overall (Bronfenbrenner, 2009). The exosystem includes the linkages and processes that take place in at least two settings and have lasting developmental impacts upon an individual and their immediate setting. Examples of research in this area include the parents' workplace, family social networks, and neighborhood contexts. Furman and Buhrmester (1985) for instance postulated that each relationship a child forms within his/her network has a specific role, but the role the relationship take-up is also depended on other relationships. In short, social networks of children are interdependent and reinforce as well as complement each other, while parents become important facilitators of such processes. In a more recent study, it was found that the structure of social networks differed by culture, but the affective climate of the relationship formed were still depended on the parents affective dimensions displayed at home (MacPhee, Fritz, & Miller-Heyl, 1996). Thus, parents inadvertently affect the relationships

and social networks children engage in, but as the child has the opportunity to form relationships of their own such as in school, interventions can make important impacts.

The systems of any particular culture are additionally interconnected and organized through patterns referred to as *macrosystem*. These patterns capture the ideologies and how a culture's policies, put forth by political and religious institutions, may affect an individual's growth on multiple levels of his/her life (Bronfenbrenner, 2009). The life-course and life-styles of individuals are observed in these broader systems. However, they span further than just social class or cultural norms and include also historical events, sub-cultures, and important psycho-social thinking patterns of a particular system.

Bronfenbrenner's model conceptualized for the current study. In Bronfenbrenner's model intra-individual variables and the micro-system are linked the closest during early development. The characteristics of a child that will be measured in this study and relate directly to their academic achievement as seen from previous research are self-efficacy, intrinsic value for education, ability to self-regulate, and level of academic engagement. These variables are also influenced by how family members, caregivers, peers, and other persons respond to youth in the home, school, and neighborhood contexts and could possibly be modified if problematic. Variables that can be reliably measured and relate to the microsystem in this study are the parent's attitude towards education, the academic orientation of the peer-group, school climate, and neighborhood structure.

The second immediate layer in Bronfenbrenner's Model is the Mesosystem. Here the connections between two or more systems are observed most often between two different micro systems such as home and school, or home and peer group (Bronfenbrenner, 2009). The influences are multidirectional in that what happens in a microsystem, such as the home in which a child lives, can influence what happens in the school and play a role in what happens at home.

More specifically, a parent's and a teacher's involvement in the child's education, if mutual, will result in mesosystem functioning. For this study, it will be observed how parent-teacher or parent-school communication relates to academic achievement.

School climate and neighborhood context can be considered mesosystem or microsystem variables depending on what variables are included in the measurement tool. For instance, child-teacher relationship and peer-group interactions are microsystem variables. However, if community and schools work together to provide safe after-school-care, or implement school-community interventions to provide for a child's smooth transition from school to community resources, these connections/variables would be considered part of the mesosystem (Krishnan, 2012).

The third and fourth layers are the exosystem and macrosystem. These systems impact a child's development even though they do not necessarily come into contact with it. An example of exosystem variables is a parent's work-schedule or a school's policy on how to handle certain special needs children or responds to families with specific ethnic backgrounds. Macrosystems are comparable to the larger societal blueprint such as politics, culture, economic characteristics that collectively shape a particular social group.

Social cognitive theory. Embedded in ecological systems is the notion that among individuals learning takes place. Besides attachment, it is the basic mechanism that shapes parent-child interaction, child functioning in classrooms, and sets forth expectation on what behavior should be like at a certain age. In its most basic, learning is influenced by the precedents and antecedents of an expected behavior, but also motivational and attentional resources put forth by the individual.

Social Learning can mean all learning that occurs as a result of the social interaction (LeFrancois, 2012). The outcome of social learning is the knowledge of what is socially

accepted. Bandura (1977) posed that much of social learning is observational learning. That is learning through imitation. Imitative behaviors are often reinforced and therefore can become relatively quickly learned. This is relevant to this study, because much of the learning taking place in classrooms, amongst peer-groups, and within the neighborhood context is observational learning.

Bandura, Ross, and Ross (1961) demonstrated in their famous Bobo-doll experiments that we learn through imitation, and there is clearly a modeling effect for the acquisition of novel responses. The model is based on operant conditioning, which occurs when surrounding circumstances associated with the reinforcement of a behavior become associated with the action itself (Bandura, 1986, 1997). Therefore accompanying stimuli originally not set out to become a reinforcer, may become reinforcing and drive behaviors over time. For example, when a teacher attempts to punish inappropriate behavior of a child within the classroom by removing the child from the room, other children may laugh in response to the silly behavior. Unintentionally the other children have now learned two things, apart from that inappropriate behaviors will be punished. First, that silly behavior will be rewarded by attention from other students, and secondly the student who was removed and did not need to engage with the academic work originally set forth by the teacher. Similar mechanisms may be at play in classrooms where verbally and physically aggressive behaviors occur. Therefore, the physical environment in which the class is embedded, *and* by the ways in which groups are structured has an influence on pupil's learning and academic outcomes (Ayes & Gray, 2013). Furthermore, particular school policies, teachers' attitudes and expectations, and supportive and involved school personnel can have an influence as well, and create either a positive ethos of learning and support at school or have negative attitudes of aggression or avoidance (Thapa, Cohen, Guffey, & Higgins-D'Alessandro, 2013).

Intrapersonal Predictors of Achievement

Academic self-efficacy. Generally self-efficacy and academic efficacy has been found one of the strongest predictors of academic achievement throughout the literature (Chang & Chien, 2015; Bandura, Schunk & Zimmerman, 2012; Marsh & Seaton, 2013). Students who believe that they are capable and well equipped to accomplish a task, are expected to be more likely to succeed and will be motivated to put forth appropriate effort and persistence (Mega, Ronconi & DeBeni, 2014).

Bandura (1997) described three different levels at which perceived self-efficacy contributes to academic achievement. Self-efficacy beliefs function at individual levels, but also group-levels (e.g. efficacy beliefs of a class-room and the teacher), and institutional levels (e.g. efficacy beliefs of a school and the school staff), and impact individual students' academic achievement.

Bandura (1992) stated that efficacy beliefs influence how people feel, think, and motivate themselves, which therefore influences subsequent behavior. Thus, how a person thinks about themselves, and the mental processes that concern the anticipated outcome of an action are all linked to self-efficacy (Lefroncois, 2011). For example, in several studies, it has been shown that students that believe that they can perform well at a task also had better achievement than those students that had self-doubts. Results held true even when the two groups of students were at the same skill-level at the beginning of the study. Especially in situations when students perceived increased levels of pressure (such as during an exam), students with high levels of self-efficacy tended to stay task-oriented and rather than focused on the possibility of failure or other negative thoughts.

Self-efficacy also incorporated building a strong positive belief-system regarding one's own ability (Bandura, 1992). These kinds of students believe that ability and doing well at a task

is something that can be acquired and controlled. These kinds of students also understand that making mistakes is a part of learning. They are able to learn from errors, keep working on tasks despite difficulties, and seek out knowledge as well as help on their own.

Self-efficacy is also related to how much control students feel they may have over their own learning and their own knowledge (Zimmerman,1990). Students that have good self-efficacy beliefs tend to spot and use opportunities within their environment more consistently and also tend to be more persistent and creative to make these opportunities work for them. These concepts are especially important when students have to operate within the classroom or achieve team goals because that means being evaluated not only by the teacher but also being compared to the performance of other students (Lefroncois, 2011). Students with high levels of self-efficacy tend to make more positive evaluations about themselves when compared to others and can integrate critical feedback consistently into productive learning goals.

Levels of self-efficacy in students have long-term implications. In a longitudinal study, researchers sought to understand the role between self-efficacy and intentions to drop out of high school (Alivernini & Lucidi, 2011). The researchers followed the students for about two school years and found that self-efficacy measured at the beginning of the period predicted how motivated the students were at the end of the term. Motivational variables also played significant roles in the student's intention to drop out of school.

In another longitudinal study self-efficacy beliefs were found to partially mediate the relationship between the personality traits conscientiousness and openness in junior high school, but not so in senior high school (Caprara, Veccione, Alessandri, and Gerbino, 2010). For the older adolescents in that particular study, self-efficacy was directly related to academic achievement. Likely the confidence in one's own ability to take charge of studies, managing the

various academic tasks successfully, and to work independently become precedents in achieving future goals.

Academic engagement. Recent studies have conceptualized academic engagement through three major constructs: behavioral engagement, emotional engagement, and cognitive engagement (Wang & Holcomb, 2010). For this study behavioral and cognitive engagement and disengagement will be of importance only, because these constructs have been identified most consistently as a precursor for academic achievement across the literature (Wang & Eccles, 2013). Behavioral engagement for this study is conceptualized as overall positive classroom behaviors, such as putting forth the appropriate effort, participating in class, being attentive, and completing school work.

The connection between academic engagement and academic achievement is simple. Children that show poor learning behaviors, are less on-task, and have difficulty cooperating with the teacher and other students, are less able to complete their school work, because they automatically reduce the time listening to teachers, therefore, missing part of the lecture (Urdan & Schoenfelder, 2006). They also spend less time practicing skills, therefore, miss opportunities to rehearse important skills, and consequently become less fluent at a skill. Most curriculums are as such, that they built on skills previously learned. Children that consistently spent less time at on-task will have trouble catching up with missed academic work at the end of the school term, or from previous years (Duke, 2015). The effects of poor academic behavioral engagement are clearly cumulative.

Some studies found that self-efficacy may have a moderating effect on student engagement and academic achievement (Chang & Chien, 2015; Pajares, 1996). With increased self-efficacy beliefs students tend to be behaviorally more engaged in academic tasks. This relationship can be explained in that when students develop a sense of personal competence and

autonomy (which is directly related to self-efficacy) the more efficacious and motivated students become (Schunk, 1991). Especially with increasing age of students', self-initiation and self-regulation of behavior become important precursors to completing school work and become proficient in the skills set forth by the teacher (Wang & Holcombe, 2010).

A recent study has found that academic engagement was directly and positively related to GPA in high school students (Froiland & Worrell, 2016). The study also found that academic engagement was mediated by intrinsic motivation. Results held true for gender and minority status students (African American and Latino Americans). Another study found that students that drop out lack academic engagement, and show a range of behaviors that put them at risk for school drop-out such as: not coming to class and school on time, being largely unprepared for in class work, less effort expended to complete assignments, in addition to being disruptive in class (Finn & Rock, 1997).

Intrinsic value of education. This construct includes students' goals and beliefs about the importance and interest of an academic task. Relations between the intrinsic values of education and academic achievement can be explained. Higgins (2011) stated that valuing something may also mean wishing to attain it. Therefore valuing something can become a motivational factor. Behaviors are the combined result of beliefs, motives, expectancies, and incentives (Atkinson, 1957).

Differences in the values youth assign to education can have important consequences to the academic behaviors in terms of time, frequency, and energy they are willing to expend to the particular academic task (Urdan & Schoenefelder, 2006). Youths that believe that math and English are important subjects and doing well in these subjects will help them in the future will most likely fulfill academic work assignments provided by the teachers. Students who see doing well in school as part of their self-image may show behaviors that are consistent with their belief

system (Wigfield & Cambria, 2010). While self-efficacy theory perhaps explains best feelings of competence in students and its relation to the expended effort to school work, Self-determination theory explains why students' ideals and values can become a driving force to academic behavior (Eccles, 2005).

Motivation, intrinsic motivation, and motivation that is related to high personal interest in the task or activity (value) is not a stable trait of an individual, but a highly changeable, contextual, and domain-specific construct (Linnenbrink & Pintrich, 2002). Students can be motivated in multiple ways, and their motivation can vary depending on the situation or context in the classroom or school.

This brings implications for teachers and curriculum designs because it suggests that instructional efforts and the design of classrooms and school materials can make a difference in motivating students to put forth their best efforts. So, for instance, teachers can try to enhance situational interest and promote both *catch and hold factors* (Mitchell, 1993). These catch and hold factors include teaching techniques that spark interests and keep students engaged, as well as explaining to students how academic materials relate to real life scenarios and how they are connected to important decision-making processes for them later in life. Curriculum design for challenging subjects can become important interventions. One major prerogative becomes increasing personal relevance and value to the students across middle and high schools (Eccles et. al., 1993).

In one study which observed how students valued an academic context and measured motivational variables and self-efficacy, positive values and increased levels of motivations predicted academic engagement (Walker, Greene, & Mansell, 2006). Additionally, these variables showed distinctively different pathways as compared to sources of extrinsic motivation.

Self-regulation in goal-directed behavior. Greater levels of self-control and goal-directed action become an important skill to avoid risks and achieve future academic goals (Rhodes & Rhodes, 2009; Thompson, 2012). Lerner et. al. (2005) and Bowers et. al. (2014), argued that *adaptive* behaviors are those that involve an integration of context specific processes that are intentional. This is called *Goal-Oriented Self-Regulation.* These intentional self-regulation processes also involve a conscious allocation of mental or actual resources towards achieving a goal (Baltes at. al., 2006). While self-regulation in goal-directed behavior is also dependent on more biological origins of self-regulation (e.g. focusing, attention span, delay of gratification, inhibition) (Eisenberg, 2000), it has been defined as a separate construct in relations to achievement and career development for children aged eight years to sixteen years and includes the broader structure of decision making processes (Gestsdottir et al, 2010; Mueller et al, 2011).

These processes have been measured successfully and consistently in children and have been shown to relate to better decision-making processes in youth (Napolitano et al., 2011). Specifically Goal-Oriented Regulation Behaviors employ processes of 'Selection' (the process of identifying a goal), 'Optimization' (the process of employing resources towards the goal), 'Compensation' (the process of modification or adjustment of behavior when something get in the way of the goal), and 'Loss-Based-Selection' (the process of choosing a new goal after a loss has occurred) (Freund & Baltes, 2002; Gestsdottir & Lerner, 2007).

Examples of Goal-Oriented Self-Regulation as related to adolescent development include making choices as to whom a youth spends time with, what he/she may spend his/her money on, or what academic goals he/she attempts to pursue. Such choices tend to increase and become more purposeful with age (Hui & Tsang, 2011). Environmental demands tend to increase with age and the more mature youths are presented with more opportunities and increasingly complex

choices (Larson, 2000). Mueller et al. (2011) suggested that a variation across contexts may exist as well as across developmental demands, where parenting or other positive relationships may have a moderating effect when youth are faced with adversity or overwhelming environmental demands (Bowers et al, 2014; Napolitano et al. 2011).

Nonetheless, children are becoming increasingly more self-aware as they grow older. With the onset of puberty self-evaluation, concepts of self, and how the youth perceives him/ herself within his/her social environment becomes an important developmental step (Brandtaeder, 1998). At some point during adolescence, youths develop a sense of *personal future*, which is related to processes of self-regulation (Gestsdottier & Lerner, 2007). It means that with increasing maturity youth become more purposeful in selecting their goals and enact behaviors that help them to attain their goals in combination with self-regulatory behaviors such as directing attention and delaying rewards.

Previous studies have found that goal-oriented self-regulation behaviors occurred in relation to reaching more age-appropriate developmental steps while low scores on the self-regulation scale were associated with increases in problem behaviors (Gestsdottir & Lerner, 2007; Lerner, 2009). Thus, logically sound decision-making skills are associated with positive behaviors. Interestingly the concept also included a variable that measures how well an individual recovers from a set-back and integrates that experience with follow-up choices.

Bouffard, Boisvert, Vezeau, & Larouche (1995), posited that goal orientation matters in students and is related to higher overall GPA. Other studies have demonstrated that constructive use of selective strategies, optimization strategies, and compensation strategies regarding goal-directed actions can improve positive outcomes in youth above the age of twelve (Gestsdottier & Lerner, 2007). Youths that have good self-regulation skills and thus have higher levels of goal-

directed behavior tend to show decreased problem behavior, spent more time on-task in educational settings, receive better grades, and are completing more homework assignments.

Microsystem Predictors of Achievement

Parental educational attitudes and behaviors. The literature on the effects of parental practices, parental involvement, and parental attitudes in relation to educational outcomes of their children has accumulated overwhelming evidence of the important roles parents play regarding their child's academic achievement (Dearing, Sibley, & Nguyen; 2015; Watkins & Howard; 2015). Parents' behavior and their beliefs systems seem to be clear predictors of a child's academic achievement, and may even offset adverse factors such as low SES and residing in an impoverished neighborhood.

In a meta-analysis by Fan and Chen (1999) which evaluated the relationship between academic achievement and the differing dimensions of parental involvement researchers found that parents supervision at home had the weak relation to academic achievement, while the parent's aspirations and expectations for their children's academic achievement was the strongest predictor (r = .4).

The literature varies widely in terms of what is considered parental involvement/attitude towards their children. For instance, some studies include checking children's homework, communication with teachers, and involvement in school activities, as well as parental attitudes towards school. Therefore, it becomes important to specify what exactly is considered as parental attitudes toward education. For this study, the researcher will only consider parental aspirations for their children and the communication of clear expectations for their child's school work. In fact, the extent to which parents presume their child will perform well in school was found the strongest predictor of academic achievement (Porumbu & Nescio, 2012).

Researchers assume that parental attitudes become important when children receive feedback for their school performance from their parents (Antunes & Fontaine, 2004). That is, when parents are either pleased or disappointed about their child's performance, they communicate such feelings. Additionally, the direct influence of parental attitudes on academic achievement can be observed when parents involve their children in discussions about schooling and academic matters. These parental talks tend to lead to higher beliefs in their own academic capabilities, and thus to a higher academic self-concept in the child. It could also be that parent that set high expectations for their child communicate such expectations frequently, and therefore also model and portray important values about academics to their child (Jeynes, 2007).

In a meta-analytic by Dauber and Epstein (1989), several variables believed to be important in students' academic achievement were compared. The parents' belief systems about the importance of school and the school itself were the single most important predictor of school achievement of children. More important than SES, the actual school environment, the parents help with homework or the parents' attendance at school events. Another study by Jacobs and Harvey (2006) utilizing a regression analysis, found the strongest predictor of high school achievement was the parents' expectation of their child's future educational level. In a more recent meta-analysis by Jeynes (2007), it was also found that high parental expectations about academic achievement in their child were consistently related to academic achievement in youth 1^{st}-12^{th} grade.

Peers' academic orientation. Recent studies have found that peer relations have significant effects on academic engagement (Conley, Mehta, Stinebrickner, and Stinebrickner, 2015). Several studies found that students tend to emulate each other, and if peer-groups are structured in ways consistent with a classroom culture that encourages academics, most students tend to benefit from such interaction (Kindermann & Vollet, 2014). Social Learning Theory

emphasizes the connection between individual cognitions, behaviors, and environmental contexts (Bandura, 2004, 2009). This theory postulated that acquiring knowledge depends on experiences of interacting with and observing others. The observation of desired behavior from role models is a major factor in learning. Role models in social cognitive theory can be individuals who provide concrete explanations/demonstrations of how to behave in particular situations and are perceived to be credible (e.g. valued peers, teachers, older siblings).

There are extensions of Social Learning Theory. For instance, Martin and Dowson (2009) propose that all human beings experience a *need to belong* and most individuals experience a desire to *fit-in* with a particular group. For instance within a classroom environment, peer group, and school environments, individuals' gain from interpersonal relationships in that they internalize at least some of the values held by the persons in their immediate environment as part of the relationship. To *internalize* means that values and beliefs of the other person or group become part of one's own belief system. Feeling related to the group can support and increase positive mood and will reinforce the learned cognitions and behaviors (Barsade, 2002). Unfortunately, the same can be true for negative behaviors. However peer environments that support cooperative learning through positive peer interactions show consistently positive outcomes for students' emotional well-being as well as their academic achievement (Johnson, 1991).

In a study by Hanushek, Kain, Markman and Rivkin (2001) it was found that peer achievement has a positive effect on students' achievement growth. Another study found that a students' friends' motivation can influence academic achievement although the students' sense of belongingness to the school and their own motivation explained a significantly higher portion of the variance between academic achievement and the related variables (Goodenow & Grady, 1993).

School climate. Evidence has been found that students that perceive a positive school climate have a better academic performance such as better standardized test scores despite multiple challenges at home (Henderson & Mapp, 2002; Cohen, Thapa, Guffey and Higgins-D'Alessandro , 2013). Positive school culture includes concepts such as overall positive attitudes towards learning for all students, having a sense of belonging, and feeling connected to the school, positive relationships with teacher and administrative staff, safety policies, and more (Youngblade et. al., 2006).

Schools are likely institutions that provide both, opportunity and risk to students. Opportunities are presented in terms of access to educational and intervention programs regardless of the students' health status, family background, or SES (Samdal, Nutbean, Wold, & Kannas, 1998). Schools can also become important entrance points for families when problems have arisen or persisted because schools can provide resources and support when the school personnel responds appropriately (Furrer, Skinner, & Pitzer, 2014). At the same time, considerable negative factors can become amplified when at-risk students do not receive the help they need. For instance, Samdal, Nutbean, Wold, and Kannas (1998) suggest that students with negative perceptions of school will most likely dislike school and are most likely those that fail academically and are at the highest risk to adopt negative behaviors such as drinking, smoking, and poor attendance of classes. School-wide interventions on improving school-climate and the resulting improved academic achievement have shown to be successful. For instance, a school-wide program implemented in middle school over a three-year period has shown significant reductions in disciplinary referrals and suspensions, plus a significant increase in math and reading scores (Lassen, Steele, and Tailor; 2006). Four important variables have been identified within the literature regarding school climate and will be discussed individually are (1)

Relationships with adults at school, (2) *School connectedness*., (3) *Opportunities for meaningful participation at school,* and (4) *Perceived school safety*.

Relationships with adults at school. Good relationships with adults at school are associated with a positive perception of school (Epstein & Karweit, 2014). Schools that are run efficiently and fairly and a classroom structure that lays out clearly defined rules and expectations gives students a chance to respond and behave in manners consistent with what is expected (Hughes & Kwok, 2007). Not surprisingly research in the area has been adapted from research in job-satisfaction (Karasek and Theorell, 1990). And this research shows that even though students have a lower autonomy status in schools, that when student receive good social support and they feel their management and colleagues care about them, they are more satisfied with their work environment, hence school.

Teachers play the largest role in communicating expectations and evaluating the academic performance of a student. Therefore, teachers that have good classroom management skills that minimize opportunities for students to misbehave are a vital part of school climate (Amstutz, 2015; Borich, 2016; Singer, 2015). Teachers, most often the homeroom teacher of a child, are also the adult that the children spend the largest proportion of time with, and are often the ones who notice first when problems arise. Therefore, teachers that are supportive, attuned, set forth reasonable expectations, and are committed to their jobs, are the ones providing best for all children (at-risk or not) in their classroom (Powell & Powell, 2015) and can become role models to a youth.

Not only teachers, however, are important. Researchers found that the organizational structure of a school should be ‘open’ versus ‘closed’ (Cohen, Manion, & Morrison, 2013). That means that staff, principals, and teachers are task-oriented, treat students with consideration, and cooperate well with each other. Principals, in particular, should have and emphasis on

productiveness in terms of academic achievement of the students and providing resources to the students, as well as interact with all departments within a school frequently and positively (Uline, 2014). Principal practices have been shown to have direct and indirect effects on academic achievement. Principals that are considerate, helpful, concerned about their teachers welfare, and are willing to make changes are generally considered to be most effective leaders. They also should communicate a clear set of expectations without appearing snub, and therefore set a general tone for the school's climate.

School connectedness. A combination of student engagement and school staff that is enthusiastic about the students' work is likely to contribute to school connectedness, as well as ongoing commitment to education (Center for Disease Control, 2009). It is an especially important variable for youths that are already at-risk because feelings of alienation and isolation are likely to add to feelings of inhibition and connection to others. Improving school connectedness for students requires team effort (Larson, 2014). Schools, school staff, and community must come together and decide which resources that can provide for students, and which solutions are most feasible for them to implement. Improving school connectedness can be done relatively easily once administrative barriers are removed (Bowen, 2012). For instance by involving families in their students' academic and school life, provide students with academic and social skills, using teaching methods that foster positive environments, provide professional development, and continue open communication between staff, administration, students, families, and communities (Osher, 2009).

In a study by Bond et al. (2007), significant relations were found between the level of school connectedness and risk taking behavior such as substance use and depressive symptoms, and school completion. The study emphasized the complex interactions between variables. For instance, in this study while school connectedness alone did not have a significant impact on

academic achievement and school retention when students fell in groups where they showed depressed symptoms and were low in school connectedness they experienced an increase in their symptoms and poor academic achievement. Other researcher suggested that the relationship between school connectedness and academic achievement may be of causal nature (McNeely, Nonnemaker, & Blum, 2002). They posited that increasing connectedness will decrease risk behavior. Thus, schools that meet their students developmental needs are more likely to lead to successful academic careers.

Opportunities for meaningful participation at school. Schools and classroom contexts need to grow with the learners themselves. Unarguably, motivational factors play a significant part in students' success in their educational pursuits. Students who want to learn and develop a sense of personal investment in their learning will strive to do well and enable themselves to gather the resources they need to succeed (Jennings, 2003). Other researchers have argued that the main developmental needs of high school students revolve around opportunities for growth that steadily increase responsibility and autonomy while at the same time receiving support from caring adults. For instance, McNeely, Nonnemaker, and Blum (2002) found that when teachers encourage self-management and allow students to make decisions, overall classroom climate improved.

The construct of *meaningful participation* is relatively new, yet a robust indicator of academic achievement and high school retention (Jennings, 2003). It is defined "as the involvement of students in relevant, engaging, and interesting activities with the opportunities for responsibility and contribution" (Benard, 2002, p.9). Meaningful Participation is not a one-way street. It implies that learning environments put forth opportunities for growth and set forth high expectations for every student. In return, students enrolled perceived the school and all its connected facilities as an institution they feel invested in (Jennings, 2003). However, it is the

schools' responsibility of presenting the child with opportunities. For this purpose schools can have a wide variety of low-budget solutions that can focus on developing leadership skills in young adults and enhance a sense of self-confidence such as sports clubs, band, theater clubs, school newspaper, classroom management such as presentations, encouraging volunteering, and community outreach (Schwartz, Axtman, & Freeman, 1998). As Bernard (1995) so pointedly put it: "when children are given responsibilities, the message is clearly communicated that they are worthy and capable of being contributing members (p.13)".

Perceived school safety. Self-reported school and neighborhood safety are associated with academic achievement starting in elementary grades. Researchers suspect that when students are concerned about their safety and are fearful and worried their ability to concentrate their energy on their studies is compromised (Milam, Furr-Holden, & Leaf, 2010). In addition, schools provide the context for student socialization yet student's emotional, behavioral, socio-emotional, physical, and academic well-being is compromised in schools that have a high occurrence of victimization, delinquency, and drug/substance use (Hyman et. al., 2003). Bowen and Bowen (1999), proposed that aggressive behaviors directly impede teaching and learning processes and therefore academic achievement. One mechanism is that the negative behavior diverts the teacher and the time students stay engaged in learning. Additionally, the threat of crime can cause children to stay home and miss valuable academic time, as well as a feeling less competent to meet the multiple academic demands. Thus, in terms of school climate, it is very important to understand the levels of safety students experience at school.

Neighborhood structure. Children educated in large urban school districts tend to have lower academic performance than compared to children living in any other neighborhood context (Posner & Vandell, 1999). Researchers argue that children raised in these contexts face numerous disadvantages ranging from less-educated parents, generally distressed communities,

and negative peer influences (Sanbonmatsu, Kling, Duncan, Brooks-Gunn, 2006). There are also researchers that argue that influence of neighborhood on educational outcomes is small while many unobserved characteristics exist and research is often biased (Duncan & Raudenbush, 1999; Harding, 2003). However considering the large amount of studies revolving around risk and resiliency it becomes clear that it is not just a single risk or protective factors but the accumulation of such factors that may cause negative disruption in developmental trajectories (Rutter, 1989; Klebanov, Brooks-Gunn, McCarton, & McCormick, 1998; Liaw & Brooks-Gunn, 1994). Also, neighborhoods tend to have combined deficiencies in positive role models, child monitoring, career choices, employment opportunities, and provide inadequate informal and institutional resources (e.g. library programs, community center sports activities) (Ainsworth, 2002).

Research in this study, however, will focus on a conceptual framework proposed by Jencks and Mayer (1990) and is consistent with Bronfenbrenner's Ecological Systems Theory in that individual behaviors are linked with neighborhood effects. Specifically, *neighborhood institutional resource models* posit that neighborhood resources may affect youths through access to resources that provide stimulating learning and social environments, such as parks, libraries, and community centers, as well as community services that promote healthy development. While overall neighborhood effects are undeniably present, the need to find specific and changeable agents remains in the forefront in this study.

Mesosystem Predictors of Achievement

Parent-teacher-school communication. The general presence of a parent at the school, in regards to responding to problems and implementing solutions regarding the child, seems to have beneficial effects on academic outcomes such as regular school attendance and grades (Grolnick & Slowiaczek, 1994; Moreso, Hill, & Taylor, 2004). The concept has been described

more broadly throughout research as parental involvement. However, parental involvement has been measured throughout the literature with several surveys involving many different components. Such components include but are not limited to: parental aspirations for their child's academic achievement and the conveyance of such aspirations, parents communication about school, parents' participation in school activities, parents' communication with teachers and school personnel, help and monitoring of homework assignments, rules and expectations implemented at home regarding the child's school behavior and school assignments and more (Harris and Goodall, 2008).

The concept of parental involvement is convoluted, and the overlap of the beforehand mentioned components are largely unhelpful in regards to strategizing targeted interventions. Singh et al. (1995) for instance noted that some dimensions have important implications while others do not matter at all regarding positive academic outcomes for students.

For this study, the focus will be on communication (orally and verbally) between parents and teacher, and parents and other school staff, as well as collaboration and interest in school events. Eccles and Harold (1993) argue that when parents are involved in meaningful ways with the school that their child attends, all students benefit. They, however, point out that parent involvement, including parent communication, is dependent on the parents themselves as well as the schools that support open channels for input. For instance, schools that put a value on informing parents and sharing information about their programs and activities, and schools that value collaboration and active decision making of parents are more likely to have parents that are involved in all kinds of ways with the school. These parents tend to continue to support their child's learning across middle and high school years. Examples of communication include regular parent-teacher conferences; information sessions about course content and course choices, teacher-parent team discussions, and assigning advisory teacher that the parent can

contact and stay up to date regarding their child's academic progress (Preciado, 2014). Parent-school collaboration in regards to connecting community resources for their children seems also to play a role for students to be successful, especially in neighborhoods where safety deficiencies exist (Eccles & Harold, 1996).

Researchers found that the most important mechanisms that played a role in the parent's contribution and the child's success in school were that parents raised their children's sense of self-efficacy through the operation of verbal persuasions, modeling, and continuous reinforcement (Bandura, 1993). A parent that seeks and provides feedback from teachers shows interests and compliments the child's school performance and showing their own interest and beliefs in the importance of school tasks (Hoover-Dempsey & Sander, 1995). As a result, the children developed attitudes, behaviors, and displayed efforts consistent with school success. Thus, children whose parents displayed and communicated behaviors that supported school success were more likely to succeed than those children whose parents infrequently or never communicated with academic staff members.

In a study that measured the teachers perceptions of several kinds of parental involvement variables, it was found that parental involvement, including frequent communication with the teacher about the child, predicted academic success the following school term (Hughes & Kwok, 2007). The researchers also pointed out that the way parents and teachers interact also is an index of the shared values and expectations of the home. Other studies with samples differing in ethnicity and SES have also demonstrated that this particular dimension of the home–school mesosystem is associated with student's achievement (Hill et. al., 2004; Hill & Taylor, 2004; Kohl, Lengua, & McMahon, 2000).

Socioeconomic status (SES)

Clear differences by SES exist between academic achievement, parent involvement, neighborhood structure, parental educational attitudes, and school climate exist, which in return also affect student's self-efficacy, goal-orientation, and academic engagement. For instance, positive relations with teachers in the classroom and between home and school appear to be less common for low-income and racial minority children than for higher income white students resulting in less frequent communication with teachers (Kohl, Lengua, & McMahon, 2000). These negative associations with the school have been found to contribute to disparities in achievement.

Studies have identified three specific risk factors associated with SES that can affect academic achievement in a child: (1) parental education, (2) maternal depression, and (3) single-parent status (Hill et. al., 2004). In regards to parental education, parents who have low educational status are more likely to hold low-income jobs or are unemployed, and deal with multiple life-stressors that reduce their ability to provide positive experiences for their children. Variables associated with this range from poor nutrition, low quality or little health care, fewer growth opportunities for children, fewer opportunities for positive association with peer and role models, chaos in the home, less structure, and inadequate discipline (Rumberger, 1995; Bradley & Corwyn, 2002; Siri, 2005). Consequently, children come to school less prepared, less rested, experience little consistency in the home, and have a higher likelihood to have experienced a significant loss or some sort of trauma. The combined impact of negative life stressors and a higher likelihood of receiving fewer interventions leave a child living below the poverty line or within a family just above the cutoff, vulnerable and less prepared for academic life.

In regards to parental depression, it is important to note that depression can be set off by family stressors and have a negative impact on many domains of a family's life in return, which

may maintain depressive symptomology (Bradley & Corwyn, 2002). Additionally, the interpersonal difficulties that are often associated with depression may further hinder a positive relationship with the teachers and has caused parents to generally feel more negatively about things. This then decreased both the likelihood of initiating involvement with schools, minimized help seeking for their child and blocked important resources as well as decreased an overall positive perception of others including their own child (Hechtner, 2000). Depression in parents is often combined with multiple other stressors such as single-parent status and becomes an inhibitor for help seeking.

Single-parent status was found to be related to lower quality of the parent-teacher relationship but not necessarily to lowered parent-teacher contact (Hughers & Kwok, 2007). Often single-status means lowered combined family income. Low-income parents, in general, are at particular risk of low-quality jobs, that is jobs with few benefits, higher physical hazards, higher tedium, and little opportunity for advancement (Perry-Jenkins, Repetti, & Crouter, 2000), which can in return negatively affect children's mental and emotional health as well as their academic performance (Jesus, Yoshikawa, & McLoyd, 2006). Single-parent status is also related to the frequency and consistency a parental monitoring, resource provision, and may, therefore, put the child at risk for academic failure. Sui-Chu and Willms (1996) for instance found when conducting a study using a detailed breakdown of parental involvement variables, that SES was closely related to the amount of monitoring caregivers could provide which mattered significantly in regards to the academic success a child had.

In summary, a recent meta-analysis by Sirin (2005) found SES one of the strongest predictors of academic achievement, with parental income and parental education also significantly related to the academic achievement. Previously presented studies show that there is an aggregate relationship between various variables (e.g. school location, receiving free lunch,

neighborhood structure, and academic achievement) and that it is important to control for an overlap in these differences when observing variables. Thus, the researchers of this study will control for differences in SES.

Importance of this Research

Bronfenbrenner's theoretical model highlights the importance of studying factors on multiple levels simultaneously. The literature on SES is longstanding and shows clear directions. The overwhelming majority of studies has shown that low SES is connected to poor academic outcomes, most likely because low SES increases the frequency of the stressful life events and cumulative strains on the family (Dearing, Sibley, & Nguyen, 2015; Williams & Mohammed, 2009; Brown et al., 2000). A reasonable assumption is if one was to target prevention and intervention efforts at multiple points in a person's life that would maximize the effectiveness of such efforts. This paper aims to identify multiple systemic variables to better understand that are related directly or indirectly to academic achievement in youths, as academic achievement is related directly to wellbeing, future success in life, decreased risk behaviors and stress, and increased health status when youths receive their high school degree and aim for a college career.

CHAPTER 3 - METHOD

Participants

Participants were drawn from a single charter high school in a large Midwestern city. Students attending this school lived in diverse neighborhoods ranging from suburban to inner city areas. The school serves students from Kindergarten through 12th grade. Of the approximately 420 high school students, 330 were solicited for participation in this study. None of the parents refused participation, but 12 students declined during the adolescent assent process. Of the 312 students participating, 12 (3.8%) students had a significant amount (more than 50%) of data missing from their surveys and 4 (1.3%) students responded in an obvious random and careless fashion. Due to this a total of 16 (5.1%) students were excluded from the analyses. Of the 312 final participants, 133 (42.6%) were male, 158 (50.6%) were female, 15 (4.8%) students choose not to indicate their gender, and one (0.3%) person identified as androgynous. A detailed breakdown by ethnicity is provided in Table 1.

Table 1

Breakdown by Ethnicity

	Gender	
Ethnicity	N	%
African American	208	68.4
Hispanic/ Latino	67	22.0
Caucasian	5	1.6
Native American	4	1.3
Romanian	2	0.7
Creole	1	0.3
Middle Eastern	3	1.0
Other	14	4.6

Missing: 15, Androgynous: 1

The largest group of students (*n* = 208, 68.4%) reported their ethnicity as African American, followed by Latino students (*n* = 67, 22.0%). A marginal portion identified as Caucasian (*n* = 5, 1.6%), Native American (*n* = 5, 1.6%), or Middle Eastern (*n* = 3, 1.0%). Students that indicated "Other"(*n* = 14, 4.6%) were most often of mixed backgrounds.

The mean age for the student sample was 16.1 years of age (SD = 1.2) and ranged from 12 years to 19 years old. However, the majority of students were either 14 years (*n* = 28, 9.0%), 15 years (*n* = 81, 26.0%), 16 years (*n* = 83, 26.6%), 17 years (*n* = 73, 23.4%) or 18 years (*n* = 42, 13.5%) old. Students were enrolled in Grade 9 to Grade 12. Students were also of various socioeconomic backgrounds and reported differing living arrangements. See Table 2 for a detailed breakdown.

Table 2

Living Arrangements, SES, Number of Parents Working, Number of Siblings in the Home

	N	%
Living Arrangements		
Living with both parents	116	37.2
Living with father	17	5.4
Living with mother	151	48.4
Living with grandparent	7	2.2
Living with aunt/ uncle	3	1.0
Living with foster/ adoptive parent	7	1.3
Living with mom, grandparents, & stepparent	4	1.3
Family Socioeconomic Status		
Lower	19	6.1
Lower Middle	100	32.1
Middle	98	31.4
Upper Middle	78	25.0
Upper	6	2.0
Number of Parents Working		
No parent works	17	5.8
One parent works	155	52.5
Two parents work	123	41.7
Number of Siblings in the Home		
None	15	4.8
One sibling	37	11.9
Two siblings	63	20.2
Three siblings	65	20.8
Four or more siblings	132	42.3

Most students (n = 116, 37.2%) reported living either with both parents or in a single parent household, with either their mother (n = 151, 48.4%) or father (n = 17, 5.4%) being the primary caregiver. There were 21 students (5.8%) who reported living either with his or her grandparents, aunt or uncle, foster parents, or in a combined household.

Family socioeconomic status was obtained using a procedure developed by Hollingshead (1975). The educational level and type of education of the parents were weighted to obtain a value for the socioeconomic status of each caregiver. The parent with the higher socioeconomic status was used if both parents were employed. Socioeconomic status was categorized into five

levels ranging from lower to upper status. The socioeconomic status was fairly evenly distributed among lower middle (*n* = 100, 32.1%), middle (*n* = 98, 31.4%), and upper middle (*n* = 78, 25.0%), with only a few households falling into the low (*n* = 19, 6.1%) and upper (*n* = 6, 2.0%) range. Most parents were employed, with 155 (52.5%) households having at least one parent working, and 123 (41.7%) students reporting that both parents worked.

Most students reported having at least two siblings. The average number of siblings was 3 children in the home, with only a few families having a single child (*n* = 15, 4.8%), and some having up to 14 children in the home.

Measures

Demographic measures. Adolescents were asked about their age, grade, gender, with whom they lived, the number of siblings, and race (response options: White, Asian, African-American, Hispanic, Native Hawaii/ Pacific Islander, and Other/ describe).

Socioeconomic status (SES). The Hollingshead Two-Factor Index of Social Status was administered to each child (Hollingshead, 1975). This was an eight-item questionnaire. There were four items about each parent that included the following: 1) "Do you live with our mother/father or other female/male guardian?", 2) "Does your mother/father/guardian work?", 3) If he/she works, how much does he/she work?" (full-time or part-time), and 4) "Check the highest amount of education your mother/father/guardian completed". The Hollingshead is considered a more reliable index of SES when children are asked about their parents because children often do not know the exact income of a parent. The education of each adult caregiver living in the home is rated on a 7-point scale that lists the highest grade completed ranging from 7 (*graduate/professional training*) to 1 (*less than 7th grade)*. A response option of 0 (*not applicable or unknown*) was also provided.

Intrapersonal level measures. Measures of intrapersonal factors included academic self-efficacy, academic engagement, intrinsic value for learning, goal-oriented self-regulation. These factors are described next.

Academic self-efficacy. Self-efficacy refers to a student's judgment of his or her capability to successfully organize, attempt, and complete a task (Bandura, 1986, 1997). The 5 item self-efficacy subscale taken from the Patterns of Adaptive Learning Survey (PALS; Midgley, Maeher, & Urdan, 1993) measures the extent to which students believe that they are able to master the skills taught in their classes. Sample items include, "Even if the work is hard, I can learn it" and "I am certain I can master the skills taught in my classes this year". Response options were on a 5-point Likert-type scale ranging from 1 (*Not at all true*) to 5 (*totally true*), with higher scores indicating higher levels of self-efficacy.

Reliability for the measure ranges from good (α = .78) (Midgley, Maeher, & Urdan, 1993) to very good (α =.84) in follow-up research (Liem & Nie, 2008). The PALS has shown to be a reliable and valid measure for students in elementary, middle, and high school, as well as with diverse populations, or populations that are composed primarily of minority students (Midgley et al., 2000). Overall the scales have demonstrated good concurrent, construct, and discriminate validity. It can be concluded the scales also have good internal consistency, because they have been found to be reasonably stable over time (Midgley, et al., 1998). The Cronbach's alpha for the current sample was .90.

Academic engagement. The construct of academic engagement captures the quality of students' participation in school activities (Appleton, Christenson, & Furlong, 2008). That includes whether or not youths stay present and interested in the learning opportunities presented to them. Apart from being physically present in school and completing assignments, engagement also considers a student's effort and persistence at a task that can range from energetic and fully

interested to avoidant (e.g., boredom, apathy, and disruptive non-compliance; Finn, Pannozzo, & Voekl, 1995). The students were given two subscales (Behavioral Engagement and Behavioral Disaffection) of the Engagement vs. Disaffection with Learning Survey (Student Report) by Wellborn (1991). They were asked to report on their own behavioral engagement (5 items; sample item: "I pay attention in my classes") and disengagement/disaffection (5 items, reverse coded, sample item: "In my classes, I do just enough to get by"). Students were asked to choose from 4 response options ranging from 4 (*not at all true*) to 1 (*very true*). Scores could range from 40 to 8. A score of 40, indicated very high levels of engagement, while 8 was the lowest possible score, indicating zero academic engagement (Skinner, Kindermann, & Furrer, in press).

Reliability of the overall measure is acceptable depending on the subscales measured, and has ranged from a Cronbach's alpha of .61 to .85 for internal consistency (Fredricks & McColskey, 2012). Internal consistency has been shown to be excellent ($\alpha = .94$) for the Behavioral Engagement subscale (Reeve & Tseng, 2011), which is why only the behavioral engagement and behavioral disaffection scales were administered to the students.

In terms of validity, cross reporter comparisons between student and teacher reports show that students generally perceive themselves more behaviorally engaged than teachers report them to be. No differences between teacher and student ratings were found on the behavioral disaffection scale (Chi, Skinner, & Kindermann, 2010). During in-vivo observations student and teacher reports were moderately correlated, but significantly higher for disaffection scores. Scores also showed higher agreement and stability for the behavior dimension of the questionnaires for both teacher and student reports (Chi, Skinner, & Kindermann, 2010). Because of these findings, the emotional dimensions were not measured for this study. The Cronbach's alpha for the current sample was .79 for the overall scale. The Cronbach's alpha for

the sub-scale Behavioral Engagement was α = .80 and for Behavioral Disengagement was α = .61.

Intrinsic value for education. The Intrinsic Value subscale of the Motivated Strategies for Learning Questionnaire (MSLQ) was used to assess the students' beliefs about the importance of learning, as well as their interest in academics (Pintrich, 1991). The MSLQ is a 56 item measure on which students are instructed to respond to items on a 7-point Likert scale ranging from 1(*not at all true of me to*) to 7 (*very true of me*) in terms of their learning beliefs. Only the Intrinsic Value subscale was given to the students. It consisted of 9 items that concern a student's interest in learning ("I like what I am learning in most of my classes") and perceived importance of coursework ("I think most of what I am learning in school is useful for me to know").

The measure has been under continuous construction. In its most recent edition the Intrinsic Value subscale (α = .87) was constructed out of items from the Intrinsic Goals subscale (α = .74), Extrinsic Goals subscale (α = .62), and Task Value subscale (α = .90) all of which were originally meant to measure student motivation for learning based on the general expectancy-value model of motivation (Pintrich, Smith, Garcia & McKeachie, 1991).

The MSLQ was validated over several waves of data collection. In its latest version, confirmatory factor analysis was used with a 7th-grade sample of students. The developers of the instrument claim that the alpha coefficients for the MSLQ scales are robust and demonstrate good internal consistency (Pintrich et al., 1993). Cronbach's alpha for the current sample was .89.

Goal-oriented self-regulation. The short version of the SOC-questionnaire (Domain-General version) devised by Baltes, Baltes, Freund, and Lang (1999) originally in German, was used to assess adolescents' decision-making processes. An adapted English version was

published in 2002 showing alphas ranging from 0.25 to 0.66 for adults only (Geldhof et al, 2014). Previous research also shows relatively low alphas in terms of reliability for adolescents in elementary schools (1st to 5th Grade). This is because the measure includes a subscale measuring "Loss-Based Selection", a construct few children that age may have experienced or are unable to report maturity-wise (Getsdottier & Lerner, 2007). Follow-up studies found that respondents are old enough for the measure to be a reliable indicator of decision-making processes at grade ten, and when all subscales are combined (α= .62; Geldhof et al, 2014). Evidence suggests using the SOC as a single factor model proves a better measure.

Therefore, the short version (9-item version, 2 items are reverse coded) will be given to the current sample. Even though Geldhof, Bowers, and Napolitano (in press) indicated that the scale might be more useful when given in Likert-type response format, such a scale is not available yet. Thus, participants were presented with the response style format of the original version, which lets them choose between "Person A" and "Person B". Students were instructed to choose which one the two statements given they identify most with (e.g., "I concentrate on few things" versus "I divide my energy among many things"). Higher scores (on a scale of 0 - 9) represented higher identification with the SOC-construct. The Cronbach's alpha for the current sample was .95.

Microsystem level measures. Measures of Parent pro-educational attitudes, peer academic orientation, school climate, and neighborhood structure are described next.

Parents pro-educational attitudes. The Attitudinal sub-scale (7 items) of the Adolescent Perceptions of Parental Pro-Educational Attitudes and Behaviors Scale was used. The measure sets out to obtain information about parental expectations for school performance and attainment, parental values about academics, and educational aspirations parents might hold and have communicated to their child (Herlickson et al., 2009). Only student perceptions about parental

attitudes were measured. Response options are a 5-point Likert-type scale ranging from 1 (*not at all*) to 5 (*completely*). A combined score of 35 indicates that parents hold no positive attitudes about the importance of education for their child, while a minimum score of 7 describes children that have parents with many pro-educational attitudes. All items on the attitudinal scale are negatively worded. Sample items include "My parent(s) think that the skills I'm learning in school will NOT help me succeed in the 'real world' and "My parent(s) feel that the system in which I am being educated is flawed in many ways".

During test development, the scale showed strong psychometric properties. Test-retest reliability was very good (r = 0.85). The scale has a satisfactory Cronbach's Alpha (α = .82), while internal consistency estimates for the Attitudinal scale were r = .68 (Herlickson et al., 2009). Additionally, Herlickson et al. (2009) found good convergent and divergent validity, especially with measures that tapped into overall parenting, parental monitoring, and parental social support. The sample used for test development was adequately diverse, above sixth-grade reading level, therefore, the test is appropriate for high school students. The Cronbach's alpha for the current sample was .73.

Peers' academic orientation. Influences from peers that may make a difference in how children perform were measured with two constructs from the LEAG (Learning Gardens Educational Assessment; Skinner & Chi, 2011). The two sub-scales were specifically assembled to understand how immediate academic engagement and perceived peer support influences academic achievement (Furrer, Skinner, & Pitzer, 2014).

Sample questions are included, "My friends work hard at school" (for the Friends' Engagement in School Scale, 7 items) and "My friends and I learn better when we study together" (Friends' Support for Engagement in School, 3 items). Response options were on a 5 point Likert-type scale ranging from 1 *(not at all true*) to 5 (*totally true*). Furrer, Skinner, and

Chi (2011) reported overall Cronbach's alpha for the scale of .85, but individual alphas were not reported. The scale should, therefore, be used as a combined measure of peer's academic orientation. The developers of the scale reported good measurement properties, such as good convergent validity. The Cronbach's alpha for the current sample was .89 for the overall scale. The Cronbach's alpha for the sub-scale Friends' Engagement in School Scale was $\alpha = .87$ and for Friends' Support for Engagement in School was $\alpha = .71$.

School climate. The students' perceptions of the quality of their school experiences, such as the norms, goals, values, relationships with adults, teaching and learning experiences, as well as organizational and leadership practices within a school, all fall under the larger construct of school climate (National School Climate Counsel, 2007; Center for Disease Prevention, 2009, 2010). These were measured by the School Climate Perceptions Scale constructed by O'Mally, Voight, Renshaw, and Eklund (2014). The scale was originally constructed in response to the Drug-Free Schools and Community Acts to capture perceptions of students (Clifford et al., 2012). It is a shorter version adapted from a large research project understanding resilience, schools, and community supports called California Health Kids Survey (CHKS; O'Malley & Hanson, 2012). The shortened scale was composed of four subscales: Relationships with Adults at School (6 items), Opportunities for Meaningful Participation in School (3 items), Perceived School Safety (2items), and School Connectedness (4 items).

The first 14 item were on a 5-point Likert-type scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), while one item ("How safe do you feel when you are at school?") used the response options 1 (*very unsafe*) to 5 (*safe*). Scales were averaged via a weighted percentage as recommend by test developers with higher scores indicating better student perception of school climate.

Psychometric properties of the scales varied. For the School Connectedness scale, Furlong, Ritchey, and O'Brennan (2009) found alpha coefficient ranging from .82 to .87 for a variety of socio-cultural groups (e.g., black, white, American Indian, Asian) and concurrent validity score ranged from .47 to .55. Internal consistency was found to be at r = .78 (Sharkey, You, & Schnoebelen, 2008). The Relationships with Adults at School scale showed good reliability (α = .90) and internal consistency exceeding α = .9 (Hanson & Kim, 2007). However more recently O'Mally, Voight, Renshaw, and Eklund (2014) reported a slightly lower Cronbach's alpha (α = .88).

The Perceived School Safety scale and Opportunities for Meaningful Participation at School scale both had acceptable alphas (α = .75 and α = .69) (Madsen, 2011; Sharkey, You, & Schnoebelen, 2008). Reliability in terms of race and gender for these scales ranged from 0.75 to .91, with lower estimates for Latino Americans, and greater validity for youth above the age of 14 years (Furlong, Ritchey, & O'Brennan, 2009). Good stability and validity of scores were reported for all scales (Hanson & Kim, 2007). Cohen, McCabe, Michelli, & Pickeral, (2009) suggested in a review of school climate measures that all good survey instruments of school climate should include dimensions of relationships, connectedness, and safety in schools, even though school climate is a relatively new and complex construct. Measures used in this study are similar to the ones suggested by Cohen et al., (2009). The Cronbach's alpha for the current sample was .90 for the overall School Climate Measure. The Cronbach's alpha for the sub-scale Relationships with Adults at School was α. = .90, Opportunity for Meaningful Participation at School was α. = .76, Perceived School Safety was α. = .83, and School Connectedness was α. = .78 for the current sample.

Neighborhood structure. Student perceptions of their immediate surroundings, neighborhood space, access to safe and enjoyable activities were also measured with the patterns

of Adaptive Learning Scale (PALS). The Neighborhood Structure subscale of the PALS included six items, two of which were reversed. Sample questions included, "In my neighborhood, I have trouble finding safe places to hang out with my friends" and "In my neighborhood, there are places I can go to play outdoors and have fun".

Reliability for the Neighborhood Structure subscale produced a Chronbach's alpha of .76 (Midgley et. al, 2000). Overall reliability, validity, scoring, and response options were same as for the Self-Efficacy Scale earlier described. The Cronbach's alpha for the current sample was .72.

Mesosystem level measure: ***Parent-teacher/ parent-school communication.*** The Parent-Teacher Involvement Questionnaire (parent version) was used to assess the amount and type of contact that occurred between parents and teachers (Corrigan, 2002). Only items pertaining to direct contact between parent and teacher and parent and school were used. The questions were adapted to assess adolescents' perception of their parents' communication behaviors, because only limited instruments currently exist for this specific construct. Response options lay on a 5-point Likert-type scale ranging from 1 (*never*) to 5 (*more than once per week*). Alpha coefficients were satisfactory for a normative sample ($\alpha = 0.82$), and slightly lower for high risks students ($\alpha = .74$). Sample items include "My parent(s) call(s) my teachers" and "My parent(s) have written my teacher". The Cronbach's alpha for the current sample was .79.

Outcome measure: ***Academic achievement.*** Student achievement, attainment of learning objectives, and the acquisition of desired skills and competencies is generally called academic or student achievement (York, Gibson, & Ranking, 2015), and was measured in this study by self-reported Grade Point Average (GPA) in four subjects: Math, English, Social Sciences, and Science. Overall student GPA was calculated manually from the average of the

four reported subject areas, mimicking the actual GPA scale used in American high schools (A+ = 4.0, ..,C- = 2.0, D = 1, F = 0).

Procedure

After seeking approval from the Internal Review Board (IRB) at Wayne State University, the researcher mailed a parental information sheet with an option to decline participation in research to each household two weeks prior to the date of data collection. Parents who did not want their child to participate in the study were asked to return the signed form to the school. Within the information and consent sheet, the parents were informed of the purpose of the study, procedures, risks, benefits, as well their right for confidentiality, and that the school was to receive a $250 cash donation to their media/ library room for allowing the researcher to approach the students within the school.

The students themselves were then asked to give their assent twice before filling in the surveys. Students first provided oral assent after the researcher read a script with instructions to the students. A second opportunity was provided on the research information sheet stapled on top of each survey package. Students who chose to opt out of the study had the option to pursue a self-selected quiet activity within the classroom or leave for the school library. The students who assented were asked to complete the survey within one class session (45 minutes) while being supervised by the teacher and the researcher. Teachers received a gift card for their efforts and students received a candy incentive.

Students were asked to deposit their surveys in a large brown envelope after completion. To ensure additional anonymity, the research information and assent sheet was stapled as a cover over the survey so neither the teacher nor the other students were able to see answers (or if the student chose not to answer). Surveys were anonymous.

Data Analysis

After all the data was entered into a computer file and the main analysis was executed via SPSS (IBM SPSS version 23). The conventional criterion alpha level of .05 was used to determine whether or not significance between variables was present. Multiple Regression Analysis was selected for the primary analyses, as it is one of the most widely used dependence techniques when researchers aim to examine the relationship between a single metric independent variable (criterion) and several metric dependent variables (predictors) (Hair, Black, Babin, & Anderson, 2010). It is also a dependence technique than can provide both prediction and explanation to the researcher as multiple regressions also allow for a comparison of the relative importance of each variate. With N = 300 and 8 predictor variables entered into the analysis optimal levels of power of 0.8 can be achieved at a significance level of 0.05(Green, 1991). Incomplete cases (more than 50% missing) or those that showed obvious carelessness or random responding were excluded from the analyses. Only surveys that had complete response profiles on the demographics sheets were used.

Preliminary analyses. ANOVAs were run to check if differences between certain groups existed to determine whether to control for signifcant factors throughout the analysis. Group characteristics that were examined through ANOVAS were gender, ethnicity, SES, and students' grade they were enrolled in.

Main analyses. The theoretical model proposed by the researcher called for a hierarchical linear model (HLM) because observations fell into nested levels (i.e. intra-personal factors, microsystem factors, macrosystem factors, and mesosystem factors). Gender, race, and SES were controlled for. Predictor variables for each domain were entered sequentially, with those variables that needed to be controlled for entered at Step 1 of the model.

The researcher's goal was to see which aspects of the adolescent's environment were most predictive of academic achievement. For each significant predictor, simple slope analyses were conducted to assess for interactional effects. Linearity, normality, and independence of residuals were detected through simple slope analysis of residuals, and no significant effects were found. Additionally, not outliers were identified. Normality of the independent variable was assessed and did not need to be corrected for. Variance Inflation Factors (VIF) for all predictors fell within the normal range with minimal multicollinearity, suggesting the results can be interpreted with confidence.

Moderation analyses. The second set of analyses focused on answering research questions 4 and 5. Question 4 asked whether school climate moderated the relationship between a) SES and academic engagement and b) SES and academic achievement. Question 5 asked whether school climate moderated the association between a) neighborhood structure and academic engagement and b) between neighborhood structure and academic achievement.

For these analyses, an interaction term between the moderator variable and predictor variable was created and entered at Step 2 in the hierarchical regression model (HML). At step one both predictor variables and all control variables were entered. Moderation was indicated if (a) both models were significant, and (b) the amount of variance was significantly more in the model with the interaction term than the model without the interaction term (R^2 change is observed). If moderation was detected, beta-weights, means, and standard deviations were entered into an excel file by Bing and LeBrenton (1991) to graph the continuous interaction between terms (Cohen & Cohen, 1983). For a detailed overview of the statistical analyses see Table 3.

Table 3

Statistical Analyses

Research Questions/ Hypotheses	Variables	Statistical Analysis
Preliminary Analyses: Analysis of Variance procedures were run on all scaled variables to detect differences by gender, grade level, socioeconomic status, and ethnicity.		
Main Study Analyses:		
1. (a) What is the combined strength of the intrapersonal variables in explaining variance in academic achievement? (b) What is the relative contribution of each variable – are some stronger predictors than others?		
H_{1a}: The combination of these predictor variables will explain a significant proportion of variance in each of the criterion variables. H_{1b}: The contribution self-efficacy and the academic engagement variables are expected to be strongest.	Criterion Variable • Academic achievement Predictor Variables • Self-efficacy • Behavioral engagement • Behavioral disengagement • Intrinsic value for learning • Goal-oriented self-regulation	One multiple linear regression analysis (hierarchical modeling) was used to determine which of the predictor variables are statistically significant predictors of the criterion variable. Control variables were entered at step 1, predictor variables at step 2.
2. (a) What is the combined strength the microsystem variables in explaining variance in academic achievement? (b) What is the relative contribution of each microsystem variable – are some stronger predictors than others? (c) What is the relative contribution of the microsystem variables above and beyond the intrapersonal variables?		
H_{2a}: The combination of these predictor variables will explain a significant proportion of variance in each of the criterion variables. H_{2b}: The contribution of parents' pro-educational attitudes and school climate variables are expected contribute strongest. H_{2c}: Intrapersonal variables are expected to explain the largest amount of variance followed by the microsystem variables.	Criterion Variable • Academic achievement Predictor Variables (Step2) • Self-efficacy • Behavioral engagement • Behavioral disengagement • Intrinsic value for learning • Goal-oriented self-regulation Predictor Variables (Step3) • Parents' pro-educational attitudes • Peers' academic engagement • Peers' academic support • Relationship with adults • Opportunity for meaningful participation at school • Perceived school safety • School connectedness • Neighborhood structure	One multiple linear regression analysis (hierarchical modeling) was used to determine which of the predictor variables are statistically significant predictors of the criterion variable. Control variables were entered at step 1, interpersonal predictor variables at step 2, and microsystem predictor variables at step 3.

3. (a) What is the combined strength of the intrapersonal and microsystem and macrosystem variables in explaining the variance in academic achievement?
   (b) What is the relative contribution of each set of intrapersonal variables, microsystem variables, and the macrosystem variable? Do the latter add explanation of variance beyond the former?

H_{3a}: The combination of these predictor variables will explain a significant proportion of variance in each of the criterion variables.

H_{3b}: Intrapersonal variables are expected have to explain the largest amount of variance when combined followed by microsystem variables, followed by the macrosystem variable.

Criterion Variable
- Academic achievement

Predictor Variables (Step2)
- Self-efficacy
- Behavioral engagement
- Behavioral disengagement
- Intrinsic value for learning
- Goal-oriented self-regulation

Predictor Variables (Step3)
- Parents' pro-educational attitudes
- Peers' academic engagement
- Peers' academic support
- Relationship with adults at school
- Opportunity for meaningful participation at school
- Perceived school safety
- School connectedness
- Neighborhood structure

Predictor Variable (Step4)
- Parent-teacher-school communication

One multiple linear regression analysis (hierarchical modeling) was used to determine which of the predictor variables are statistically significant predictors of the criterion variable. Control variables were entered at step 1, interpersonal predictor variables at step 2, microsystem predictor variables at step 3, and mesosystem predictor variable at step 4.

4. (a) Does school climate moderate the association between SES and academic engagement?
   (b) Does school climate moderate the association between SES and academic achievement?

H_{5a}: The relation between SES and academic engagement can be moderated by school climate.

H_{5b}: The relation between SES and academic achievement can be moderated by school climate.

Criterion Variables
- (a) Academic engagement
- (b) Academic achievement

Predictor Variable
- SES

Moderator Variable
- School climate

One multiple linear regression analysis was used to determine if school climate was moderating relations between SES and academic engagement or academic achievement. An interaction term (product term) was created between school climate and SES and entered in the hierarchical regression model to observe a change in the variance explained. Strengths of the direction of interaction were observed through graphing residuals and SDs.

5. (a) Does school climate moderate the association between neighborhood structure and academic engagement?
   (b) Does school climate moderate the association between neighborhood structure and academic achievement?

H_{6a}: The relation between neighborhood structure and academic engagement can be moderated by school climate. H_{6b}: The relation between neighborhood structure and academic achievement can be moderated by school climate.	Criterion Variables • (a) Academic engagement • (b) Academic achievement Predictor Variable • Neighborhood structure Moderator Variable • School climate	One multiple linear regression analysis was used to determine if neighborhood structure was moderating relations between SES and academic engagement or academic achievement. An interaction term (product term) was created between school climate and SES and entered in the hierarchical regression model to observe a change in the variance explained. Strengths of the direction of interaction were observed through graphing residuals and SDs.

CHAPTER 4 - RESULTS

The purpose of this study was to examine the relationships between multiple intrapersonal, microsystem, and macrosystem factors and academic achievement. Most scales were evenly distributed around the mean. Similarly, within almost all scales the actual minimum and maximum scores were close to possible minimum and maximum scores. The only noteworthy diversion was within the Parent-Teacher Involvement Scale in which the possible range maximum score was 8.00 - 40.00, but the actual range was between 8.00 - 33.00, indicating the students reported parents less involved than the maximum possible given options within the survey (n = 306, M = 13.28, SD = 3.96).

For the dependent measures, students reported grades as low as 1.00 (0.6%, n = 2) and as high as 4.00 (1.6%, n = 6). The average GPA was M=2.99 with an SD = 0.55 (n = 299). More specifically, 31 students (10.4%) achieved a grade point average of A- or higher and 124 (41.4%) students achieved a grade point average of B (including B+ and B). There were 123 (41.2%) students that received a C+, C, or C-, and finally, 21 (7.0%) students that received grades below D+. Means and standard deviations for all variables are included in Table 4.

Student academic risk behaviors were measured by self-reported frequencies of tardiness to class and number of unexcused absences. Few students reported that they were never late and never had an unexcused absence (n=20, 6.4%) and few students reported that they were late several times a day and had several unexcused absences (n=6, 1.9%). Most students reported being tardy and/or unexcused a few times a month (M=5.37, SD=1.86).

Table 4

Descriptive Statistics for the Study Variables

				Actual Range		Possible Range	
Scale	*N*	*M*	*SD*	Min	Max	Min	Max
Academic Self-efficacy (PALS)	303	18.66	7.00	5.00	25.00	5.00	25.00
Engagement vs. Disaffection with Learning Survey	308	29.44	4.87	14.00	40.00	10.00	40.00
Behavioral Engagement	308	15.16	2.93	7.00	20.00	5.00	20.00
Behavioral Disengagement	308	14.28	2.70	6.00	20.00	5.00	20.00
Intrinsic Value subscale of the Motivated Strategies for Learning Questionnaire (MSLQ)	303	30.88	7.00	11.00	45.00	9.00	45.00
Selection-Optimization-Compensation Questionnaire (Domain-General version)	280	5.33	1.84	1.00	9.00	0.00	9.00
Adolescent Perceptions of Parental Pro-Educational Attitudes and Behaviors Scale	296	27.62	5.07	7.00	35.00	7.00	35.00
Peers Academic Orientation. Scale (LEAG)	305	34.04	8.98	10.00	50.00	10.00	50.00
Friends' Engagement in School Scale	305	9.50	2.78	3.00	15.00	3.00	15.00
Friends' Support for Engagement in School	305	24.54	6.90	7.00	35.00	7.00	35.00
School Climate Perceptions Scale (weighted Score)	305	3.21	0.76	1.00	5.00	1.00	5.00
Relationships with Adults at School	305	92.99	23.70	25.00	125.00	25.00	125.00
Meaningful Participation in School	305	70.85	25.56	25.00	125.00	25.00	125.00
School Connectedness	305	73.46	24.40	25.00	125.00	25.00	125.00
Perceived School Safety	305	83.28	24.29	25.00	125.00	25.00	125.00
Neighborhood Structure subscale (PALS)	302	18.80	5.31	6.00	30.00	6.00	30.00
Parent-Teacher Involvement Questionnaire	304	13.28	3.96	8.00	33.00	8.00	40.00
Academic Achievement (GPA self-reported)	299	2.99	0.55	1.00	4.00	1.00	4.00
Academic Risk Behavior	308	5.37	1.86	2.00	10.00	2.00	10.00

Next, Pearson product moment correlations were run to examine strength and direction of the associations among the scaled variables (see Table 5).

Table 5

Pearson Product Moment Correlations – Scaled Variables

	Variables										
	1	2	3	4	5	6	7	8	9	10	11
1											
2	.39**										
3	.53**	.48**									
4	.23**	.34**	.26**								
5	.08	.18**	.13*	.04							
6	.27**	.36**	.37**	.14*	.02						
7	.29**	.39**	.55**	.20**	.06	.44**					
8	.17**	.15*	.25**	.13*	-.04	.20**	.17**				
9	.12*	.07	.20**	-.03	-.21**	.13*	.27**	.05			
10	.47**	.34**	.32**	.25**	.17**	.17**	.26**	.05	.13*		
11	-.14*	-.31**	-.23**	-.05	-.10	-.06	-.15**	-.03	-.08	-.08	

*$p \leq .05$; **$p \leq .01$

Intrapersonal Variables: 1 Academic Self-efficacy; 2 Academic Engagement; 3 Intrinsic Value for Learning; 4 Goal-oriented self-regulation. **Microsystem Variables:** 5 Parents Pro-Educational Attitudes; 6 Peers Academic Orientation; 7 School Climate, 8 Neighborhood Structure. **Mesosystem Variables:** 9 Parent-teacher/ parent-school communication. **Outcome Variables:** 10 Academic Achievement, 11 Academic Risk Behavior

Variables were generally correlated and in the expected directions. Strong correlations existed between the intrapersonal variables academic self-efficacy and intrinsic value for learning ($r = .53$, $p < .001$). A significant association also existed between academic engagement and intrinsic value for learning ($r = .48$, $p < .001$), suggesting that a generally positive attitude towards learning can be observed across several characteristics within an individual. Moderate correlations existed between academic self-efficacy ($r = .39$, $p < .001$) and goal-oriented self-regulation and academic engagement($r = .34$, $p < .001$). All other correlations at this level were small but significant at alpha levels of .001.

Intrinsic value for learning and overall school climate were strongly correlated (r = .55, p < .001). School climate showed moderate to small correlations with all variables except for student report of their parents' attitude to learning. As expected, a positive school climate was negatively correlated with academic risk behaviors (r = -.15, p < .001).

An unexpected correlation in terms of directionality emerged between parent-school and parent-teacher communication and parent's pro-educational attitudes (r = -.21, p < .001). This correlation indicated that students who perceived their parents to more frequently communicate with their teachers tended to have less positive attitudes towards education. A significant implication of this finding might be the parents with children that have problem behaviors may actually communicate with schools and teachers more than those that have children that do well in school.

As expected, academic risk behavior was negatively correlated with all variables. A moderate negative correlation existed between academic risk behavior and intrinsic value for learning (r = -.31, p < .001), and small but significant correlations existed between academic risk behavior and self-efficacy (r = -.14, p < .001), intrinsic value for learning (r = -.23, p < .001), and school climate (r = -.15, p < .001).

Preliminary Analyses

Preliminary Analyses were run using ANOVAs to determine if differences in the study variables existed by gender, race or ethnicity, and grade level. First, an ANOVA was run for all scales and subscales by gender. There were significant differences by gender within the intrapersonal variables for academic engagement, F (1, 286) = 14.7, p = .000 and students' intrinsic value for learning, F (1, 281) = 4.1, p = .045. There were also gender differences for two microsystem variables: perceived peer academic orientation, F(1, 284) = 17.7, p = 0.000, and relationships with adults at school (part of school climate), F(1, 284) = 14.7, p = 0.000.

Parent-teacher and parent-school communication also differed by gender at the mesosystem level, F (1,282) = 10.5, p = .001. Male students (M = 14.01, SD = 4.740) reported their parents to be significantly more involved than females (M = 12.53, SD = 2.89). Contrary to this, females (M = 30.69, SD = 4.86) reported higher levels of academic engagement than males (M = 28.31, SD = 4.80), and also higher levels of intrinsic value for learning (males: M = 30.02, SD = 7.10; females: M = 31.69, SD = 6.84), as well as higher levels of positive relationships with adults at school (males: M = 87.20, SD = 24.74; females: M = 97.84, SD = 21.67), and more positive peer group involvement (males: M = 31.52, SD = 9.31; females: M = 35.92, SD = 8.49). Because there were significant gender differences for five of the eleven variables, the main analyses were controlled for by gender.

A second set of ANOVAs were run with all scales and subscales to understand if differences existed between groups African American and Latino students. Differences were found among intrapersonal variables, including behavioral academic engagement, F(1,270) = 5.03, p = .040, and intrinsic value for learning, F(1,268) = 3.91, p = .049. Several differences were also found for the microsystem variables. Those were perceived parental pro-educational attitudes, F(1,261) = 10.78, p = .001, the student perception of peer academic orientation, F(1,270) = 5.16, p = .024, school connectedness, F(1,271) = 14.50, p = .000, school safety, F(1, 271) = 6.89, p = .009, and overall school climate, F(1,271) = 5.60, p = .019. Differences by ethnicity were also found for academic achievement, F(1,267) = 10.54, p = .001, and academic risk behavior, F(1,273) = 19.88, p = .000. Students with Latino background reported higher overall grades (M = 3.17, SD = .55) than African American students (M = 2.91, SD = .54).Latino students also reported lower incidents of academically risky behavior (M = 7.76, SD = 1.99) than their African American fellow students (M = 9.24, SD = 2.46). Consistent with these findings, Latino students generally reported higher levels of positive

characteristics related to learning and school achievement on measures on which significant differences were found. Latino students (M = 3.39, SD = .78) also perceived overall school climate more positively than their African American school mates (M = 3.14, SD = .75). Ethnicity was controlled for in the main analyses due to these significant effects.

A third set of ANOVAs were run to see if differences existed by grade level. Significant differences by grade level were found for student perception of overall school climate, $F(3, 304) = 2.97$, $p = .032$, school connectedness, $F(3, 304) = 2.96$, $p = .033$, perceived parent-teacher and parent-school communication, $F(3, 303) = 2.98$, $p = .032$, and average GPA, $F(3, 298) = 3.66$, $p = .013$. Post-Hoc tests using Bonferroni revealed that significant differences existed between grade 9 (M = 2.86, SD = .63) and grade 12 (M = 3.14, SD = .55) in that students enrolled in 12th grade reported higher average grades. Differences by grade in the reported school climate existed between grades 10 and 12, in that 12 graders (M = 3.42, SD = .68) reported a more positive school climate than 10th graders (M = 3.09, SD = .76). Similarly 12th graders (M = 80.03, SD = 21.34) reported higher levels of school connectedness than 10th graders (M = 69.31, SD = 26.21). Grade level was controlled for in the main analyses due to the detection of significant main effects from this variable.

Correlations between SES and all predictor variables generally yielded very low to no correlations. Therefore, SES for this study was not entered as a control variable for the main analyses. Significant but low correlations were found between SES and parental involvement (r = .19, $p < .005$), intrinsic value for education (r = .16, $p < .007$), neighborhood structure (r=-.14, $p < .023$), and academic engagement (r = .17, $p < .005$). Results suggested that students who lived in a household with higher SES status held higher values for education, received more parental involvement, were more academically engaged, and also reported a neighborhood

structure with better resources as compared to other students enrolled in this study. Because all correlations were below $r = 0.2$, SES was not entered as a control variable.

Primary Analyses

A Hierarchical Linear Regression was run for all analyses. Control variables were entered in step 1. In the second step, microsystem variables were entered, and the mesosystem variable was entered in the third step. Specific interactional processes were conceptualized as moderation and were addressed in research questions 5 and 6.

Research question 1. (a) What is the combined strength of the intrapersonal variables, namely academic self-efficacy, academic engagement (behavioral engagement and behavioral disengagement), intrinsic value for learning, and goal-oriented self-regulation, in explaining variance in academic achievement? (b) What is the relative contribution of each variable – are some stronger predictors than others?

One hierarchical linear regression analysis was used to determine which of the predictors statistically explained a significant amount of variance in the criterion variable — academic achievement. Gender, grade, and race/ethnicity were entered simultaneously at step 1 as covariates. The intrapersonal variables (self-efficacy, behavioral engagement, behavioral disengagement, intrinsic value for learning, and goal-oriented self-regulation) were entered at step 2.

The covariates alone were not significant predictors of academic achievement, F (3,258) = 2.50, p = .060 and only accounted for 2.8% of the variance in the criterion variable. The intrapersonal variables entered at step 2 were significant. The intrapersonal variables accounted for 27% percent of additional variance beyond control variables ($\Delta R^2 = 0.27, F(5, 253) = 19.15, p < .001$), which was a significant increase from step 1. Self-efficacy explained the largest amount of variance in the criterion variable contributing about 11.2% to students' academic achievement

(β = .34, t = 5.40, p < .001) when all other predictors were held constant. The unique variance explained by each predictor in this model was the squared semi-partial correlation, which is also the variance explained above and beyond all other predictors in the model. Similarly, academic engagement explained about 2.7 % of the variance in the criterion variable (β = .18, t = 2.67, p = .008) when all other predictors were held constant. Behavioral disengagement, intrinsic value for learning, and goal-oriented self-regulation were not significant predictors. Table 6 shows the results of the regression analysis.

Table 6

Hierarchical Linear Regression Model – Intrapersonal Variables Explaining the Variance in Academic Achievement

	Covariates			Step 1		
Variable	*B*	*B*	t-Value	*B*	*β*	t-Value
Grade Level	.06	.12	1.95	.63	.13	2.48*
Ethnicity	.05	.12	1.97	.04	.09	1.73
Gender	.01	.06	.15	-.05	-.05	-.95
Self-efficacy				.04	.34	5.40**
Behavioral engagement				.03	.18	2.67*
Behavioral disengagement				.01	.03	.46
Intrinsic value for learning				.00	.04	.60
Goal-oriented self-regulation				.03	.09	1.49
R^2		.03			.30**	
$R^2\Delta$		.03			.27**	
F Δ in R^2		2.50			19.15**	
Df		3, 258			5, 253	

*$p \leq .05$; **$p \leq .01$

Research question 2. (a) What is the combined strength of the microsystem variables (parent pro-educational attitudes, peer academic orientation [peer engagement & peer support], school climate [relationship with adults, opportunity for meaningful participation, perceived

school safety, and school connectedness], and neighborhood structure) in explaining the variance in academic achievement? (b) What is the relative contribution of each microsystem variable – are some stronger predictors than others? (c) What is the relative contribution of microsystem variables above and beyond the intrapersonal variables?

A hierarchical linear regression analysis was used to determine which of the predictor variables statistically significantly explained variance in the criterion variable when the microsystem variables were entered. **P**arent pro-educational attitudes, peer engagement, peer support, relationship with adults, the opportunity for meaningful participation, perceived school safety, school connectedness, and neighborhood structure were simultaneously entered at step 2.

The covariates were a significant predictors of academic achievement, F (3,263) = 2.85, p = .038 and accounted for a small (3.2%) but significant part of explained variance in academic achievement (R^2 = 3.2, p = .038). The microsystem variables entered at step 2 were also significant and accounted for 11.5% percent of additional variance above and beyond the control variables (ΔR^2 = 0.12, F(8, 252) = 2.96, p < .004). Parent pro-educational attitudes explained the largest amount of variance in the criterion variable contributing about 1.77% to students' academic achievement (β = .13, t = 2.13, p < .04) when all other predictors were held constant. The unique variance explained by each predictor in this model was the squared semi-partial correlation, which is also the variance explained above and beyond all other predictors in the model.

Next the microsystem variables were added on top of the macrosystem variables, to understand which microsystem variables explained variance above and beyond intrapersonal variables. This did not produce significant changes in the model, F (11, 237) = 1.49, p = .162. Intrapersonal variables continued to explain a significant amount of variance in the outcome variable. That is self-efficacy (β = .37, t = 5.73, $p \leq .000$) and behavioral engagement (β = .18, t

= 2.41, p = .017) remained significant explanatory variables for student academic achievement. Table 7 shows the results of the regression analysis.

Table 7

Hierarchical Linear Regression Model – Intrapersonal Variables and Microsystem Variables Explaining the Variance in Academic Achievement

	Step 1 Covariates			Step 2 Microsystem Variables			Step 3 Intrapersonal and Microsystem Variables		
Variable	*B*	*β*	t-Value	*B*	*β*	t-Value	*B*	*β*	t-Value
Grade Level	.06	.12	1.95	.03	.13	2.08*	.06	.14	2.47*
Ethnicity	.05	.12	1.97	.04	.09	.07	.03	.08	1.38
Gender	.06	.06	.15	.01	.01	.12	-.06	-.07	-1.13
Self-efficacy							.04	.37	5.73**
Behavioral engagement							.03	.18	.02*
Behavioral disengagement							.01	.04	.58
Intrinsic value for learning							.00	.03	.36
Goal-oriented self-regulation							.03	.09	1.58
Parents' pro-educational attitudes				.02	.13	2.13*	.01	.14	2.46*
Relationship with adults				.02	.13	1.62	.00	.02	.22
Opportunity for meaningful participation				.00	.04	.46	.00	-.07	-.94
Perceived school safety				.00	.12	1.61	.00	.09	1.34
School connectedness				.00	.02	.20	.00	.02	.23
Peers' academic engagement				.00	.03	.34	.00	-.02	-.19
Peer support				.00	.01	.12	-.01	-.03	-.48
Neighborhood structure				.00	.00	.00	.00	-.04	-.70
R^2	.03			.12**			.34*		
$R^2\Delta$	.03			.08**			.03		
F Δ in R^2	2.50			2.96**			1.49		
Df	3, 258			8, 252			16, 241		

*$p \leq .05$; **$p \leq .01$

Research question 3. What is the combined strength of intrapersonal variables, microsystem variables, and the macrosystem variable in explaining the variance in academic achievement? (b) What is the relative contribution of each set of intrapersonal variables, microsystem variables, and the macrosystem variable combined? Do the latter add explanation of variance beyond the former?

Again, hierarchical linear regression analysis was used to determine if the variable explained a significant amount of variance in the outcome. Adding the macrosystem variable parent-teacher /parent-school communication did not make a significant change to the model, F (1, 236) = 2.10, p = .149. The macrosystem variable explained only 0.6%, (R^2 = .01, p = .149) of the variance in student achievement, which was not statistically significant (see Table 8).

Table 8

Hierarchical Linear Regression Model – Intrapersonal Variables, Microsystem Variables, and Macrosystem Variable Predicting Academic Achievement

	Step 2 Microsystem Variables			Step 3 Intrapersonal & Microsystem Variables			Step 4 Intrapersonal, Microsystem & Macrosystem Variable(s)		
Variable	*B*	*β*	t-Value	*B*	*β*	t-Value	*B*	*β*	t-Value
Grade Level	.63	.13	2.48*	.064	.14	2.47*	.06	.13	2.31*
Ethnicity	.04	.09	1.73	.03	.08	1.38	.03	.08	1.51
Gender	-.05	-.05	-.95	-.06	-.07	-1.13	-.05	-.05	-.86
Self-efficacy				.04	.37	5.73**	.04	.38	5.72**
Behavioral engagement				.03	.18	.02*	.03	.17	2.35*
Behavioral disengagement				.01	.04	.58	.01	.04	.57
Intrinsic value for learning				.00	.03	.36	.00	.02	.26
Goal-oriented self-regulation				.03	.09	1.58	.03	.10	1.8
Parents' pro-educational attitudes	.02	.13	2.13*	.01	.14	2.46*	.02	.16	2.75**
Relationship with adults	.02	.13	1.62	.00	.02	.22	.00	.00	.20
Opportunity for meaningful participation	.00	.04	.46	.00	-.07	-.94	.00	-.08	-1.13
Perceived school safety	.00	.12	1.61	.00	.09	1.34	.00	.09	1.42
School connectedness	.00	.02	.20	.00	.02	.23	.00	.00	.01
Peers' academic engagement	.00	.03	.34	.00	-.02	-.19	.00	-.02	-.26
Peer support	.00	.01	.12	-.01	-.03	-.48	-.01	-.03	-.69
Neighborhood structure	.00	.00	.00	.00	-.04	-.70	.00	-.03	-.60
Parent-teacher/ parent-school communication							.01	.09	1.45
$R^2\Delta$		.08**			.03			.01	
F Δ in R^2		2.96**			1.49			2.10	
Df		8, 252			16, 241			1, 236	

*$p \leq .05$; **$p \leq .01$, 1st Level of Analysis with Covariates was omitted in the table for clarity purposes

After completion of analyses for research question three, a series of á posteriori analyses were run to explore whether there were differences in explained variance when scale totals are used instead of individual subscales. Also, if differences are observed, what are these, and which combined scales explain the relative variance in academic achievement?

Differences in variance explained by academic achievement were minimal when total scales instead of the individual subscales were used. The covariate grade level appeared to remain significant (β = .13, t = 2.29, p = .023). As found in previous analyses, the intrapersonal variables self-efficacy (β = .37, t = 5.79, $p \leq .000$) and overall academic engagement (β = .16, t = 2.32, p = .021) were significant contributors in explaining outcomes in academic achievement. The microsystem variable parents' pro-educational attitudes (β = .17, t = 2.94, p = .004) was also significant which is also consistent with previous analyses. No other variables made a significant contribution in explaining variance in academic achievement.

As for the changes in the model at each step, the only significant improvement for the overall model was achieved was when the intrapersonal variables were added, F (4, 246) = 24.28, $p \leq .000$, explaining 28.3% of the variance in academic achievement (ΔR^2 = .28, $p \leq .000$). This is also consistent with what was found in analyses were sub-scales of test scores were used. Contrary to the hypotheses, adding the additional microsystem levels (at step 3), ΔR^2 = .01, $p \leq .202$, and macrosystem levels (at step 4), ΔR^2 = .03, $p \leq .061$, did not make significant changes to the model. See Table 9 for a detailed comparison.

Table 9

Hierarchical Linear Regression Model – Comparison between Sub-Scales and Full Scales

	Full Model with sub-scales			Full Model with Composite Scores			
Variable	*B*	*β*	t-Value	*B*	*β*	t-Value	Variable
Grade Level	.06	.13	2.31*	.06	.13	2.29*	Grade Level
Ethnicity	.03	.08	1.51	.03	.09	1.56	Ethnicity
Gender	-.05	-.05	-.86	-.05	-.05	-.88	Gender
Self-efficacy	.04	.38	5.72**	.04	.37	5.79**	Self-efficacy
Behavioral engagement	.03	.17	2.35*	.02	.16	2.32*	Academic Engagement
Behavioral disengagement	.01	.04	.57				
Intrinsic value for learning	.00	.02	.26	.00	.03	.41	Intrinsic value for learning
Goal-oriented self-regulation	.03	.10	1.80	.03	.10	1.79	Goal-oriented self-regulation
Parents' pro-educational attitudes	.02	.16	2.75**	.02	.17	2.94**	Parents' pro-educational attitudes
Relationship with adults	.00	.00	.20				
Opportunity for meaningful participation	.00	-.08	-1.13	.02	.03	.46	School Climate
Perceived school safety	.00	.09	1.42				
School connectedness	.00	.00	.01				
Peers' academic engagement	.00	-.02	-.26	.00	-.04	-.55	Peers' academic orientation
Peer support	-.01	-.03	-.69				
Neighborhood structure	.00	-.03	-.60	-.01	-.05	-.84	Neighborhood structure
Parent-teacher/ parent-school communication	.01	.09	1.45	.01	.08	1.23	Parent-teacher/ parent-school communication
R^2		.35			.33		R^2

*$p \leq .05$; **$p \leq .01$

Research question 4. (a) Does school climate moderate the association between SES and academic engagement? (b) Does school climate moderate the association between SES and academic achievement?

One hierarchical linear regression analysis was used to determine if school climate was moderating relations between SES and academic engagement or academic achievement. An interaction term (product term) was created between school climate and SES and entered in step two of the hierarchical regression analysis to observe a change in the variance explained. Only in cases when a significant change between models was found were the residuals and standard deviations graphed, so that the strength and direction of the interaction could be observed.

First, school climate was examined as a moderator of the relation between SES and academic engagement. The covariates grade, gender, and ethnicity as well as the explanatory variables SES and school climate were entered in the first step of the regression analysis. In the second step, the interaction term (SES * school climate) was entered. There was no significant change in the model, $\Delta R^2 = .002$, $F(1, 299) = .65$, $p < .421$. Thus, overall school climate was not a significant moderator.

The four individual school climate variables, (1) relationships with adults at school, (2) opportunities for meaningful participation at school, (3) perceived school safety, and (4) school connectedness, were then examined individually for moderation effects by creating interaction terms for each of the variables and entering them into a hierarchical regression model in the same way as was done for overall school climate.

Results indicated that only opportunity for meaningful participation at school was a significant moderator of relations between SES and academic engagement. The interaction term explained a significant amount of variance in academic engagement, $\Delta R^2 = .012$, $F(1, 289) = 4.53$, $p < .034$. A simple slope analysis graphing opportunities for meaningful participation at

school one SD above the mean and one SD below the mean shows that academic engagement generally varies by SES, but when students perceived to be offered more opportunities for participation at school they also had even higher academic engagement scores (see Figure 1).

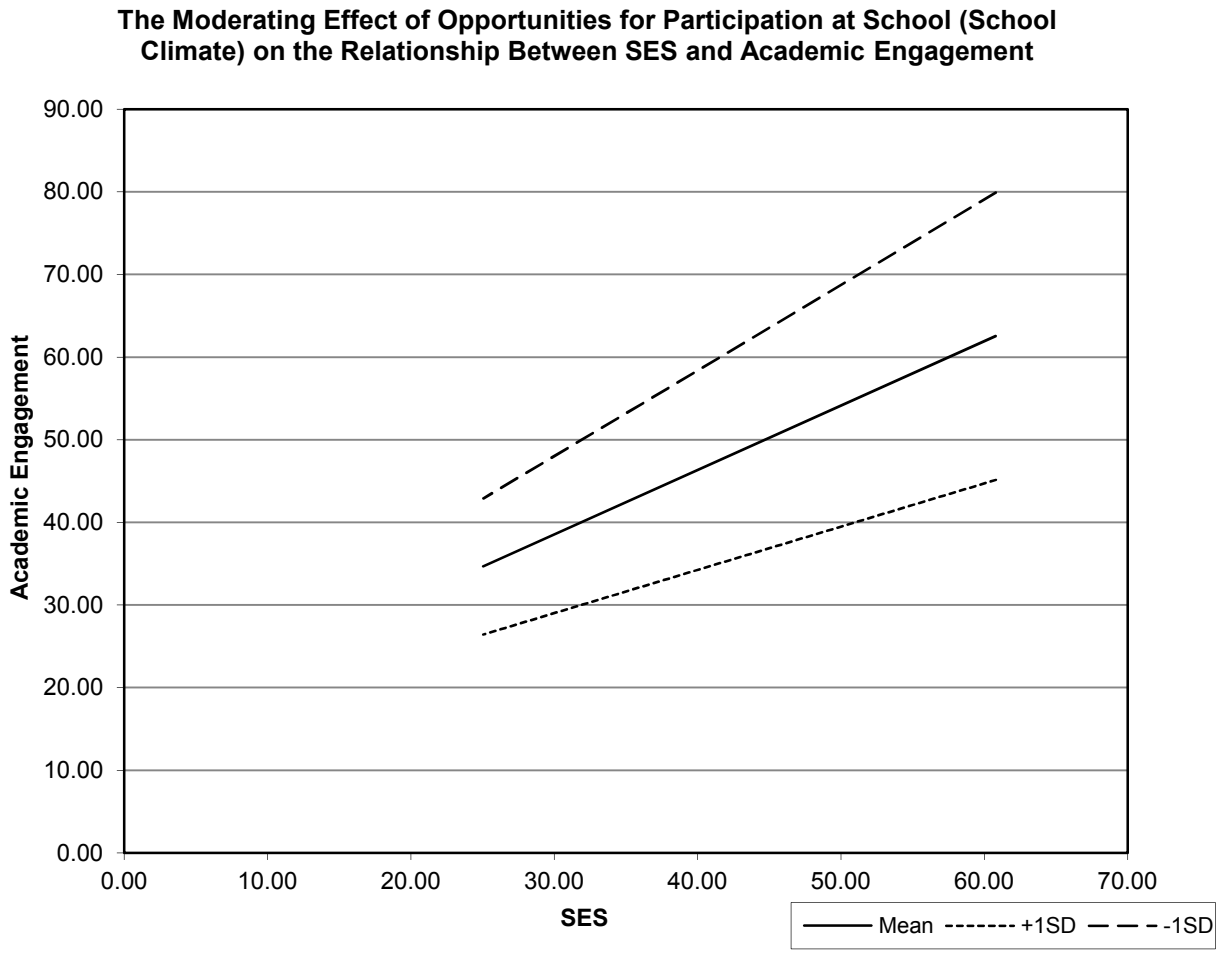

Figure 1: Simple Slope of SES predicting Academic Engagement with Opportunities for Participation at School as Moderator 1 SD above the mean, at the mean, and 1 SD below the mean.

Another hierarchical linear regression analysis was used to determine if school climate was moderating relations between SES and academic achievement. The covariates grade, gender, and ethnicity as well as the predictors SES and school climate were entered in the first step of the regression analysis. In the second step, the interaction term (SES * school climate) was entered. There was no significant change in the model, $\Delta R^2 = .002$, $F(1, 281) = .712, p < .399$. Thus overall school climate was not a significant moderator in predicting academic achievement.

The four individual school climate variables were also examined for interaction effects in regards to academic achievement as the outcome variable. Results indicated that (1) relationship with adults at school, $\Delta R^2 = .00$, $F(1, 281) = .01, p < .931$, (2) opportunity for meaningful participation at school, $\Delta R^2 = .002, F(1, 281) = .65, p < .421$ (3) perceived school safety, $\Delta R^2 = .003$,$F(1, 281) = .83, p < .365$, and (4) school connectedness, $\Delta R^2 = .002$, $F(1, 281) = .659, p < .418$, were not significant moderators for the relationship between SES and students' academic achievement.

Research question 5. (a) Does school climate moderate the association between neighborhood structure and academic engagement? (b) Does school climate moderate the association between neighborhood structure and academic achievement?

To answer research question 6, similar analyses were run as in research question 5. Another hierarchical linear regression analysis was used to determine if school climate was moderating relations between neighborhood structure and academic engagement. The covariates grade, gender, and ethnicity, as well as the predictors neighborhood structure and school climate were entered in the first step of the regression analysis. In the second step, the new interaction term (neighborhood structure * school climate) was entered. There was no significant change in the model, $\Delta R^2 = .00$, $F(1, 286) = .041, p < .839$. Thus overall school climate was not a significant moderator between neighborhood resources and academic engagement.

The four school climate variables (1) relationship with adults at school, (2) opportunity for meaningful participation at school, (3) perceived school safety, (4) school connectedness were also examined individually for moderation effects by creating interaction terms for each of the variables and entering the terms into hierarchical regression models in the same way as was done for overall school climate.

Results indicated that (1) relationship with adults at school, $\Delta R^2 = .006$, $F(1, 286) = .006$, $p < .153$, (2) opportunity for meaningful participation at school, $\Delta R^2 = .000$, $F(1, 286) = .01$, $p < .939$, (3) perceived school safety, $\Delta R^2 = .000$,$F(1, 286) = .05$, $p < .816$, and (4) school connectedness, $\Delta R^2 = .002$,$F(1, 286) = .71$, $p < .400$, were not significant moderators for the relationship between neighborhood resources and academic engagement.

Another hierarchical linear regression analysis was used to determine if overall school climate was moderating relations between neighborhood status and academic achievement. The covariates grade, gender, and ethnicity as well as the predictors neighborhood resources and school climate were entered in the first step of the regression analysis. In the second step, the interaction term (neighborhood resources * school climate) was entered. There was no significant change in the model, $\Delta R^2 = .00$, $F(1, 278) = .005$, $p < .945$. Thus, overall school climate was not a significant moderator.

The four individual school climate variables were also examined for interaction effect in regards to academic achievement as the outcome variable. Results indicated that (1) relationship with adults at school, $\Delta R^2 = .00$, $F(1, 278) = .004$, $p < .949$, (2) opportunity for meaningful participation at school, $\Delta R^2 = .001$, $F(1, 278) = .24$, $p < .629$ (3) perceived school safety, $\Delta R^2 = .002$,$F(1, 278) = .54$, $p < .462$, and (4) school connectedness, $\Delta R^2 = .001$, $F(1, 278) = .16$, $p < .693$, were not significant moderators for the relationship between neighborhood status and student academic achievement.

CHAPTER 5 - DISCUSSION

The overarching goal of this study was to identify a set of predictors of academic achievement, sampling from specific intrapersonal, microsystem, and macrosystem domains, and to explore which emerged as significant predictors while also understanding their relative importance to one another. Another purpose of this study was to understand the potential moderating relationship of school climate variables between SES and academic achievement and between SES and academic engagement. Whether or not school climate variables moderate relations between neighborhood structure and academic engagement and between neighborhood structure and academic achievement was also examined.

Among the control variables, the most significant theme seems to be that males generally reported higher academic risk behaviors, while females reported higher engagement and consequently also better grades in school, as well as more positive relationships with peers and school personnel. There were differences between Latino and African-American students, in that Latino students reported higher grades, better overall academic behaviors, and lower risk behaviors than the African American students. According results, African American male students seemed to be at highest risk for academic failure. This is consistent with previous research (Lee, 2014; Henry, Knight, & Thornberry, 2012).

The first hypothesis was centered around how much of the variance in academic achievement was explained by intrapersonal variables and what was the relative contribution of each predictor towards academic achievement. Results showed that this combination of intrapersonal variables explained about a quarter of the variance. However, only self-efficacy and academic engagement were found to be statistically significant predictor variables. This is consistent with existing research, which found that self-efficacy beliefs have a strong impact on how students think, feel, and motivate themselves, and consequently react behaviorally in

regards to academic tasks (Chang & Chien, 2015; Bandura, Schunk & Zimmerman, 2012). Similarly, students' academic engagement is related to the level of preparedness to learn, and also includes positive academic behaviors such as completing assignments, attending lectures and school regularly, as well as being overall attentive during class. Not surprisingly, students who reported a higher frequency of those positive academic behaviors also reported higher academic achievement.

In the second analysis/question, the goal was to better understand what was the overall contribution of microsystem variables to academic achievement, and which individual microsystem variables were statistically significant contributors to academic achievement. In combination , microsystem variables were a significant predictor of academic achievement, but they did not have predictive power above and beyond intrapersonal variables. Parents' pro-educational attitudes were found to be the only statistically significant variable. This underlines the role that parents' belief systems play in their children's lives. This seems to hold true even though older youths become more independent and seem to spend significantly more time outside from the home. It can be assumed that those parents who share belief systems with their child/children that communicate an understanding that school is an important step in life, and academics provide the basis for all further pursuits in life, are also parents who display behaviors that support their children in academics. It is important to note that findings held true across the relatively wide range of socioeconomic statuses included in this sample. Socioeconomic status was measured through the Hollingshead and included parents' income, the number of parents working, and children in living a given household. A review of the sample's demographics and preliminary analyses revealed that families in this sample were working professionals, but also single and low-income families with up to ten children in the home.

The mesosystem variable parent-teacher/ parent-school communication was not significant. In fact, correlations revealed that there was a small but significant inverse correlation between this variable and academic engagement. Previous research has pointed out that especially once youths enter high school, communication between teachers and parents, as well as school personnel and parents, dramatically declines and may only be established when problem behaviors in school arise or persist (Sui-Chu, Ho, & Willams, 1996). In support of this finding, interestingly, the correlation between parent-teacher/parent-school communication and parents pro-educational attitudes was negative. Thus, children who reported to have parents with negative educational belief systems were unexpectedly parents who communicated with the school more frequently. This could be because (a) these parents may more likely to speak to school personnel more often when children are failing in order to make adjustments, or (b) these parents may be engaged by school personnel more often because their children displayed problem behaviors at school or had difficulties in academics and the teachers are attempting to address these issues with the parents. However, the directionality and content/ quality of the parent-school/parent-teacher communications were not measured. In this study, only the frequency as reported by the students was measured. Perhaps the most accurate measure of parent-school/ parent-teacher communication would be a detailed record review of each student, which is an idea for future research.

Another interesting finding is that among the control variables (gender, ethnicity, and grade level), which were entered each time in the beginning of the analysis, grade level remained a significant predictor of academic achievement across all analyses. Preliminary analyses had revealed that 12th graders tended to receive higher grades as compared to the 9th grade students, while differences between other grade levels were not significant. Also, 12th graders tended to have a more positive perception of the overall school climate, especially school connectedness.

There are several things that could explain these differences by grade. One simple explanation is that students who are successful in school tend to stay in school, do not drop out, and therefore their academic achievement on average is higher in 12th grade because it only accounts for those students that did not end up dropping out. Another and more complicated issue may be that some students in 9th grade may be struggling with the adjustment from middle school to high school. Research shows that students entering into high school face more difficult coursework, a different organizational structure, new peers, more students in the classroom and school, and different expectations from teachers and administrators, all of which can add to higher levels of stress, which in return may temporarily lower overall academic achievement (Suldo & Shaunessey-Dedrick, 2013). These students may in addition also perceive overall school climate as less positive as compared to their older peers who have had sufficient time and opportunities to adjust because of these struggles (Johnson, Simon, & Mun, 2014).

The purpose of the remaining two research questions was to explore a potential moderating mechanism between SES and these academic variables. Only the school climate variable 'opportunity for meaningful participation at school' was found to moderate the relationship between SES and academic engagement. Specifically, it was found that when students perceived that they had control over some of the decisions that were made regarding activities and rules at school and that their input was valued and seemed to make a difference to others, it was found that those students generally reported higher academic engagement regardless of their SES. Also, students had the highest academic achievement when they perceived that they were presented with meaningful opportunities at school and their families had higher SES. Consistent with previous research, a greater impact on students was found when family and social support systems were overall more supportive (Henderson & Mapp, 2002). Given these findings, it is likely that schools can build a bridge between family and society, and

also provide children with important resources that families with multiple social, financial, and medical difficulties are often unable to offer. After-school programs, school organized outings, school organized clubs, volunteer opportunities offered at or through the school, and outreach programs connected to school are examples of such "bridges."

Limitations and Directions for Future Research

One limitation of this study was the use of a single high school. The sample for this study was drawn from a high school in an urban area within the Midwestern region of the U.S.A. rather than being selected randomly. Students were primarily African American and Hispanic, two minority groups that may differ in their response profiles significantly from Caucasian students. Findings from this study therefore, only apply to these two populations and should not be generalized. Future research could include multiple schools from urban and suburban contexts, and could even focus on comparing and contrasting these differing populations.

Another limitation was that students were approached by the researcher within their school, under the added supervision of their respective teachers. Although they handed their surveys directly to the researcher and not the teacher, and anonymity and confidentiality were guaranteed by the researcher to the students, many students may have felt suspicious of what might be done with their surveys. Another problem is that students gave their self-reported grades and were not required to report their current actual GPA. Although some research shows a high moderate correlation between actual and self-report grades (e.g., Somers et al., under review), it is still possible that students may have not been as accurate in their self-report. A follow-up study could perhaps make available students' accurate GPAs during self-report data collection, which they could then transfer to their surveys.

A final limitation was the format of the Goal-oriented self-regulation Scale (SOC-scale) that measured goal-orientation of students. The survey offered two possible response choices

between two statements that a student most identified with. All other surveys offered scaled response options. The wording and change in response options may have been confusing to students. The publishers of the SOC measure themselves noted that the instrument may prove more useful if scaled response options were provided in future research studies. At the current time, however, no such survey measuring the same construct was found.

Summary and Implications for Practice

Despite the possible limitations of this study, the current findings have made it evident that multiple factors across multiple ecological contexts contribute to academic achievement and academic engagement in high school students, and thus, that all levels of one's ecology should be tapped when trying to understand development of any particular construct, e.g., in this case, academic achievement. Overall, results showed that intrapersonal factors tend to have a higher impact on how students perform at school as compared to microsystem or macrosystem factors. These were parental pro-educational attitudes and opportunities for meaningful participation at school.

Thus, two primary themes may be the most important take-away messages from this study. First, in general, especially during the teenage years, many parents may underestimate the importance of consistent and involved parenting. The behaviors that parents model to their children, but also parental availability through emotional support and constructive feedback, are all important parenting components, as was demonstrated here with parents' pro-educational attitude being clearly related to higher academic achievement. It seems to clearly matter what and how much parents communicate to their children about academics and academic achievement values. Community, school, and outreach programs could focus to instill parents with confidence to speak to their children on a regular basis about the importance of education. Parents should feel empowered to do so, even when their children perhaps appear if they are

indifferent to their parents' advice. This research suggests that children may adapt what their parents communicate about their beliefs.

Another important finding in this research is that the only school climate variable showing a moderating relationship between SES and academic engagement was in regards to the opportunities provided by the school for meaningful participation. Previous studies have argued that school climate characteristics should adapt to the developmental needs of students (Jennings, 2003). This may mean that as students grow older, they are able to take more responsibility and tend to feel a higher sense of personal investment when they are asked and receive positive reinforcement to become an active member within the school and their educational contexts. It is, however, the schools that have to be enabled to present the youths with appropriate opportunities for engagement and personal growth. Such opportunities can, for example, include many low-budget solutions such as sports clubs, band, theater clubs, a student newspaper, including students in classroom management efforts, encouragement of community outreach, volunteer opportunities, and simple peer support programs such as a "lunch-buddy" system. Through these activities, students are more likely to feel like valued members of a community, they tend to feel accepted and appreciated, and they learn time management, leadership, and team-player skills. As Bernard (1995) so pointedly phrased, "when children are given responsibilities, the message is clearly communicated that they are worthy and capable of being contributing members (p.13)".

APPENDIX A - SURVEYS

Demographics

We would like you to tell us about YOURSELF:				
• How old are you?				
• Grade:	o 9th	o 10th	o 11th	o 12th
• Gender:		o Male	o Female	
• How many brothers and sisters do you have?				
• What is your race or ethnicity? (Mark all that apply)				
o White		o African American	o Hispanic/ Latino	
o Asian		o Native Hawaii/ Pacific Islander	o Other/ describe:	

My current Grade Point Average (GPA) is:			
Please circle a Grade and (+/-) below if applicable:			
In Math I mostly get:	In English, Language Arts, Reading I mostly get:	Science:	History or Social Studies:
+ A - + B - + C - D F	+ A - + B - + C - D F	+ A - + B - + C - D F	+ A - + B - + C - D F

Please use the following scale to tell us how often you engage in each of the behaviors below:	Never	Less than once a month	Once or few times a month	Once or few times per week	Several times a day
• I am tardy for class.	o	o	o	o	o
• I have an excused absence.	o	o	o	o	o
• I have an unexcused absence.	o	o	o	o	o
• I am suspended.	o	o	o	o	o

Tell us about your guardian/ parents:		
1. Do you live with your mother or another female guardian? (*if 'No', move to 2*)	o Yes	o No
• Does your mother/guardian work?	o Yes	o No
• She works as a:		
• Please give a description of her job:		
• If she works, how much does she work?	o Full-Time	o Part-Time
• Check the highest amount of education your mother/guardian completed?	o Some grade school	
	o Finished grade school	
	o Some high school	
	o Finished high school	
	o Some college	
	o Finished college	
	o Attended graduate school or professional school after college	
2. Do you live with your father or another male guardian?	o Yes	o No
• Does your father/ guardian work?	o Yes	o No
• He works as a:		
• Please give a description of his job:		
• If he works, how much does he work?	o Full-Time	o Part-Time
• Check the highest amount of education your father/guardian completed?	o Some grade school	
	o Finished grade school	
	o Some high school	
	o Finished high school	
	o Some college	
	o Finished college	
	o Attended graduate school or professional school after college	

Patterns of Adaptive Learning Scale

(Academic Self-Efficacy)

Tell us what you think and feel about schoolwork:	Not at all true	A little bit true	Somewhat true	Fairly true	Totally true
• I'm certain I can master the skills taught in my classes this year.	o	o	o	o	o
• I'm certain I can figure out how to do the most difficult class work.	o	o	o	o	o
• I can do almost all the work in class if I don't give up.	o	o	o	o	o
• Even if the work is hard, I can learn it.	o	o	o	o	o
• I can do even the hardest work in my classes if I try.	o	o	o	o	o

Engagement vs. Disaffection with Learning Scale

(Academic Engagement)

Tell us how you go about school and your schoolwork:	Not at all true	A little bit true	Mostly true	Very true
• I try hard to do well in school.	o	o	o	o
• When I'm in class my mind wanders.	o	o	o	o
• In school, I work as hard as I can.	o	o	o	o
• When I am in my classes, I think about other things.	o	o	o	o
• When I'm in class, I participate in class discussions.	o	o	o	o
• In my classes, I do just enough to get by.	o	o	o	o
• I pay attention in my classes.	o	o	o	o
• I don't try very hard at school.	o	o	o	o
• When I'm in class, I listen very carefully.	o	o	o	o
• When I'm in class I just act like I'm working.	o	o	o	o

Parent-Teacher Involvement Scale

(Parent-Teacher Contact Scale sub-scale & School Involvement sub-scale)

Tell us about your <u>parents</u> involvement in school and schoolwork:	Never	Once or twice a year	Almost every month	Almost every week	More than once per week
• My parent(s) has/have called a teacher of mine.	o	o	o	o	o
• My parent(s) has/have written a teacher of mine.	o	o	o	o	o
• My parent(s) has/have stopped to talk to a teacher of mine.	o	o	o	o	o
• My parent(s) has/have attended parent-teacher conferences	o	o	o	o	o
• My parent(s) has/have visited the school for a special event.	o	o	o	o	o
• My parent(s) has/have attended PTA meetings.	o	o	o	o	o
• My parent(s) has/have sent things to class.	o	o	o	o	o
• My parent(s) has/have volunteered at the school.	o	o	o	o	o

Adolescent Perceptions of Parental Pro-educational Attitudes and Behaviors Scale

(Attitudinal Scale)

Tell us what your <u>parents</u> think and have told you about school and schoolwork:	Not at all true	A little bit true	Somewhat true	Fairly true	Totally true
• My parent(s)/ guardian(s) think that you can work hard in a company to gain status, regardless of the level of education.	o	o	o	o	o
• My parent(s)/ guardian(s) feel that doing what makes me happy is more important than furthering my education .	o	o	o	o	o
• My parent(s)/ guardian(s) have never mentioned that they value education.	o	o	o	o	o
• My parent(s)/ guardian(s) believe that getting an education is NOT necessary to get a good job.	o	o	o	o	o
• My parent(s)/ guardian(s) believe that “street smarts” or common sense are more important to getting by in this world than textbook knowledge	o	o	o	o	o
• My parent(s)/ guardian(s) feel that the system in which I am being educated is flawed in many ways.	o	o	o	o	o
• My parents(s)/ guardian(s) think that the skills I am learning in school will NOT help me succeed in the real world.	o	o	o	o	o

Patterns of Adaptive Learning Scale and Learning Garden

(Friend Engagement and Friend Support for Learning)

Tell us about your <u>friends</u>:	Not at all true	A little bit true	Somewhat true	Fairly true	Totally true
My friends work hard at school.	o	o	o	o	o
My friends like school.	o	o	o	o	o
My friends think school is important.	o	o	o	o	o
My friends and I learn better when we study together.	o	o	o	o	o
Learning is more fun when my friends are around.	o	o	o	o	o
I can count on my friends to help me with my schoolwork.	o	o	o	o	o
If my friends need help with school stuff, they count on me.	o	o	o	o	o
My friends make me want to do better in school.	o	o	o	o	o
My friends are happy when I do well in school.	o	o	o	o	o
I am happy when my friends do well in school.	o	o	o	o	o

School Climate Perception Scale

Tell us how <u>you</u> think and feel about your <u>school</u>:	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
• At my school, there is an adult who really cares about me.	o	o	o	o	o
• At my school, there is an adult who tells me when I do a good job.	o	o	o	o	o
• At my school, there is an adult who notices when I am not here.	o	o	o	o	o
• At my school, there is an adult who always wants me to do my best.	o	o	o	o	o
• At my school, there is an adult who listens to me when I have something to say.	o	o	o	o	o
• At my school, there is an adult who believes I will be a success.	o	o	o	o	o
• At school, I do interesting activities. •	o	o	o	o	o
• At school, I help decide things like class activities or rules.	o	o	o	o	o
• At school, I do things that make a difference.	o	o	o	o	o
• I feel close to people at this school.	o	o	o	o	o
• I am happy to be at this school.	o	o	o	o	o
• I feel like I am a part of this school.	o	o	o	o	o
• The teachers at this school treat students fairly.	o	o	o	o	o
• I feel safe in my school.	o	o	o	o	o
For the last question please check level of safety:					
• How safe do you feel when you are at school?	Very Unsafe	Unsafe	Neither safe nor unsafe	Safe	Very safe

Patterns of Adaptive Learning Scale

(Neighborhood Structure)

Tell us about your Neighborhood:	Not at all true	A little bit true	Somewhat true	Fairly true	Totally true
• In my neighborhood, I have trouble finding safe places to hang out with my friends.	o	o	o	o	o
• After school, I find it difficult to find anything worthwhile to do in my neighborhood.	o	o	o	o	o
• On the weekends, I can find good and useful things to do in my neighborhood.	o	o	o	o	o
• After school, I can find many interesting and positive things to do in my neighborhood.	o	o	o	o	o
• In my neighborhood, there are places I can go to play outdoors and have fun.	o	o	o	o	o
• In my neighborhood, there are no places I can go that are attractive and clean.	o	o	o	o	o

Motivated Strategies for Learning Scale

(Intrinsic Values)

Tell us how <u>you</u> think and feel about your <u>school-work</u>:	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
• I prefer class work that is challenging so I can learn new things.	o	o	o	o	o
• It is important for me to learn what is being taught in my classes.	o	o	o	o	o
• For the most part, I like what I am learning in my classes.	o	o	o	o	o
• For the most part, I think I will be able to use what I learn at school in my future career.	o	o	o	o	o
• I often choose paper topics I will learn something from even if they require more work.	o	o	o	o	o
• Even when I do poorly on a test I try to learn from my mistakes.	o	o	o	o	o
• I think that what I am learning in school is useful for me to know.	o	o	o	o	o
• For the most part, I think what I am learning in school is interesting.	o	o	o	o	o
• Understanding the content of my classes is important to me.	o	o	o	o	o

Selection-Optimization-Compensation Scale

You are almost done. These are the last 12 Questions. For this part we want you to read each statement carefully and choose the option that describes YOU THE BEST from each line:				
1	o	I concentrate all my energy on a few things	o	I divide my energy among many things.
2	o	I am always working on several goals at once.	o	I always focus on the most important goal at any given time.
3	o	When I think about what I want in life, I commit myself to one or two important goals	o	Even when I really consider what I want in life, I wait and see what happens instead of committing myself to just one or two particular goals.
4	o	When things don't go as well as they have gone in the past, I still try to keep all my goals	o	When things don't go as well as they have gone in the past, I choose one or two important goals.
5	o	When I can't do something important the way I did before, I look for a new goal.	o	When I can't do something important the way I did before, I distribute my time and energy among many other things.
6	o	When I can't do something as well as I used to, I think about my priorities and what exactly is important to me.	o	When I can't do something as well as I used to, I wait and see what happens.
7	o	I keep working on what I have planned until I succeed.	o	When I do not succeed right away at what I want to do, I don't try other possibilities for very long.
8	o	I prefer to wait a while and see if things work out by themselves.	o	I make every effort to achieve a given goal.
9	o	Even when something matters to me, I still have a hard time devoting myself fully and completely to it.	o	If something matters to me, I devote myself fully and completely to it.
10	o	When things don't go as well as they used to, I keep trying other ways until I can achieve the same result I used to.	o	When things don't go as well as they used to, I accept it.
11	o	When something in my life isn't working as well as it used to, I decide what to do about it myself, without involving other people.	o	When something in my life isn't working as well as it used to, I ask others for advice and help.
12	o	When it becomes harder for me to get the same results, I keep trying harder until I can do it as well as before.	o	When it becomes harder for me to get the same results, it's time to let go of that expectation.

APPENDIX B - PARENTAL INFORMATION SHEET

Parental Permission/Research Informed Consent

Title of Study: *Applying an Ecological Model to Predict Adolescent Academic Achievement*

Purpose:
You are being asked to allow your child to participate in a research study at their school that is being conducted by Claudia Anagurthi out of the College of Education/ Behavioral Foundations at Wayne State University. The study aims to understand several factors that may contribute to academic achievement (good grades, good behavior in school, finishing High School, pursuing one's goals) in High School. Your child has been selected because he/she is in High School, is at a suitable age to complete questions about self, and the direct opinions of all students matter to us.

Study Procedures:
If you decide to allow your child to take part in the study, your child will be asked to complete a survey comprised of 95 multiple choice questions that give us information about his/her attitudes toward school, your family's attitudes toward education, how your child feels about the school they are currently attending, resources made available to children in their school and community, and your child's connection to teachers. We are also observing motivation, self-efficacy, and your child's current grade(s) as reported by your child. We will not collect any identifying information. That means the researcher will not be able to understand who filled out the survey. Therefore, student's answers are considered anonymous. Your child is free to skip any questions, or drop out of the study at ANY point of time without punishment.
If you and your child decide that he/she can participate, your child should be able to fill in the survey in about 15 min, but we will take no more than 45 minutes of your child's time. This will be a one-time event, no follow-up sessions are required. Copies of the study materials can be requested from the researcher personally, but a copy of the original questionnaires will also be available at the principal's office.

Benefits:
The benefits to your child for taking part in this study are a small candy incentive and a $250 donation to the school's media center/ library. Additionally, information from this study may benefit other people now or in the future, by providing the researcher with valuable information, that can bring changes in how schools operate, dictate how resources in communities are spent, and how school and community interventions are implemented. If desired, the researcher may speak at a PTA meeting about the results of the study.

Risks:
There are no known risks at this time to your child for participation in this study.

Costs
There are absolutely no costs to you or your child to participate in this study. The researcher and principal of this school have also put considerable thought into how to minimize loss of academic time for the student.

Compensation:
For taking part in this research study, your child will receive a piece of candy of his/ her liking.

Confidentiality:
All information collected about your child during the course of this study will be kept confidential to the extent permitted by law. All information collected about your child during the course of this study will be kept without any identifiers.

Voluntary Participation /Withdrawal:
Your child's participation in this study is voluntary. You may decide that your child can take part in this study and then change your mind. You are free to withdraw your child at any time. Your decision about enrolling your child in the study will not change any present or future relationships with Wayne State University or its affiliates, your child's school, your child's teacher, your child's grades or other services you or your child are entitled to receive.

Questions:
If you have any questions about this study now or in the future, you may contact Claudia Anagurthi or one of her research team members at the following phone number (248) 933 89 19. If you have questions or concerns about your rights as a research participant, the Chair of the Human Investigation Committee can be contacted at (313) 577-1638. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call (313) 577-1658 to ask questions or voice concerns or complaints.

Participation
If you do not contact the principal investigator (Claudia Anagurthi) within a 2-week period, to state that you do not give permission for your child to be in this research, your child will be enrolled in the study.
You may contact Claudia Anagurthi to ask questions at any time at:
e-mail: as5648@wayne.edu
phone & text: (248) 933 8919
mail: 522 Bloomer Ridge Dr, Rochester, MI-48307.

If you do not wish to have your child participate in the study, you may fill out the form and return it to your child's teacher.

I do not allow my child _____to participate in this research study.

Name

_____
Printed Name of Parent

_____ _____
Signature of Parent Date

APPENDIX C - ADOLESCENT ASSENT FORM

Title: ***Applying an Ecological Model to Predict Adolescent Academic Achievement***

Study Investigator: Claudia Anagurthi

Why am I here?
This is a research study. Only people who choose to take part are included in research studies. You are being asked to take part in this study because you are currently going to high school and are in a great age (above 13 years) to share important opinions with others. However you do not have to take part in this study and may drop out at any time.

Why are they doing this study?
This study is being done to find out what helps students to do well in school, and what helps them to find good jobs after they finish High School, so they can be successful in life.

What will happen to me?
We have already sent an information sheet to your parent(s)/ caregiver and your mom/ dad/ legal guardian have agreed for you to take part in this study. We will give you a short questionnaire with multiple choice questions, and ask you to answer the question to the best of your ability. This should take you about 15-45 minutes depending on how fast you work. You will receive candy/ snack and your school will receive a small donation for their media center/ library.

How long will I be in the study?
You will be in the study for 15 to 45 minutes. This study takes place in one session only, and no follow up sessions are necessary.

Will the study help me?
You may benefit from being in this study because you may win a gift card, and you receive a small candy/ snack right after you finish filling in the survey. Your school will receive a donation to their media-center, which will provide you with more resources in the future for you studies. Additionally, information gained from this study may help other people in the future because we are trying to find out how parents, schools, and communities can provide better services to students so they get better grades and become successful in life.

Will the study hurt?
There a no risks associated with the study.

Will I get paid to be in the study?
No you are not “paid”. But for taking part in this research study, you will receive a candy bar/ snack.

Do my parents or guardians know about this?
Yes, we have informed your parent(s)/ guardian about this study, and they had a chance to withdraw you from the study. This study was explained to your parent(s)/guardian and they said that you could be in it. However, it is up to you if you want to participate.

What about confidentiality?
This study is completely confidential. We do not ask your name, birth date, or any other information that tells us who filled in the questionnaire. We ask that you only fill in what we ask you, and do not add any personal information about you, to ensure continued privacy to you and your family.

What if I have any questions?
For questions about the study please call Claudia Anagurthi at (248) 933 8919. If you have questions or concerns about your rights as a research participant, the Chair of the Institutional Review Board can be contacted at (313) 577-1628. If you are unable to contact the research staff, or if you want to talk to someone other than the research staff, you may also call the Wayne State Research Subject Advocate at (313) 577-1628 to discuss problems, obtain information, or offer input.

Do I have to be in the study?
You don't have to be in this study if you don't want to or you can stop being in the study at any time. No one will be angry if you decide to stop being in the study.

Do you agree to be in the study?
Your check mark below means that you have read the above information about the study and have had a chance to ask questions to help you understand what you will do in this study. Your check mark also means that you have been told that you can change your mind later and withdraw if you want to. By placing a check mark on this assent form you are not giving up any of your legal rights. You will be given a copy of this form.

◯ Yes. I understand the above information and agree to take part in this study.

◯ No, thank you. I do not want to take part in this study.

>If "YES" please flip to the next page and fill in the questions to the best of your ability. We would like you to be honest, and fill in all of the pages. However if you are uncomfortable with a question, or simply do not know the answer, skip and fill out the rest.

>If "NO", you can simply stay in your seat and keep yourself busy with some other quiet activity.

Thank You, we appreciate your help & value your input. ☺

APPENDIX D - ORAL ASSENT SCRIPT

Good Morning/Afternoon, my name is Claudia Anagurthi and I am a doctoral student and research assistant at Wayne State University.

Today I am here to talk to you about a research project that I am working on. I am going to be collecting some information about your feelings, your peers, and your impressions of your school. I would also like to know how you perform academically. Answering all of the questions on the surveys should take approximately 15-20 minutes.

No one at school, including your teacher, will be able to see your answers to the questions. We will not ask for your name, and while we would like you to answer as honestly as you can, we do not want you to add any additional information about yourself.

A form was mailed to your home that explained this to your parents as well. Your parents have had the option to have you NOT participate. You do not have to complete the surveys if you do not want to. You can stop the survey at any time. Your completion of the survey will not affect the way are treated by any teacher, school staff, or myself.

Please remember this is not a test and it will not be graded. It does not have an impact on your grades or school work whatsoever. It is just important that you are very honest. Please do not put your name on any of the surveys. Please raise your hand if you need help at any time. When you are finished please hand over your survey packet to me. If you are not participating, you can complete course work as regularly scheduled.

It is very important that you do not discuss the survey or your answers with other students or staff. If you have any questions, please tell an adult at school.

Thank you very much

APPENDIX E - WSU INSTITUTIONAL REVIEW BOARD APPROVAL

WAYNE STATE UNIVERSITY

IRB Administration Office
87 East Canfield, Second Floor
Detroit, Michigan 48201
Phone: (313) 577-1628
FAX: (313) 993-7122
http://irb.wayne.edu

CONCURRENCE OF EXEMPTION

To: Claudia Anagurthi
College of Education

From: Dr. Deborah Ellis
Chairperson, Behavioral Institutional Review Board (B3)

Date: May 05, 2016

RE: IRB #: 034416B3X

Protocol Title: Applying an Ecological Model to Predict Adolescent Academic Achievement

Sponsor:

Protocol #: 1603014759

The above-referenced protocol has been reviewed and found to qualify for Wayne State University Institutional Review Board Exempt Category 7 according to the Flexible Review and Oversight of Research Not Covered by Federalwide Assurance policy.

- Revised Social/Behavioral/Education Exempt Protocol Summary Form (received in the IRB office 4/14/2016)
- Research Protocol (received in the IRB office 3/14/2016)
- Medical Records not being accessed therefore HIPAA does not apply.
- Parental Permission/Research Informed Consent (revision dated 2/7/2016)
- Assent Information Sheet (revision dated 4/14/2016)
- Oral Assent Script
- Data Collection Tool: Survey

This proposal has not been evaluated for scientific merit, except to weigh the risk to the human subjects in relation to the potential benefits.

- Exempt protocols do not require annual review by the IRB.
- All changes or amendments to the above-referenced protocol require review and approval by the IRB **BEFORE** implementation.
- Adverse Reactions/Unexpected Events (AR/UE) must be submitted on the appropriate form within the timeframe specified in the IRB Administration Office Policy (http://irb.wayne.edu/policies-human-research.php).

NOTE: Forms should be downloaded from the IRB Administration Office website http://irb.wayne.edu at each use.

Notify the IRB of any changes to the funding status of the above-referenced protocol.

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ABSTRACT

APPLYING AN ECOLOGICAL MODEL TO PREDICT ADOLESCENT ACADEMIC ACHIEVEMENT

by

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May 2017

Advisor: Dr. Cheryl Leigh Somers

Major: School and Community Psychology

Degree: Doctor of Philosophy

The purpose of this study was to examine the relationships between multiple intrapersonal, microsystem, and macrosystem factors. The predictor variable was academic achievement. The theoretical model used was Bronfenbrenner Ecological Systems Theory and Bandura's Social Learning Theory.

Participants in this study were ninth to twelfth grade high school students from a charter school that catered to students from urban and suburban backgrounds (N = 312). Students were from various socioeconomic backgrounds but primarily of African American and Latino descent. The students were asked to complete several surveys assessing their demographics and the variables grouped by their ecological contexts as follows: Intrapersonal Variables (1) Academic Self-efficacy; (2) Academic Engagement; (3) Intrinsic Value for Learning; (4) Goal-oriented self-regulation; Microsystem Variables: (1) Parents Pro-Educational Attitudes, (2) Peers Academic Orientation, (3) School Climate, (4) Neighborhood Structure and the Mesosystem Variable (1) Parent-teacher/ parent-school communication. Academic Risk Behaviors were also assessed.

Results of the current study suggest that the intrapersonal factors self-efficacy and academic engagement are most predictive of academic achievement, while the microsystem variable of parental pro-educational attitudes towards education also significantly predicted academic achievement. A moderation analysis revealed that when schools provide meaningful opportunities for participation for students, students tended to generally have higher academic engagement, while living in a family with higher SES boosted that relationship. All analyses were controlled for differences in SES, ethnicity, and grade. One unexpected finding was that the differences among variables existed by grade. Meaning and significance of results were discussed.

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