

THE EFFECTS OF RISK AND PROMOTIVE FACTORS ON  
ACADEMIC ACHIEVEMENT AMONG ADOLESCENTS

by

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## Abstract

We utilized a systems approach to a risk and resilience model to examine individual and environmental factors of academic achievement. We investigated the effects of potential protective factors – self-regulated learning, growth mindset, and social support – on the relationship between risk and academic achievement. We predicted that social support, self-regulated learning, and growth mindset would each have a protective effect on the relationship between risk and achievement. We also investigated whether these three key factors would have an additive protective-stabilizing effect on the relationship between risk and academic achievement. Participants completed an online survey. The sample included 73 high school freshmen and sophomores, ages 14-16. Although we found no moderating effects on the relationship between risk and GPA, we identified teacher social support and self-regulated learning as significant promotive factors. The findings are consistent with a compensatory model of resilience. Results are discussed in light of achievement disparities between high and low SES students.

*Keywords:* risk, resilience, social support, self-regulated learning, growth mindset, academic achievement, adolescence

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### The Effects of Risk and Promotive Factors on Academic Achievement among Adolescents

Pervasive ethnic and racial disparities in education follow a pattern in which African Americans and Latinos tend to underperform academically, relative to Whites and Asian Americans (Winerman, 2011). These educational inequalities mirror ethnic and racial disparities in socioeconomic status (SES). Group differences are consistently reflected in achievement test scores, such as reading and mathematics (Winerman, 2011). We utilize a systems approach to consider how both individual factors, such as growth mindset and self-regulated learning, and environmental factors, such as social support, are related to students' academic achievement in the face of risk. The current study will address the issue of educational disparities and contribute to risk and resilience literature by investigating how these individual and environmental factors are related to academic achievement.

#### **Risk**

Risk is defined as psychosocial adversity, or exposure to negative life events that pose a threat to the development of competent behavioral and mental health outcomes (Arrington & Wilson, 2000). Specific examples of risk factors for children and adolescents include single parent households, low engagement in school and community, and stressful home environments (Swanson, Valiente, & Lemery-Chalfant, 2012; Taylor, 2010). Stress encountered from negative life events can be used to estimate risk, as stress can cause maladaptive development (Arrington & Wilson, 2000). Youths who report more stressful life events also report more negative outcomes (Arrington & Wilson, 2000; Dornbusch, Ritter, & Steinberg, 1991). Risk factors are related to such negative

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outcomes as behavioral problems, parent-adolescent conflict, psychological distress, and academic problems (Gutman, McLoyd, & Tokoyama, 2005; Kim & Brody, 2005; Loukas, Prelow, Suzzo, & Allua, 2008; Mistry et al., 2002). Socioeconomic status (SES), which includes education level and income, is a broad gauge for risk level (Arrington & Wilson, 2000). Adverse economic conditions (e.g., low family income) may negatively affect family environments and cause the psychological distress associated with risk (Taylor, 2010). Adolescents living in poverty are also at risk due to normative stressors associated with living in low-income and single parent households (Arrington & Wilson, 2000). Some normative stressors that may affect low SES adolescents on a daily basis could include school pressures, experiences of discrimination, and risky sexual relationships (Arrington & Wilson, 2000).

Risk is negatively related to academic achievement and, similarly, SES is positively related to academic achievement (Gutman, Sameroff, & Eccles, 2002; Shumow, Vandell, & Posner, 1999; Stull, 2013; Swanson et al., 2012; Taylor, 2010). Shumow et al. (1999) found that academic performance was negatively associated with neighborhood risk even when controlling for familial risk (e.g., parental involvement, emotional support) among fifth graders. Having low resources within one's neighborhood could influence a child's access to learning opportunities and academic growth, whereas family structure could also influence one's success in school. Risk factors threaten the development of competent academic behaviors and mindsets, leading to lower academic achievement (Arrington & Wilson, 2000).

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### **Resilience**

Despite exposure to risk associated with low SES and exposure to stress, some individuals avoid or overcome negative outcomes through the process of resilience (Fergus & Zimmerman, 2005). Resilience is both a process and an outcome of avoiding or overcoming problems of vulnerability through assets or resources when risk factors are present (Fergus & Zimmerman, 2005). The presence of risk is necessary for resilience, as the resilience process works in opposition to risk factors to affect outcomes.

Resilience is not a static individual trait, and there are not overarching protective factors for all types of risk and negative outcomes. Researchers suggest that resilience may be content- and context-specific and that different risks may require different types of resilience (Fergus & Zimmerman, 2005; Knowles, 1977). For example, in terms of drug and alcohol abuse as a risk outcome, family structure serves as either a risk factor or a resilience factor. Adolescents living with only a father tend to have less drug use compared to those living with only a mother, especially if the adolescent-mother relationship is distressed (Farrell & White, 1998). Having a father may serve as a resilience factor within several variations of family structures, as it moderates the relationship between peer pressure and drug use. While self-efficacy and self-esteem are commonly considered in resilience research, more research is needed to investigate resilience in an academic context (Arrington & Wilson, 2000).

A variety of approaches to resilience models exist, because there are differences in which an asset or resource may affect outcomes across risk levels in a population.

Three different models to examine relationships between risk and risk outcomes are compensatory, challenging, and protective approaches. In a compensatory approach, the

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promotive factor has a direct effect on an outcome, independent from risk (Fergus & Zimmerman, 2005). For example, risk may influence an adolescent's violent behavior, while adult monitoring could compensate for risk factors. However, in this approach, the compensatory factor may not moderate the relationship between the risk factor and the risk outcome. In the challenging approach, the relationship between risk and the outcome is curvilinear. In this case, both risk and promotive factors studied are the same variables, and it is expected that moderate to low levels of exposure to the variable (risk factor) may lead to the least negative outcomes by preparing the individual with coping skills (Fergus & Zimmerman, 2005). The challenging approach differs from the protective and compensatory approaches, which both assume a linear relationship between the variables. In the current study, we use a protective approach to assess risk associated with low SES by examining individual characteristics and experiences. Furthermore, we utilized a protective-stabilizing model of resilience in which the presence of individual and environmental protective factors is hypothesized to minimize or additively neutralize the relationship between SES and academic achievement. We examined three factors: social support, self-regulated learning, and growth mindset. Each of these factors has been shown to be positively correlated with academic achievement, yet more research is needed on how these factors might moderate the effects of risk on academic outcomes. We investigated a comprehensive analysis of resilience by including individual assets, growth mindset and self-regulated learning, as well as the environmental resource of social support.

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### **Social Support**

Social support can be defined as “an individual’s perceptions of general support or specific supportive behaviors (available or enacted upon) from people in their social network which enhances functioning and/or may buffer them from adverse outcomes” (Demaray & Malecki, 2002, p. 306). Researchers have analyzed children’s and adolescent’s social support network, and identify parents, teachers, and peers (close friends or classmates) as the members that make up their social support system (Demaray & Malecki, 2002; Wentzel, 1998).

Previous scholarship has identified social support as an important factor of academic achievement (Malecki, & Demaray, 2006; Wentzel & Asher, 1995). In general, students who perceive higher social support among their parents, teachers, and peers fare better academically than do their less supported counterparts (Levitt et al., 1994; Malecki & Demaray, 2006; Wentzel et al., 2010). The strength of the relationship between perceived social support and academic achievement varies depending on the type of relationship as well as the age of the child receiving the support (Rueger et al., 2010). However, regardless of age or type of relationship, students who perceive higher levels of support fare better academically than do their less supported counterparts (Levitt et al., 1994; Wentzel et al., 2010).

Researchers have identified social support as a protective factor in the relationship between risk and academic outcomes (Gutman et al., 2002; Gutman & Midgley, 2000). Supportive relationships with people in one’s social support network may be especially important for students of low SES backgrounds (Clark, 1983; Comer, 1980; Rutter, 1979). In a study of protective factors supporting the academic achievement of low SES

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African American students, Gutman and Midgley (2000) found that instead of focusing on either parental involvement or the school environment, the combination of both family and school factors may be most effective in supporting at risk youth. Additionally, Taylor (2010) showed that parental support was a crucial protective factor for at risk youth, and may alleviate some of the challenges facing low-income students. However, he found that these students are often those with the least access to parental social support. In a comparison study that considered characteristics of friendship networks and levels of high school engagement, at-risk students had more friends drop out, more working friends, and fewer school friends compared to students who were not at risk (Ellenbogen & Chamberland, 1997).

In the context of risk and resilience, social support serves as a protective factor. Yet, some researchers suggest that social support serves as a promotive factor. For example, Levitt et al. (1994) found that having supportive teachers is positively associated with standardized test scores and GPA, independent of the student's racial and socioeconomic background. This means that regardless of a student's race or income, supportive teachers may benefit all students equally. Although some researchers identify social support as a moderator on the effects of risk on academic achievement, more research is needed to address the inconsistencies in the literature as to whether social support serves as a protective or a promotive factor.

In the current study we address two gaps in the social support literature. First, we investigate social support in the context of risk and academic outcomes. Second, we address gaps by combining social support with individual factors to determine how together these factors might moderate the effects of risk on academic outcomes.

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Specifically, we examine self-regulated learning and growth mindset, which are individual factors that have been well documented in the literature to be associated with academic outcomes (Dweck, 2007; Pintrich, 1999). In researching social support in the context of risk, along with self-regulated learning and growth mindset, we hope to contribute to risk and resilience literature in an academic context.

### **Self-regulated Learning**

Self-regulated learning is defined as the systematic use of metacognitive processes, learning strategies, and motivational beliefs (Pintrich, 1999; Zimmerman, 1990; Zimmerman & Schunk, 2001). An example of using metacognitive processes is the implementation of providing feedback for oneself after completing a task in order to help adjust goals and strategies (Schunk and Zimmerman, 1998). Self-regulatory strategies are an important aspect of metacognitive processes (Pintrich, 1999; Zimmerman, 1990). Self-monitoring involves both self-regulation and metacognition and enables a student to gauge whether or not he or she understands a lecture or the material in a text comprehension task. Metacognitive processes and self-regulatory strategies are important in improving acquisition of material, enhancing comprehension of a subject, and nurturing the further use of the cognitive strategies (Elliot-Faust & Pressley, 1986; Pintrich, 1999). Learning strategies consist of cognitive learning strategies and task management strategies. Examples of cognitive learning strategies are rehearsal, elaboration, and organizational strategies (Pintrich, 1999). Task management strategies include strategies that promote effective use of time, picking a study environment that will not be distracting, and seeking help on classwork (Corno, 1986; Pintrich, 1999; Ryan & Pintrich, 1998; Zimmerman & Martinez-Pons, 1986; Zimmerman

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& Martinez-Pons, 1988). Another essential learning strategy entails planning activities (e.g., goal setting and self-instruction), which involve using cognitive processes to enhance attention, problem solving, response guidance, and motivation (Pintrich, 1999; Zimmerman, 1990).

Lastly, motivational beliefs entail self-efficacy, task value beliefs, and the role of goal orientation (Pintrich, 1999). Self-efficacy is the belief in one's abilities to complete a task and reach goals (Bandura, 1986; Schunk, 1985). Researchers found that self-efficacy is positively related to self-regulated learning (Pintrich, 1989; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991; Schunk & Ertmer, 2000). Furthermore, mastery goal orientation (e.g. setting goals to improve) is positively related to use of cognitive strategies, self-regulatory strategies, and academic performance (Barzegar, 2012; Pintrich, 1999). When a student finds the course work interesting, important, or useful, the student is more likely to use self-regulated learning due to belief in the value of the task (Pintrich et al., 1993). The use of metacognitive processes, self-regulatory strategies, learning strategies, and motivational beliefs are the foundational components of self-regulated learning, which support academic functioning.

Self-regulated learning is associated with academic achievement (Barzegar, 2012; Pintrich, 1999; Zimmerman & Martinez-Pons, 1988). When metacognitive processes, learning strategies, and motivational beliefs combine to form self-regulated learning, students show the highest levels of academic achievement (Zimmerman & Martinez-Pons, 1988). Students with high academic functioning (i.e., 99<sup>th</sup> percentile on mental ability tests) tend to use cognitive, metacognitive, and self-regulatory strategies significantly more often and more effectively compared to other students (Zimmerman &

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Martinez-Pons, 1986). However, researchers suggest these learning strategies alone are not enough to improve academic achievement (Zimmerman, 1990). Motivation is also a crucial element because students with higher levels of motivation tend to use learning strategies, such as rehearsal and setting goals, more often than students with lower levels of motivation (Bandura, 1989; Zimmerman & Martinez-Pons, 1986). Without motivational beliefs to implement the learning strategies, students may seldom use learning strategies in the first place while working on a task (Zimmerman, 2008). In a path analysis conducted by Barzegar (2012), participants in multiple studies were assessed on achievement goal orientations and motivational strategies for learning.

Metacognitive strategies and resource management skills, two elements of self-regulated learning, were positively correlated with academic achievement (Barzegar 2012). While self-regulated learning is associated with academic achievement, it has not been considered as a protective factor in the context of risk. We believe self-regulated learning may serve as a protective factor because it could be especially important for students from lower SES backgrounds to self-monitor their learning progress, effectively implement learning strategies, and cultivate motivation to learn. This research will contribute to the literature by examining the potential moderating effect of self-regulated learning on the relationship between SES and academic achievement.

### **Growth Mindset**

Mindsets are beliefs about the most basic qualities of the self and an individual's control over them; they have been shown to be important in academic success (Dweck, 2007). Dweck (2007) proposed that students tend to have one of two implicit theories of intelligence, or two different mindsets: an incremental view of intelligence (growth

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mindset) or an entity view of intelligence (fixed mindset). In an academic setting, students with a fixed mindset believe that their intelligence cannot change or be developed. In contrast, growth mindset is when students believe that their intelligence can improve.

Growth mindset is positively correlated with academic achievement (Dweck, 2007). In a study of students undergoing a junior high school transition, Henderson and Dweck (1990) found that students who endorsed a growth mindset earned significantly higher grades in the first year of junior high school. People with growth mindset have core beliefs that can set up beneficial patterns of response to challenges and setbacks (Dweck, 1999; Dweck & Leggett, 1988; Dweck & Sorich, 1999; Henderson & Dweck, 1990). Given this, we expect that with these adaptive responses to challenges and setbacks, growth mindset could serve as a protective factor against the negative effects of risk. This research may contribute to the literature by examining the potential moderating effect of growth mindset on the relationship between SES and academic achievement.

### **Current Study**

The first hypothesis is that risk will be associated with academic achievement; socioeconomic status will be positively correlated with academic achievement and negative life events will be negatively correlated with academic achievement. Second, social support will moderate the relationship between risk and academic achievement. Third, self-regulated learning will moderate the relationship between risk and academic achievement. Fourth, growth mindset will moderate the relationship between risk and academic achievement. The final hypothesis is consistent with the protective approach; we hypothesize that social support, self-regulated learning, and growth mindset will have

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an additive protective-stabilizing effect on the relationship between risk and academic achievement.

### **Methods**

#### **Participants**

The participants in our study were 73 high school students. There were 38 ninth graders and 30 tenth graders; one person did not disclose grade level, although their age was reported. The average age of the participants was 15.14 ( $SD = 0.71$ ). Most of our participants attended Walla Walla High School in Walla Walla ( $n = 62$ ), a Washington State public high school with a racially and ethnically diverse student body. Participants were also from Eisenhower High School ( $n = 1$ ), A.C. Davis ( $n = 2$ ), and East Valley High School in Yakima, Washington ( $n = 1$ ). We recruited participants from Lick-Wilmerding High School ( $n = 1$ ) and Del Oro High School ( $n = 1$ ) in California, as well as Seattle Preparatory High School ( $n = 1$ ). We had 36 Hispanic participants, 24 White participants, five bi-racial participants, one Asian participant, one Native American participant, and two participants who chose not to identify their race. Participants included 28 boys, 39 girls, and two students that chose not to identify their sex. Based on participants' responses, most students were from low SES backgrounds, with 27 participants who reported their father having some or no high school education. Additionally, seven had GEDs, 15 had High School Diplomas, 12 had Associate Degrees, five had Bachelor's Degrees, and three had Graduate Degrees.

#### **Procedure**

After contacting the school and teachers about their students taking our survey, we provided potential participants and parents with a cover letter and informed consent

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form. Parents received the letter about the study as well as the informed consent form, in hard copy or online, and were given the opportunity to grant consent for their child to participate.

We collected participants' informed consent forms (signed on paper or electronically by their parents) in person or through Qualtrics, a survey database. All participants then signed an informed assent form on Qualtrics, which informed participants that there were no right or wrong answers, all answers were confidential, and they had the option to stop participating in the study at any point.

After collecting both the consent and assent forms, participants completed the survey online. Participants completed the survey in approximately 7-15 minutes, according to Qualtrics output. Participants were given a Debriefing Statement and researchers were available to answer any questions through email. Participants' confidentiality was assured by identifying each participant by number codes rather than by name. Only the researchers had access to the data through a secure log-in on Qualtrics.

### **Measures**

**Academic achievement.** To assess academic achievement, participants reported their unweighted cumulative GPA. We also asked participants to report their most common letter grade using the responses (1) A's, (2) A's and B's, (3) B's, (4) B's and C's, (5) C's, (6) C's and D's, and (7) D's and below. Three students did not report their unweighted cumulative GPA's, so we estimated their GPA using the information about their most common letter grade (e.g., if a student answered (1) A's, their estimated GPA was a 4.00, if a student answered (2) A's and B's, their estimated GPA was a 3.50, etc.).

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All other students' self-reported GPA was used as a primary measure for academic achievement.

**Negative life events.** To assess risk associated with exposure to stress, we used a modified version of the Life Events for Adolescents (LEQ-A) measure (Masten et al., 1988). Participants answered "Yes" or "No" for each of the 10 questions. One example is: "My brother or sister became seriously ill or was injured during this past year." We computed the score as a total out of 10.

**Socioeconomic status.** We used father's education level as a proxy for socioeconomic status. Response options included (1) Some or no high school, (2) GED, (3) High School Diploma, (4) Associate Degree (Community College), (5) Bachelor's Degree, (6) Graduate Degree, (7) PhD or Doctorate Level Degree.

**Social support.** To assess social support, we used a modified version of the Child and Adolescent Social Support Scale (CASSS; Malecki & Demaray, 2000). The adapted scale included three subscales (parents, friends, and teachers) with eight questions each. Participants rated these 24 questions regarding how often the statement occurs with their parents, friends, or teacher from *Never* to *Always* on a 6-point Likert scale. An example item is: "My teachers care about me." The composite social support scale was reliable ( $\alpha = .928$ ), the parent support subscale was reliable ( $\alpha = .914$ ), the friend support subscale was reliable ( $\alpha = .916$ ), and the teacher support subscale was reliable ( $\alpha = .907$ ).

**Self-regulated learning.** In order to evaluate self-regulated learning levels of the participants we used a modified version of the Motivated Strategies for Learning Questionnaire (Pintrich, Garcia, & McKeachie, 1991). Participants rated their answer

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from *Strongly Disagree* to *Strongly Agree* on a 5-point Likert scale for each of the 24 questions. An example item is: “When studying, I read my class notes and the course readings over and over again.” The scale was reliable ( $\alpha = .840$ ).

**Growth mindset.** To assess growth mindset, we used Implicit Theories of Intelligence Scale by Dweck (1999). Participant answered six questions about their beliefs about the malleability of intelligence using a 5-point Likert scale that ranged from *Strongly Disagree* to *Strongly Agree*. An example item is: “You can always greatly change how intelligent you are.” The scale was reliable ( $\alpha = .882$ ).

### Results

The data analysis was a four step process. In the first step, we used a bivariate correlational analysis to specifically examine the relations between risk, academic achievement, social support, self-regulated learning, and growth mindset. Second, we used linear regression analyses to examine the relations between academic achievement and the key factors individually, while controlling for SES. The third step consisted of testing for moderation effects by including an interaction variable in the linear regression equations, to test our second, third, and fourth hypotheses. Lastly, we used a linear regression analysis to test whether or not there was an additive protective-stabilizing effect of high levels of the three key factors on the relationship between risk and academic achievement.

### Risk

**Negative life events.** Participants reported a moderately low number of negative life events ( $M = 1.64$ ,  $SD = 1.79$ ) on a scale from 0 to 10. To test the relationship between negative life events and academic achievement, we used a correlational test.

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There was no correlation between negative life events and unweighted GPA (see Table 1).

**Socioeconomic status.** We used a correlational test to evaluate the relationship between father's education level and GPA. As predicted, there was a significant positive correlation between father's highest education level and GPA (see Table 1).

### **Social Support**

Students reported moderately high levels of social support ( $M = 4.10$ ,  $SD = 0.83$ ) on a scale of 1 to 6. To test the hypothesis that social support is positively correlated with academic achievement, we used a correlational test. Contrary to predictions, there was not a significant correlation between overall social support and GPA (see Table 1).

**Parental support.** Students reported having moderately high levels of parental social support ( $M = 4.02$ ,  $SD = 1.09$ ). In order to see whether there was a positive correlation between parental support and academic achievement, we used a correlational test. There was not a significant correlation between parent support and GPA (see Table 1).

**Friend support.** Students reported having moderate levels of friend social support ( $M = 3.98$ ,  $SD = 1.09$ ). In order to see whether there was a positive correlation between friend support and academic achievement, we used a correlational test. There was not a significant correlation between friend support and GPA (see Table 1).

**Teacher support.** Students reported having moderately high levels of teacher social support ( $M = 4.30$ ,  $SD = 1.09$ ). In order to see whether there was a positive correlation between teacher support and academic achievement, we used a correlational

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test. Consistent with our expectations, there was a significant positive correlation between teacher support and GPA (see Table 1).

### **Self-regulated Learning**

Students reported having moderate self-regulated learning scores ( $M = 3.45$ ,  $SD = 0.45$ ) on a scale of 1 to 5. We used a correlational test to examine the relationship between self-regulated learning and academic achievement. Consistent with past research, there was a positive correlation between self-regulated learning and GPA (see Table 1). In an additional correlation analysis we found that there was a significant positive correlation between self-regulated learning and social support (see Table 1).

### **Growth Mindset**

Students reported having moderately high growth mindset scores ( $M = 3.97$ ,  $SD = 0.74$ ) on a scale from 1 to 5. We used a correlational test to test our hypothesis that growth mindset is positively correlated with academic achievement. Inconsistent with past research, there was no significant correlation between growth mindset and GPA (see Table 1).

### **Tests of Potential Moderators**

Because there was a significant positive correlation between father's education level and GPA, the remaining analyses focusing on risk use SES as the measure of risk. To test our second, third, and fourth hypotheses regarding the moderating effects of social support, self-regulated learning, and growth mindset on the relationship between SES and academic achievement, we ran hierarchical linear regression analyses. All analyses use mean centered predictor variables.

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**Social support.** To test our second hypothesis regarding the potential moderating effect of social support, we used a hierarchical linear regression analysis. In the first step, we entered SES. In the second step, we entered SES and social support. Social support was not significantly related to GPA while controlling for SES (see Table 2). SES remained a significant predictor of GPA. In the third step, we added the SESxSocial support interaction term. Contrary to our second hypothesis, there was no moderating effect of social support on the relationship between SES and GPA; the interaction term was not a significant predictor (see Table 2). To further investigate social support as a moderator, we used hierarchical linear regression analyses for each of the social support subscales.

**Parent social support.** In the first step, we entered SES. In the second step, we entered SES and parental social support. Parent social support was not significantly related to GPA while controlling for SES (see Table 3). SES remained a significant predictor of GPA. In the third step, we added the SESxParent social support interaction term. There was no moderating effect of parent social support on the relationship between SES and GPA; the interaction term was not a significant predictor (see Table 3).

**Friend social support.** In the first step, we entered SES. In the second step, we entered SES and friend social support. Friend social support was not significantly related to GPA while controlling for SES (see Table 3). SES remained a significant predictor of GPA. In the third step, we added the SESxFriend social support interaction term. There was no moderating effect of friend social support on the relationship between SES and GPA; the interaction term was not a significant predictor (see Table 3).

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**Teacher social support.** In the first step, we entered SES. In the second step, we entered SES and teacher social support. SES remained a significant predictor of GPA. Additionally, teacher social support was significantly related to GPA while controlling for SES (see Table 3). In the third step, we added the SESxTeacher social support interaction term. There was no moderating effect of teacher social support on the relationship between SES and GPA; the interaction term was not a significant predictor (see Table 3).

**Self-regulated learning.** To test our third hypothesis regarding the potential moderating effect of self-regulated learning, we used a hierarchical linear regression analysis. In the first step, we entered SES. In the second step, we entered SES and self-regulated learning. Self-regulated learning was significantly positively related to GPA, while controlling for SES (See Table 2). SES also remained a significant predictor of GPA. Taken together, self-regulated learning and SES explained a significant proportion of variance in GPA,  $R^2 = .14$ ,  $F(1, 66) = 5.34$ ,  $p = .02$ . In the third step, we added the SESxSelf-regulated learning interaction term. Contrary to our third hypothesis, there was no moderating effect of self-regulated learning on the relationship between SES and GPA; the interaction term was not a significant predictor (See Table 2).

**Growth mindset.** To test our fourth hypothesis regarding the potential moderating effect of growth mindset, we used a hierarchical linear regression analysis. In the first step, we entered SES. In the second step, we entered SES and growth mindset. Growth mindset was not significantly related to GPA while controlling for SES (See Table 2). SES remained a significant predictor of GPA. In the third step, we added the SESxGrowth mindset interaction term. Contrary to our second hypothesis, there was

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no moderating effect of growth mindset on the relationship between SES and GPA; the interaction term was not a significant predictor (see Table 2).

**Additive effects.** To test our hypothesis that social support, self-regulated learning, and growth mindset would have an additive protective moderating effect on the relationship between SES and academic achievement, we first selected the top 34% of scores within each key factor (teacher social support, self-regulated learning, and growth mindset) and assigned each participant in that group the number 1 to identify them as highly rated on these key factors. We then assigned participants with a 0 for any key factor on which they were not highly rated. After tallying the number of factors in which each participant was in the top 34%, we created a combined variable that described which participants were highly rated on each social support, self-regulated learning, and growth mindset. These students were assigned a score of “1” on the dummy coded variable, High Protective Rating. We then used a hierarchical linear regression analysis with the dummy coded variable, High Protective Rating, and SES. The combined factor was not significantly related to GPA while controlling for SES (see Table 4). Lastly, we added the SESxHigh Protective Rating interaction term. Contrary to expectations, there was no significant interaction of the three key factors on the relationship between SES and GPA (see Table 4).

### **Discussion**

The results support an association between the economic components of risk and academic achievement. We found a significant positive correlation between father’s education level and GPA. This finding is consistent with past research, as researchers have shown that socioeconomic status is positively related to academic outcomes

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(Swanson et al., 2012). We add to the literature by demonstrating that being in a low SES family, as indicated by father's education level, may put adolescents at risk for lower academic achievement compared to adolescents from high SES families. This correlation may indicate an underlying issue of the systemic injustices which perpetuate school systems and adversely affect low income youth, as shown by disparities in standardized test scores and several other academic outcomes.

We did not find an association between negative life events and GPA. This may be due to floor effects, as most individuals had a score of 0 or 1 negative life events out of 10. The results would also be affected if students with relatively high negative life event scores have overcome the risks associated with their experiences. Some students may have certain resilience factors to protect against the stress of negative life events, which were not measured in the current study. Given the findings, we propose that the lack of relationship between these variables may be due to a resilience process already underway for those students who have experienced negative life events but not for students with the risks associated with low SES.

Within a protective model, we predicted that social support would moderate the relationship between SES and GPA. Though overall levels of social support were not significantly correlated with GPA, teacher social support was significantly positively correlated with GPA. This means that students whose teachers provided emotional support, like caring, and instrumental support, like helping with work, fared better academically. Additionally, teacher social support was associated with GPA, even when controlling for SES. Regardless of SES, students with teacher social support tended to have higher GPAs. While teacher support seems to be important to student success, it did

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not serve as a protective factor for individuals with risk associated with SES (see Table 3). Neither overall social support levels nor the social support subscales had a moderating effect on the relationship between SES and academic achievement. This is inconsistent with past research, which has shown that social support can serve as a protective factor for academic outcomes (Gutman et al., 2002). A larger sample size or more representative sample may be needed to show such an effect.

Self-regulated learning was positively correlated with academic achievement, such that individuals who used metacognitive strategies and learning strategies, and had motivational beliefs had higher achievement. Additionally, self-regulated learning was associated with GPA, even when controlling for SES. This means that, regardless of SES, students reporting higher levels of self-regulated learning tended to have higher GPAs. Contrary to our third hypothesis, self-regulated learning did not moderate the relationship between SES and GPA. Self-regulated learning did not particularly benefit low SES students in their academic achievement. This may be because self-regulated learning strategies are highly beneficial to all students, regardless of economic resources, as they encompass several of the crucial behaviors that promote effective learning.

Inconsistent with our fourth hypothesis, we did not find a correlation between growth mindset and GPA, and there was no association between growth mindset and GPA while controlling for SES. However, in additional analysis we found that students enrolled in honors classes had a significantly higher growth mindset than students not enrolled in honors classes,  $t(67) = 2.57, p = .01$ . As we recognize that GPA is one indicator of academic achievement, we consider enrollment in honors classes to be another gauge for achievement, given that honors levels classes typically include more

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challenging course content than non-honors classes. Given our results, growth mindset may serve as a promotive factor for the academic outcome of taking challenging classes, but not for grade outcomes. Our findings may indicate that having incremental beliefs of intelligence may vary in effect depending on the achievement context, measure or outcome.

We suggest that having growth mindset could lead students to challenge themselves in their coursework, but improving mindsets may not be enough to boost scores in the classroom as indicated by the lack of correlation between growth mindset and GPA. One could speculate that having growth mindset, self-regulated learning, and teacher social support is important in academic achievement, as both grade outcomes and taking challenging coursework are important for advancing to college.

Both teacher social support and self-regulated learning had significant positive correlations with GPA, though neither was found to have a moderating effect on the relationship between SES and GPA. Given these findings, we suggest that a compensatory approach would be appropriate for examining the relationship between our key factors, as they are strong predictors of academic outcomes. Teacher social support and self-regulated learning are significant promotive, rather than protective, factors for academic achievement. Our research informs resilience literature, as we suggest that both social support and self-regulated learning are promotive factors for academic achievement.

The finding that teacher social support is positively correlated with self-regulated learning is consistent with past literature. Ryan and Patrick (2001) researched classroom social environment and changes in engagement and motivation during middle school and

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found that increased self-regulated learning was positively associated with teacher support. Perceived social support from teachers may facilitate and promote the use of self-regulated learning strategies (Ryan & Patrick, 2001). The overlap between these two factors may be due to the role of teachers in promoting the motivational beliefs that are crucial aspect of self-regulated learning. Additionally, these findings are highly applicable as teacher support and self-regulated learning can be implemented in a school environment. Teachers and self-regulated learning strategies are resources that are readily available within schools, as teachers already play a vital role in classrooms, and additional reflection on learning and processing of material can be incorporated into the curriculum to encourage self-regulated learning.

We did not find a significant moderating effect of the three key factors on the relationship between SES and GPA. Yet, all three factors have been shown to serve as promotive factors for academic outcomes. These findings would further suggest that a compensatory model of resilience may be more relevant for teacher social support and self-regulated learning, in terms of GPA, and growth mindset, in terms of enrollment in challenging coursework.

### **Strengths and Limitations**

The external validity of the study was limited by convenience sampling; the majority of our students was from one Washington State public high school and enrolled in AVID (Advancement via Individual Determination). This is a class designated for students from low SES backgrounds to enhance their academic success. However, we also recruited students from five other high schools and we gathered data from a large sample. Another limitation is that a majority of the students had the same teacher, which

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may have accounted for the high levels of social support and self-regulated learning. We are unable to make conclusions about the causality of the relationships between social support, self-regulated learning, and GPA as our study is not longitudinal, which is an area future researchers could address. The scales for our key factors each have high reliability. Additionally, we believe that our social support, self-regulated learning, and growth mindset scales have strong validity and measure the constructs effectively.

### **Future Directions**

The current study has broad implications for the importance of teacher support and self-regulated learning in promoting academic success. Motivation is an influential aspect of human behavior and teachers play a crucial role in the motivation of their students. Teacher support can have a strong influence on one's motivation and engagement in school. Motivational beliefs are essential to self-regulated learning, which has been shown to be strongly related to academic achievement. Research should further investigate the relationship between teacher social support and self-regulated learning.

Academic achievement gaps persist despite programs like AVID, which promote the use of self-regulated learning within a supportive class environment. Future research should address how support classes like AVID may yield adaptive use of learning strategies and access to social support that boost academic achievement. Additionally, more research should investigate potential protective factors that may moderate the relationship between SES and academic outcomes.

It is not enough to provide students from low SES families with the promotive factors crucial for academic success to compensate for the risk associated with living in economic hardship. Protective factors should be identified so that schools can equip

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students with the assets and resources that provide resilience from the negative effects of stress and SES on access to resources and academic outcomes.

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## EFFECTS OF RISK AND PROMOTIVE FACTORS ON ACHIEVEMENT

Table 1

*Relations Among Key Variables*

	Variable								
	1	2	3	4	5	6	7	8	9
1. Negative Life Events	1.00	-.14	-.39***	-.46***	-.26*	-.21	-.35***	.14	.01
2. Father's Education Level		1.00	.13	.06	.22	.01	.06	-.10	.26*
3. Social Support			1.00	.85***	.80***	.76***	.52***	-.04	.16
4. Parent Social Support				1.00	.52***	.52***	.48***	-.09	.06
5. Friend Social Support					1.00	.37**	.27*	-.07	-.05
6. Teacher Social Support						1.00	.51***	.07	.44***
7. Self-Regulated Learning							1.00	.05	.28*
8. Growth Mindset								1.00	.14
9. Current G.P.A.									1.00

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p \leq .001$ .

## EFFECTS OF RISK AND PROMOTIVE FACTORS ON ACHIEVEMENT

Table 2

*Hierarchical Linear Regression Models Testing Moderators of Relations between Socioeconomic Status (SES) and Academic Achievement*

Step	Independent Variables	<i>b</i>	( <i>se</i> ) <i>b</i>	$\beta$	$R^2$
<i>Test of Social Support as a Moderator of SES on Grades</i>					
1	Socioeconomic status	.105*	.047	.262	.068
2	Socioeconomic status	.098*	.047	.245	.086
	Social support	.098	.088	.133	
3	Socioeconomic status	.097*	.048	.243	.086
	Social support	.098	.088	.132	
	Interaction	.011	.056	.023	
<i>Test of Self-regulated Learning as a Moderator of SES on Grades</i>					
1	Socioeconomic status	.105*	.047	.262	.068
2	Socioeconomic status	.098*	.046	.245	.138
	Self-regulated learning	.364*	.158	.265	
3	Socioeconomic status	.105*	.048	.263	.142
	Self-regulated learning	.362*	.158	.263	
	Interaction	-.062	.110	-.067	
<i>Test of Growth Mindset as a Moderator of SES on Grades</i>					
1	Socioeconomic status	.105*	.047	.262	.068
2	Socioeconomic status	.111*	.047	.279	.098
	Growth mindset	.141	.097	.172	
3	Socioeconomic status	.104*	.048	.260	.105
	Growth mindset	.161	.100	.195	
	Interaction	-.015	.020	-.093	

*Note.* \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p \leq .001$ .

## EFFECTS OF RISK AND PROMOTIVE FACTORS ON ACHIEVEMENT

Table 3

*Hierarchical Linear Regression Models Testing Social Support (Parent, Friend, and Teacher) Moderators of Relations between Socioeconomic Status (SES) and Academic Achievement*

Step	Independent Variables	<i>b</i>	( <i>se</i> ) <i>b</i>	$\beta$	$R^2$
<i>Test of Parent Social Support as a Moderator of SES on Grades</i>					
1	Socioeconomic status	.105*	.047	.262	.068
2	Socioeconomic status	.104*	.048	.259	.070
	Parent social support	.022	.067	.040	
3	Socioeconomic status	.101*	.048	.254	.079
	Parent social support	.016	.068	.028	
	Interaction	.036	.045	.097	
<i>Test of Friend Social Support as a Moderator of SES on Grades</i>					
1	Socioeconomic status	.105*	.047	.262	.068
2	Socioeconomic status	.115*	.048	.288	.081
	Friend social support	-.066	.068	-.117	
3	Socioeconomic status	.112*	.050	.279	.083
	Friend social support	-.057	.075	-.100	
	Interaction	.016	.019	.042	
<i>Test of Teacher Social Support as a Moderator of SES on Grades</i>					
1	Socioeconomic status	.105*	.047	.262	.068
2	Socioeconomic status	.103*	.042	.258	.260
	Teacher social support	.290***	.070	.438	
3	Socioeconomic status	.388	.200	.972	.283
	Teacher social support	.467***	.140	.705	
	Interaction	-.066	.045	-.779	

*Note.* \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p \leq .001$ .

## EFFECTS OF RISK AND PROMOTIVE FACTORS ON ACHIEVEMENT

Table 4

*Hierarchical Linear Regression Models Testing the Additive Effect of Protective Factors – Social Support, Self-regulated Learning, and Growth Mindset – on the Relationship between Socioeconomic status and Academic Achievement*

Step	Independent Variables	<i>b</i>	( <i>se</i> ) <i>b</i>	$\beta$	$R^2$
1	Socioeconomic status	.105*	.047	.262	.068
2	Socioeconomic status	.104*	.047	.261	.069
	High protective rating	.023	.257	.011	
3	Socioeconomic status	.104*	.049	.261	.069
	High protective rating	.023	.259	.011	
	Interaction	.003	.205	.002	

*Note.* \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p \leq .001$ .