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# RELATIONSHIPS AMONG STRESS, COPING, AND MENTAL HEALTH IN HIGH-ACHIEVING HIGH SCHOOL STUDENTS

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This study investigates the relationships among stress, coping, and mental health in 139 students participating in an International Baccalaureate (IB) high school diploma program. Mental health was assessed using both positive indicators (life satisfaction, academic achievement, academic self-efficacy) and negative indicators (psychopathology) of adolescent social-emotional and school functioning. Findings include that students in an IB program perceive significantly more stress than a sample of 168 of their general education peers, and that specific coping styles are differentially related to mental health outcomes in this subgroup of high-achieving high school students. Furthermore, coping styles (specifically, anger and positive appraisal) moderate the influence of stress on global life satisfaction and internalizing symptoms of psychopathology. © 2008 Wiley Periodicals, Inc.

Stress is a clear risk factor for mental health disorders, which have been estimated to affect approximately one in five children ages 9 to 17 years (U.S. Department of Health and Human Services, 1999). Adolescence is a developmental period when children may be particularly vulnerable to the negative effects of stress. Data from the National Youth Risk Behavior Survey indicate that 8.5% of teens had attempted suicide, 29% had felt sad or hopeless, 45% had used alcohol in the last month, and 22% had used marijuana (Centers for Disease Control and Prevention, 2004). These symptoms of mental disorders have been linked to the negative effects of stress (Chassin, Ritter, Trim, & King, 2003; Compas, Orosan, & Grant, 1993; Little & Garber, 2004; Schmeelk-Cone & Zimmerman, 2003). If these problems are not addressed, adolescents are at risk for compromised physical and mental health as adults (Loeber & Farrington, 2000).

The term *stress* has been defined in multiple ways throughout the literature (Mason, 1975), yielding medical, environmental, and psychological models of stress (McNamara, 2000). In the medical model, stress is a state of distress in an individual in response to an environmental precipitant. This physiological response of an organism can be measured by increased heart rate, elevated blood pressure, and the presence of hormones and neurotransmitters (i.e., cortisol, adrenaline, norepinephrine) that heighten the arousal of an organism (Selye, 1993). Distress, occurring within a normal range, is adaptive in nature; this heightened arousal prepares an organism to effectively deal with stress. However, in the long term, chronic stimulation of the stress-response system has been linked to depressed immune functions (Stein & Miller, 1993) and diminished life satisfaction (Evans, Bullinger, & Hygge, 1998).

In the environmental model, stress is defined as external to an organism, including threats of immediate harm or aversive environmental conditions. Stress of this type is typically measured using stress inventories, which are checklists of events believed to be taxing to an individual. External stress has been linked to such negative outcomes as anxiety, depression, and aggression (Jaser et al., 2005), as well as academic underachievement (Alva & de Los Reyes, 1999; Cunningham, Hurley, Foney, & Hayes, 2002), substance abuse (Chassin et al., 2003), and compromised life satisfaction (McKnight, Huebner, & Suldo, 2002). Although biological and environmental stress have both been linked to negative outcomes for adolescents, neither conceptualization of stress sufficiently explains why some adolescents who experience these types of stress do not experience the negative outcomes others have been found to manifest.

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Psychological models focus on the concept of perceived stress, which refers to interactions between an environmental precipitant (external stress); the physiological reactions of the body (distress); and a person's cognitive, emotional, and behavioral response to this interaction. Stress is perceived when an external event causes aversive physiological and cognitive distress in an individual that exceeds his or her emotional and behavioral repertoire designed to negate the harmful effects of external stressors. The conceptualization of perceived stress allows for consideration that certain individuals may possess resources, such as coping, that allow them to experience external stress without experiencing compromised functioning. In recent years, this transactional perspective of stress (Lazarus & Folkman, 1984) has come to be regarded as the most widely accepted and cited definition of stress (Grant et al., 2003; Hess & Copeland, 2006). Children and adolescents who report high levels of perceived stress are at high risk for negative outcomes, such as depression (Martin, Kazarian, & Breiter, 1995), substance abuse (Galaif, Sussman, Chou, & Wills, 2003), academic underachievement (Schmeelk-Cone & Zimmerman, 2003), and diminished life satisfaction (Mayberry & Graham, 2001).

Sources of external stress in adolescents include normative stressors (i.e., developmental challenges inherent to adolescence, such as puberty, school transitions, increased academic demands), nonnormative stressful life events (e.g., divorce, deaths), and daily hassles (e.g., chronic stressors such as parent–child conflict and academic pressure) (McNamara, 2000). Although parents and teachers are often sensitive to the occurrence of nonnormative stressful events in adolescents' lives, the normative stressors and accumulated daily hassles (in particular, school-related stressors) that teenagers experience without such fanfare also predict their mental health (Carter, Garber, Ciesla, & Cole, 2006). The coping behaviors that adolescents engage in to deal with stress may help explain why certain adolescents experiencing stressors adapt effectively.

Coping is defined as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person," regardless of whether the outcomes of such efforts are positive or negative (Lazarus & Folkman, 1984, p. 141). Several studies have investigated the coping behaviors of adolescents who are faced with extreme stressors (see Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001); less is known about how adolescents cope with normative and daily stress, such as stress from academic demands.

Coping, in research on adults, is most commonly defined as either problem- or emotion-focused. In problem-focused coping, an individual engages in behaviors to specifically address the sources of stress, whereas in emotion-focused coping, an individual engages in activities to alleviate the emotional distress caused by a stressor (Lazarus & Folkman, 1984). Although it is unclear if adolescent coping behaviors can be correctly dichotomized along these same two dimensions (Band & Weisz, 1988; Compas et al., 2001), problem- and emotion-focused coping are linked to specific outcomes in adolescent populations. For example, adolescents who cope with stress by seeking social support or ventilating their feelings (emotion-focused) are more likely to use cigarettes, alcohol, and marijuana than adolescents who work to solve family problems or seek spiritual guidance (problem-focused) (Patterson & McCubbin, 1987). Emotion-focused coping strategies are also linked to depression, conduct problems, and aggression (Tolan, Gorman-Smith, Henry, Chung, & Hunt, 2002).

Studies linking perceived stress and coping behaviors to mental health outcomes have found that these variables reciprocally influence each other. For instance, perceived stress is both a predictor and an outcome of depression, and anger coping strategies employed to deal with stress actually exacerbate it, while use of adaptive coping strategies decreases perceived stress (Galaif et al., 2003). As perceived stress is linked to such negative outcomes as substance abuse and psychopathology (Schmeelk-Cone & Zimmerman, 2003), coping strategies that serve to increase perceived stress may place adolescents at increased risk for experiencing mental health problems.

The literature on stress and coping in adolescent populations is limited by a focus on negative indicators of mental health (i.e., psychopathology), with less attention paid to important positive indicators of adolescent functioning (e.g., academic achievement, life satisfaction). Importantly, the absence of mental *illness* does not equate to the presence of mental *health*; instead, "the absence of disease may constitute a necessary, but not sufficient, criterion for mental health" (Jahoda, 1958, p. 15). One notable model of mental health that includes indicators that measure beyond a negative or neutral point to desirable levels of functioning examines adolescent adjustment in two domains: school functioning (e.g., academic achievement, perceptions of academic competence) and social-emotional development (e.g., subjective well-being, psychopathology) (Roeser, Eccles, & Sameroff, 2000). Using this model, mental health can be examined in terms of traditional indicators of psychopathology as well as the presence of positive indicators of optimal functioning, such as happiness (i.e., life satisfaction) and academic success. Such a focus on positive individual traits and experiences is consistent with the intent of the positive psychology movement (Moore & Lippman, 2005; Seligman & Csikszentmihalyi, 2000).

In addition, the majority of research on stress and coping strategies has focused on the role they play in the development of psychopathology for high-risk populations, such as youth living in adverse environmental conditions (Evans et al., 1998; Gonzales, Tein, Sandler, & Friedman, 2001), minority populations (Alva & de Los Reyes, 1999; Schmeelk-Cone & Zimmerman, 2003), and psychiatric inpatients (Martin et al., 1995), with scant attention to the influence stress and coping have on mental health outcomes in high-achieving youth.

Students who participate in rigorous academic programs provide a unique opportunity for researchers to investigate the role that stress and coping play in predicting positive outcomes, such as superior academic functioning. In addition to the developmental and biological challenges that are normative to adolescence, students in academically challenging curricula likely face additional normative stressors related to school (e.g., increased workload and more high-stakes tests) and daily hassles related to pressure to achieve. A large majority of students enrolled in advanced academic programs successfully attain the high academic standards set forth for them by their parents and teachers. However, little is known about the impact of stress on the social-emotional functioning of high-achieving students. Similarly, coping behaviors that might offset the negative influence of stress have yet to be identified.

One example of a challenging academic program specifically designed for academically advanced high school students is the International Baccalaureate (IB) diploma program, currently in place in approximately 1,500 schools worldwide (International Baccalaureate Organization [IBO], 2005). Throughout high school, students in the IB program are engaged in research, community service, and challenging curricula, far beyond state requirements for high school graduation. Logically, the heavy academic workload experienced by IB learners during their high school years should contribute to increased stress (e.g., Kouzma & Kennedy, 2002) because these academic requirements are completed while learners experience other normative stressors inherent to typical adolescent development. Despite extraordinary academic demands, students in this program do not appear to experience the impairments in academic functioning that have co-occurred with high stress in other unique secondary school populations, including ethnic minority and at-risk youth (Cunningham et al., 2002; Gillock & Reyes, 1999). A preliminary study of the mental health of students in an IB program found that their academic functioning (i.e., perceptions of academic abilities, grade point averages) was superior to that of peers in a general education curriculum, and that these two groups of students reported comparable levels of social-emotional functioning, such as life satisfaction and psychopathology (Shaunessy, Suldo, Hardesty, & Shaffer, 2006). These results suggest that students in the IB program are capable of managing academic demands without deleterious effects on their social-emotional functioning.

Although it should be noted that the aforementioned study did not test for group differences in stress, the academic demands inherent to the IB program contradict the notion that stress is always associated with poor functioning, underscoring the importance of conducting research on stress and coping with high-achieving and/or high-ability populations rather than assuming the body of research on at-risk groups simply generalizes to these populations. Case in point, research has found that the coping behaviors of students identified as intellectually gifted are unique; specifically, elementary-age gifted children are more likely than their age-matched peers to use problem-focused coping strategies to deal with school-related and interpersonal stressors (Preuss & Dubow, 2004). High-achieving and/or academically advanced students, such as those who elect to participate in the IB program and other rigorous curricula, may be another group who are unique in terms of stress, coping, and mental health. Indeed, focus groups with low-, moderately, and high-achieving students have revealed that although students at all levels mentioned use of common coping styles (e.g., substance use, avoidance, rebellion against authority), students in the advanced academic track reported unique ways to cope through rebellious behavior (Mates & Allison, 1992). Understanding the needs of students in rigorous curricula is particularly important due to the increasing popularity of enrollment in specialized college preparatory curricula, such as the IB program and Advanced Placement (AP) classes, during high school (Kantrowitz & Wingert, 2006).

This study investigated the levels of perceived stress, as well as links between stress and mental health, in such a sample through focusing on students in a high school IB program. First, the perceived stress of students in an IB program was compared to that of a sample of same-age students in a regular education curriculum in order to determine if additional academic requirements are indeed associated with increased stress levels. A second purpose of this study was to examine the interrelationships among stress, coping, and mental health, and determine which coping styles are most predictive of mental health outcomes within high-achieving students. Mental health was assessed comprehensively (cf. Roeser et al., 2000), and operationalized as school functioning (academic achievement, academic self-efficacy) and positive and negative indicators of social-emotional functioning (life satisfaction, psychopathology). Finally, the notion that coping moderates the relationship between perceived stress and mental health among high-achieving students was tested. Specific coping styles that serve to exacerbate or mitigate the effects of stress were identified.

## Method

### *Participants*

Participants in this study consisted of students enrolled in one high school in a rural southeastern state; the school was selected because it houses both an IB program and a general education curriculum in a single school building. Although there are two separate principals and administrative staff at the school (one for each curriculum), students share facilities and faculty. Students in the IB program must meet the graduation requirements set forth by their state while concurrently completing the IBO requirements (see www.ibo.org/diploma). Students in the general education program are only expected to meet the graduation requirements set forth by their state, although students are permitted to enroll in AP classes that exceed these basic requirements.

Participation was sought from all students in the school ($N = 1{,}050$). A higher percentage of students in the IB program (65%) than general education students (20%) secured parental consent to participate. In total, 322 students participated in the study; 13 participants were removed from the data set after they were identified as univariate or multivariate outliers, and 2 participants were removed because the curriculum in which they participated could not be verified, leaving a final sample of 307 students. The final sample included 139 students in the IB program and a comparison sample of 168 peers from the general education curriculum. As shown in Table 1, the majority of

Table 1
*Descriptive Statistics for Participants in the International Baccalaureate Program (n = 139) and General Education Curriculum (n = 168)*

| | International Baccalaureate | | General Education | | Total Sample | |
|---|---|---|---|---|---|---|
| Variable | *n* | % | *n* | % | *N* | % |
| Gender | | | | | | |
| Male | 54 | 39 | 44 | 26 | 98 | 32 |
| Female | 85 | 61 | 124 | 74 | 209 | 68 |
| Grade | | | | | | |
| 9 | 45 | 32 | 56 | 33 | 101 | 33 |
| 10 | 31 | 22 | 63 | 38 | 94 | 31 |
| 11 | 30 | 22 | 22 | 13 | 52 | 17 |
| 12 | 33 | 24 | 27 | 16 | 60 | 20 |
| Ethnicity | | | | | | |
| Caucasian | 95 | 68 | 117 | 70 | 212 | 69 |
| African American | 4 | 3 | 26 | 15 | 30 | 10 |
| Asian | 23 | 17 | 2 | 1 | 25 | 8 |
| Hispanic/Latino | 10 | 7 | 15 | 9 | 25 | 8 |
| Native American | 1 | <1 | 1 | <1 | 2 | <1 |
| Other | 6 | 4 | 7 | 4 | 13 | 4 |
| Socioeconomic status | | | | | | |
| Low | 9 | 6 | 51 | 31 | 60 | 20 |
| Average/high | 130 | 94 | 116 | 69 | 246 | 80 |
| Gifted status | | | | | | |
| Identified by district | 50 | 36 | 3 | 2 | 53 | 17 |
| Not identified | 89 | 64 | 165 | 98 | 254 | 83 |

participants in both curriculum groups are Caucasian, female, and of average to high socioeconomic status (i.e., did not report qualifying for free or reduced school lunch). Participants were 14 to 19 years old ($M = 15.74$, $SD = 1.25$). Of note, the database analyzed in this study is part of a larger study investigating the mental health of students participating in different high school curricula (Shaunessy et al., 2006).

*Procedures*

Written approval to conduct the study was received from the participating school district and the principal investigator's university Institutional Review Board. In the fall of 2004, a letter explaining the study and requesting parental permission for students' participation was sent home to parents of all students at the high school. Although students were not paid for participation, incentives (e.g., gift certificates to the local mall) were offered to increase the rate of participation. In the winter of 2004, student assent was sought from all students who returned signed parental consent forms. In groups of approximately 50 to 100, students who assented to participate completed the measures below and a brief demographic questionnaire. In an effort to control for order effects, six versions of the questionnaire packet were administered. Each version contained the self-report measures in a different order; participants were randomly assigned one of the six versions to complete. The manuscript authors and additional research assistants were on hand throughout the administration of the questionnaires to assist students with questions and check for response errors.

*Measures*

*Perceived Stress Scale.* The original Perceived Stress Scale (PSS; Cohen, Kamarck, & Mermelstein, 1983) consisted of 14 items that required respondents to indicate, on a 5-point scale (0 = never to 4 = very often), the degree to which they "found their lives unpredictable, uncontrollable and overloading" (Cohen et al., 1983, p. 387). Subsequent research on the validity of the PSS has identified a two-factor solution in which the six negatively phrased items (e.g., in the last month, how often have you. . . (a) felt nervous or stressed, (b) felt that you were unable to control the important things in your life, and (c) felt difficulties were piling up so high that you could not overcome them) load on a single factor reflecting perceived distress (Golden-Kreutz, Browne, Frierson, & Anderson, 2004), while the second factor reflects perceived coping ability (Martin et al., 1995). In this study, the PSS items that measure coping were not administered because a more comprehensive measure of coping was included. The mean of the six distress items was used to reflect perceived stress.

Because the PSS measures the extent to which one appraises his or her particular life situation to be stressful, it is not tied to the assessment of specific hassles or life events. Instead, the PSS reflects the transactional nature of stress. In contrast, objective measures (i.e., checklists of stressful life events) assume that the intensity or quality of stress in the environment is linked to negative outcomes and ignore findings that suggest that negative outcomes associated with stress are determined by the way a person perceives the stressor rather than an inherent quality of the stressor itself (Galaif et al., 2003). The PSS has been used with adolescents, both in clinical and normal populations, to predict such outcomes as depression, anxiety, and underachievement (Martin et al., 1995; Schmeelk-Cone & Zimmerman, 2003). In this study, a Cronbach's alpha of 0.91 was obtained for the six-item PSS.

*Adolescent Coping Orientation for Problem Experiences.* The Adolescent Coping Orientation for Problem Experiences (ACOPE; Patterson & McCubbin, 1987) is a 54-item self-report coping inventory designed to identify the behaviors that adolescents use most frequently to manage problems of difficult situations. Items are presented on a 5-point scale (1 = never to 5 = most of the time). The ACOPE purports to identify 12 coping patterns. Because researchers using the ACOPE have found different factor structures that tend to be sample specific (cf. Copeland & Hess, 1995), an exploratory factor analysis was conducted using data from the 322 participants in this study to determine the factor structure most appropriate for use. A four-factor model consistent with the findings of Fanshawe and Burnett (1991) emerged, reflecting the coping styles of positive appraisal, negative avoidance, family communication, and anger. Of note, more recent research with high school students successfully used this four-factor version of the ACOPE to examine adolescents' preferred coping styles in relation to their attachment styles (Howard & Medway, 2004). In the current study, Cronbach's alpha for each variable indicated questionable to acceptable internal consistency (0.76, 0.73, 0.69, and 0.69, respectively).

*Positive appraisal* coping consisted of five items: (a) try to think about the good things in your life, (b) try to see the good things in a difficult situation, (c) try to keep up friendships or make new friends, (d) say nice things to others, and (e) be close with someone you care about. These items comprising positive appraisal coping involve strategies designed to positively appraise stressful situations or solicit the support of others in times of stress. *Negative avoidance* coping consisted of four items: (a) use drugs prescribed by a doctor; (b) use drugs not prescribed by a doctor; (c) drink beer, wine, or liquor; and (d) smoke. Negative avoidance coping items all involve the use of substances to cope in the face of stress. The five items comprising the *family communication* subscale were (a) talk to your father about what bothers you; (b) talk to your mother about what bothers you; (c) do things with your family; (d) try to reason with parents and talk things out, or compromise; and (e) go along with parents' requests and rules. All family communication items

involve relying on family members for social support in times of stress. *Anger coping* consisted of five items: (a) get angry and yell at people; (b) blame others for what's going wrong; (c) say mean things to people or be sarcastic; (d) let off steam by complaining to your friends; and (e) let off steam by complaining to family members. All items involve ways of expressing emotions outwardly, either directly (e.g., let off steam by complaining) or indirectly (e.g., say mean things to others).

*The Youth Self-Report form of the Achenbach System of Empirically Based Assessment.* The Youth Self-Report (YSR; Achenbach & Rescorla, 2001) is a 112-item questionnaire that assesses eight areas of problem behavior and was designed for use with adolescent populations ranging in age from 11 to 18 years. Items are presented using a 3-point scale (0 = not true to 2 = very true or often true) and respondents assess how true each item is for them currently (i.e., within the past 6 months). In this study, only the internalizing and externalizing composite scores were used in data analyses. The internalizing scale consists of items loading on the subscales anxious/depressed, withdrawn/depressed, and somatic complaints. The externalizing scale consists of rule breaking and aggressive behaviors.

The YSR is useful in identifying children with symptoms of psychopathology. For instance, all items on the YSR have been found to discriminate between clinical populations of adolescents and nonreferred samples (Achenbach & Rescorla, 2001). Test–retest reliability at 8 days obtained coefficient alphas ranging from 0.80 to 0.90. Reliability was high in this study, with Cronbach's alpha above 0.90 for both internalizing and externalizing composites.

*Students' Life Satisfaction Scale.* The Students' Life Satisfaction Scale (SLSS; Huebner, 1991) consists of seven items assessing global life satisfaction in children. Respondents are asked to indicate on a 6-point scale (1 = strongly disagree to 6 = strongly agree) the degree to which they endorse statements about the quality of their lives. Individuals' scores are obtained by reverse coding negatively phrased items, and then summing the responses and dividing by 7. Higher scores represent higher levels of life satisfaction.

The SLSS has been used in previous research with high school students (Huebner, Funk, & Gilman, 2000). Test–retest reliability has been reported to range from 0.70 to 0.80. Validity of the SLSS has been supported through correlations between parent reports and self-reports of well-being (Huebner, 1991). Cronbach's alpha was 0.88 in this study, indicating high reliability.

*Self-Efficacy Questionnaire for Children.* The Self-Efficacy Questionnaire for Children (SEQ-C; Muris, 2001) is a 21-item self-report scale designed to assess three domains of self-efficacy: (a) social, (b) academic, and (c) emotional. Respondents indicate on a 5-point scale (1 = not at all to 5 = very well) their perceived capabilities on each item. Only the 7 items measuring academic self-efficacy (perceived ability to succeed in school and demonstrate appropriate learning behaviors) were analyzed in this study.

Scores on the SEQ-C are negatively correlated with symptoms of psychopathology, including depression ($r = -0.57$) and anxiety ($r = -0.62$) (Muris, 2001, 2002). The SEQ-C has been used with adolescent populations ranging from 12 to 19 years of age, suggesting that this instrument is appropriate for use with high school students. Cronbach's alpha for the academic self-efficacy subscale was 0.86 in this study.

*Grade Point Average.* Cumulative grade point averages (GPAs) were obtained from school records; GPA was calculated by summing numerical values assigned to letter grades earned for academic performance (e.g., A = 4.0, B = 3.0) and dividing by the total number of credit hours attempted. A weighting procedure used by the school to provide additional credit to students for attempting advanced coursework resulted in GPA values that exceed 4.0. Specifically, an additional

half point was awarded for grades earned in honors classes (A = 4.5 to D = 1.5), and an additional whole point awarded for grades earned in college-level classes such as IB and AP (A = 5.0, etc.). In all classes, zero points were awarded for grades of F.

*Overview of Analysis Plan*

To determine if students in the IB program differed from students in general education in perceived stress, an independent samples *t*-test was conducted with IB status as the grouping variable. Because the relationships between perceived stress, coping styles, and mental health in students in the IB program were the primary focus of this study due to the focus on high-achieving youth, only data for the subgroup of students in the IB program were retained for further analyses. Correlation coefficients were calculated to determine the relationships between perceived stress, coping styles, and mental health indicators in the sample of students in the IB program. To determine which coping styles were most predictive of mental health outcomes in high-achieving students, data from the sample of students in the IB program were subjected to a series of five simultaneous multiple regression analyses; separate regression analyses were conducted for each mental health outcome variable (GPA, academic self-efficacy, life satisfaction, internalizing behavior, externalizing behavior). In each regression analysis, coping styles (as derived from the ACOPE) were entered as the predictor variables. Beta weights (standardized regression coefficients) were examined to determine the relative importance of the various predictor variables. To test for moderation, a series of five regression analyses were conducted using the indicators of mental health (academic achievement, life satisfaction, psychopathology) as the dependent/criterion variable and perceived stress, coping styles, and the interaction of stress and coping styles as the predictors/independent variables using the data from the sample of students in the IB program. A moderator variable changes the direction or strength between an independent variable (in this case, perceived stress) and dependent variable (in this case, mental health). A moderator is identified when the effect of one variable depends on the levels of another, or simply stated, an interaction effect is found (Baron & Kenny, 1986).

## Results

*Group Differences in Perceived Stress*

Students in the IB program reported significantly higher scores on the PSS than students not enrolled in the IB program ($t = -2.77$, $p < .01$). The range of possible scores was 1 to 5; the mean score for students in the IB program was 3.42 ($SD = 0.86$), compared to a mean of 3.11 ($SD = 1.03$) for students in the general education curriculum. Cohen's *d* for this difference was 0.32, indicating a small effect size.

*Relationships Among Stress, Coping, and Mental Health Outcomes*

As aforementioned, all subsequent analyses exclude data for the comparison sample of students in general education. To assess univariate normality, skew and kurtosis of all predictor and criterion measures were calculated. All obtained values, with the exception of negative avoidance coping (skew = 1.67, kurtosis = 2.74), were between −1.0 and +1.0, demonstrating a normal distribution of scores on each target variable. The negative avoidance coping variable was transformed by taking the logarithm of the variable. Although skew and kurtosis obtained acceptable levels on transformation (skew = 1.04, kurtosis = 0.15), the pattern and magnitude of the correlations between the logarithm of negative avoidance and other variables of interest did not change when the nontransformed variable was substituted for the logarithm of negative avoidance. Therefore, the original form of the variable was retained and used for further data analyses.

Pearson product-moment correlations among all continuous variables included in analyses are presented in Table 2. Perceived stress was positively correlated with psychopathology (internalizing and externalizing) and negatively correlated with positive indicators of mental health (i.e., academic self-efficacy, life satisfaction). The small correlations between most coping styles (i.e., $r = 0.03$ to $r = 0.12$) indicate that the coping variables can be used in regression analyses without risking multicollinearity. Notably, the moderate correlation between family communication coping and positive appraisal coping ($r = 0.44$) will make it difficult for these variables to contribute much unique variance to equations in which they are both included.

*Social-Emotional Functioning.* To determine the extent to which coping styles predicted life satisfaction, all four coping styles (i.e., positive appraisal, negative avoidance, family communication, anger) were entered into a simultaneous multiple regression equation. Coping accounted for almost one-third of the variance in global life satisfaction ($F[4,134] = 15.19$, $p < .001$, $R^2 = 0.31$). As shown in Table 3, after controlling for the shared variance among the four coping styles, each was independently related to differences in students' global life satisfaction. Specifically, positive appraisal coping ($\beta = 0.17$) and family communication ($\beta = 0.38$) were related to increased global life satisfaction, whereas the negative direction of the beta weights for negative avoidance ($\beta = -0.30$) and anger coping ($\beta = -0.18$) indicated that more frequent use of these coping styles is related to diminished life satisfaction. The magnitude of the beta weights associated with family communication and negative avoidance suggest that these two coping styles are stronger predictors of life satisfaction than positive appraisal or anger coping. Uniqueness indices were reviewed to determine the relative contribution of each coping style after controlling for the variance accounted for by the three other coping styles. Notably, after controlling for the contributions of other coping styles, family communication alone accounted for 12% of the variance in life satisfaction ($sr^2 = 0.12$).

Two separate regression equations were computed for internalizing and externalizing psychopathology. Coping styles predicted a significant amount of the variance in internalizing symptoms ($F[4,134] = 6.85$, $p < .001$, $R^2 = 0.17$) and externalizing symptoms ($F[4,133] = 22.01$, $p < .001$, $R^2 = 0.40$). As shown in Table 3, negative avoidance coping was the strongest predictor of internalizing behavior ($\beta = 0.31$), while anger coping was the strongest predictor of externalizing behavior ($\beta = 0.47$). Family communication was strongly inversely related to externalizing behavior ($\beta = -0.44$), whereas negative avoidance was moderately positively related to externalizing behavior ($\beta = 0.22$). Family communication accounted for 15%, and anger coping accounted for 22% of the variance in externalizing behavior, after controlling for the contributions of other coping styles in predicting this outcome. After controlling for the contributions of other coping styles, anger and negative avoidance coping ($sr^2 = 0.06$, $sr^2 = 0.09$, respectively) both made unique contributions in predicting internalizing behavior; positive appraisal coping and family communication were not related to internalizing psychopathology.

*School Functioning.* The regression equation using coping styles to predict GPA was not statistically significant ($F[4,134] = 2.03$, $p = .09$). Coping styles predicted academic self-efficacy ($F[4,134] = 7.66$, $p < .001$, $R^2 = 0.19$). Family communication emerged as the strongest predictor ($\beta = 0.39$, $sr^2 = 0.12$); no other coping styles independently predicted academic self-efficacy.

### *Coping as a Moderator Between Stress and Mental Health*

To test for moderation, a series of five separate regression analyses were conducted using the indicators of mental health (academic achievement, life satisfaction, psychopathology) as the dependent/criterion variables and perceived stress, coping styles, and the interaction of stress and coping styles (e.g., stress*positive appraisal, stress*negative avoidance, stress*family communication,

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Table 2
*Intercorrelations Between Predictor and Criterion Variables (N = 139)*

| Variable | Mean | *SD* | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Perceived stress | 3.42 | 0.86 | 1 | | | | | | | | |
| 2. Positive appraisal | 3.30 | 0.77 | −0.13 | 1 | | | | | | | |
| 3. Negative avoidance | 1.21 | 0.35 | 0.13 | 0.11 | 1 | | | | | | |
| 4. Family communication | 2.96 | 0.77 | −0.19* | 0.44** | 0.12 | 1 | | | | | |
| 5. Anger | 2.80 | 0.72 | 0.29** | 0.03 | 0.06 | 0.08 | 1 | | | | |
| 6. Internalizing | 15.10 | 8.72 | 0.72** | −0.11 | 0.30** | −0.09 | 0.25** | 1 | | | |
| 7. Externalizing | 10.73 | 5.38 | 0.40** | −0.13 | 0.20* | −0.35** | 0.44** | 0.51** | 1 | | |
| 8. Academic self-efficacy | 3.79 | 0.66 | −0.36** | 0.22** | −0.02 | 0.40** | −0.12 | −0.35** | −0.42** | 1 | |
| 9. Grade point average | 4.14 | 0.37 | −0.15 | 0.08 | −0.03 | 0.23* | 0.06 | −0.10 | −0.20* | 0.49** | 1 |
| 10. Life satisfaction | 4.04 | 0.92 | −0.63** | 0.30** | −0.25** | 0.41** | −0.16* | −0.60** | −0.45** | 0.48** | 0.16 |

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

Table 3
*Summary of Simultaneous Regression Analyses for Coping Styles Predicting Mental Health Outcome (N = 139)*

| | Parameter Estimates | | | Uniqueness Indices | |
|---|---|---|---|---|---|
| Predictors | *B* | SE *B* | ß | $sr^2$ | $F\ sr^2$ |
| Life Satisfaction | | | | | |
| 1. Positive appraisal | 0.21 | 0.10 | 0.17* | 0.02 | 4.59* |
| 2. Negative avoidance | −0.79 | 0.19 | −0.30** | 0.09 | 17.33** |
| 3. Family communication | 0.46 | 0.10 | 0.38** | 0.12 | 22.46** |
| 4. Anger | −0.24 | 0.09 | −0.18* | 0.03 | 6.56* |
| Internalizing Behavior | | | | | |
| 1. Positive appraisal | −1.16 | 0.99 | −0.10 | 0.01 | 1.37 |
| 2. Negative avoidance | 7.62 | 1.98 | 0.31** | 0.09 | 14.88** |
| 3. Family communication | −1.12 | 1.00 | −0.10 | 0.01 | 1.23 |
| 4. Anger | 2.89 | 0.95 | 0.24** | 0.06 | 9.19** |
| Externalizing Behavior | | | | | |
| 1. Positive appraisal | 0.17 | 0.52 | 0.02 | 0.00 | 0.10 |
| 2. Negative avoidance | 3.34 | 1.03 | 0.22** | 0.05 | 10.36** |
| 3. Family communication | −3.10 | 0.54 | −0.44** | 0.15 | 32.93** |
| 4. Anger | 3.49 | 0.50 | 0.47** | 0.22 | 47.86** |
| Academic Self-Efficacy | | | | | |
| 1. Positive appraisal | 0.05 | 0.07 | 0.06 | 0.00 | 0.44 |
| 2. Negative avoidance | −0.12 | 0.15 | −0.07 | 0.00 | 0.70 |
| 3. Family communication | 0.34 | 0.08 | 0.39** | 0.12 | 19.96** |
| 4. Anger | −0.13 | 0.07 | −0.15 | 0.02 | 3.54 |

$^{*}p < .05$, $^{**}\ p < .01$.

stress*anger) as the predictors/independent variables. All predictor variables were centered by subtracting the group mean from each predictor variable.

To first detect an overall effect of coping styles as moderators in the relationship between stress and mental health, the $R^2$ values for each full regression model that included stress and coping, and the interaction terms, were compared with the base model (e.g., each mental health variable predicted by stress and coping styles, *excluding* interaction terms). This change in $R^2$ (i.e., full model-base model) was calculated to detect a significant change in the proportion of variance accounted for by the interaction terms. Of the five $R^2$ change tests (i.e., one test for each indicator of mental health), two significant changes in $R^2$ were found: life satisfaction ($F[4, 129] = 3.5$, $p < .05$, $\Delta R^2 = 0.04$) and internalizing behavior ($F[4,129] = 2.67$, $p < .05$, $\Delta R^2 = 0.03$). Results are presented in Table 4.

To determine which interaction was driving each effect, the beta weights and corresponding *t*-test for each interaction term were examined. For life satisfaction, the interaction between stress and positive appraisal coping was significant ($\beta = 0.16$, $t = 2.20$, $p < .05$). For internalizing behavior, the interaction between stress and anger coping was significant ($\beta = 0.16$, $t = 2.68$, $p < .05$). No other interaction terms were significant in either full model, so the regression equations were simplified by dropping nonsignificant interaction terms from the equation and rerunning each regression using the base model (i.e., stress and the four coping variables to predict life satisfaction and internalizing behavior, respectively). The coping variables that were significant in the interaction terms were dichotomized into high and low frequency of use and used as a grouping variable to illustrate the

Table 4
*Coping Styles as Moderators in the Relationship Between Stress and Mental Health Outcomes (N = 139)*

| | *B* | SE *B* | ß | $R^2$ | $F\ R^2\Delta$ |
|---|---|---|---|---|---|
| Life Satisfaction | | | | | |
| Base Model | | | | 0.543 | |
| Full Model | | | | 0.585 | 3.5* |
| 1. Perceived stress | −0.52 | 0.07 | −0.48* | | |
| 2. Positive appraisal | 0.18 | 0.08 | 0.15* | | |
| 3. Negative avoidance | −0.49 | 0.16 | −0.18* | | |
| 4. Family communication | 0.32 | 0.08 | 0.26* | | |
| 5. Anger | 0.00 | 0.08 | 0.00 | | |
| 6. Stress*positive avoidance | 0.20 | 0.09 | 0.16* | | |
| 7. Stress*negative avoidance | −0.05 | 0.17 | −0.02 | | |
| 8. Stress*family communication | 0.08 | 0.08 | 0.07 | | |
| 9. Stress*anger | −0.18 | 0.10 | −0.12 | | |
| Internalizing Behavior | | | | | |
| Base Model | | | | 0.569 | |
| Full Model | | | | 0.602 | 2.67* |
| 1. Perceived stress | 6.56 | 0.63 | 0.65* | | |
| 2. Positive appraisal | −0.56 | 0.72 | −0.05 | | |
| 3. Negative avoidance | 4.16 | 1.49 | 0.17* | | |
| 4. Family communication | 0.78 | 0.73 | 0.07 | | |
| 5. Anger | 0.06 | 0.72 | 0.00 | | |
| 6. Stress*positive appraisal | −1.32 | 0.82 | −0.11 | | |
| 7. Stress*negative avoidance | 2.27 | 1.59 | 0.08 | | |
| 8. Stress*family communication | 0.28 | 0.78 | 0.03 | | |
| 9. Stress*anger | 2.39 | 0.89 | 0.16* | | |

*$p < .05$.

interaction in each regression equation. Subsequent regression analyses were conducted separately for each group (i.e., high, low).

*Internalizing Behavior.* To interpret the interaction effect, anger coping scores were used to assign students in the IB program to a high anger coping group and comparison subsample. The high anger coping group ($n = 78$) consisted of students who reported anger coping scored at or above the sample median ($Mdn = 2.8$). The low anger coping group ($n = 61$) consisted of students who scored below the median for the sample of students in the IB program. Hierarchical linear regression was used to predict internalizing behavior within a specific group (e.g., high anger coping) by entering the four coping styles first (step 1), followed by perceived stress (step 2). The slope of the association between perceived stress and internalizing behavior was steeper for students with high anger coping ($b = 8.36$, $p < .05$), meaning that as perceived stress increases, students who use more anger coping are more likely to experience internalizing disorders (Figure 1). On the other hand, for the low anger coping group, stress was not as strongly related to internalizing behavior ($b = 4.78$, $p < .05$).

*Life Satisfaction.* To interpret the interaction effect, positive appraisal coping scores were used to assign students in the IB program to a high positive appraisal coping group and comparison subsample. The high positive appraisal coping group ($n = 72$) consisted of students who reported positive appraisal coping at or above the sample median ($Mdn = 3.4$). The low positive appraisal coping group ($n = 67$) consisted of students in the IB program who scored below the median.

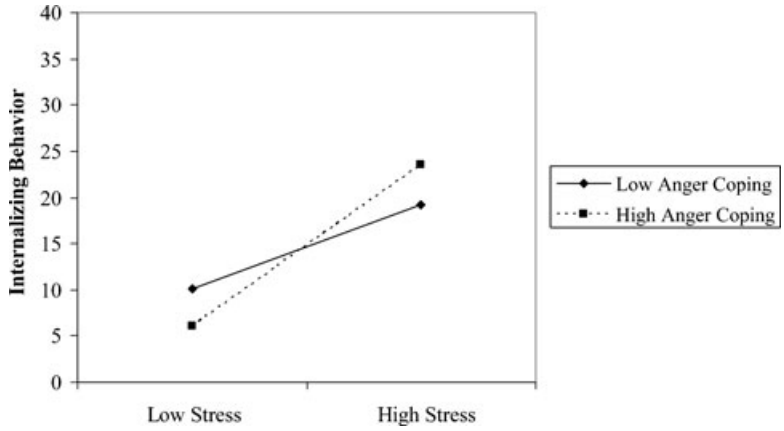


FIGURE 1. Predicted internalizing behavior for high-achieving students who have low and high use of anger coping.

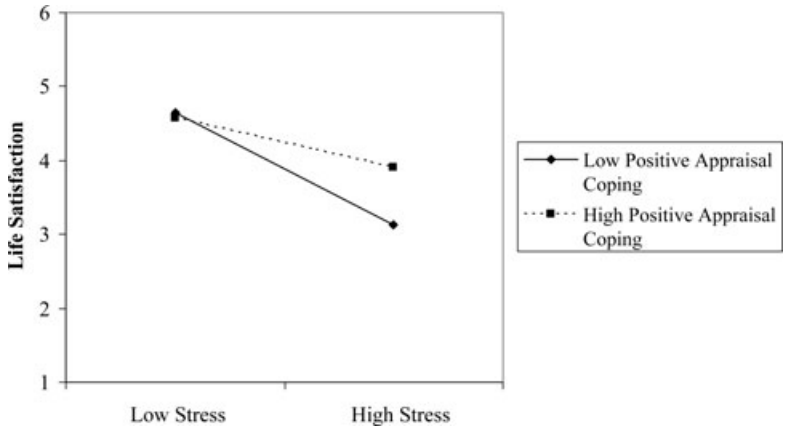


FIGURE 2. Predicted life satisfaction for high-achieving students who have low and high use of positive appraisal coping.

Hierarchical linear regression was used to predict life satisfaction by entering the four coping styles first (step 1), followed by perceived stress (step 2). The slope of the association between perceived stress and life satisfaction was steeper for students with low positive appraisal coping ($b = -0.70$, $p < .05$). Specifically, students who use positive appraisal behaviors to cope less frequently experience sharper declines in life satisfaction as stress increases (Figure 2). In contrast, for the high positive appraisal coping group, stress was not as strongly related to life satisfaction ($b = -0.44$, $p < .05$).

## DISCUSSION

To the best of our knowledge, this is the first systematic study of stress and coping among academically advanced adolescents in a rigorous high school program. Given the novelty of this line of research and the convenience sample employed, the reader should regard implications of results obtained in this pilot study as preliminary. This study exclusively examined adolescents enrolled in the IB program, a curriculum designed for highly motivated, high-achieving high school students. Overall, students in the IB program perceived more stress than students in the general

education curriculum. This is in line with hypotheses, as students in the IB program are immersed in an extremely challenging, demanding curriculum, while they also navigate the biological and developmental challenges unique to the adolescent period. de Anda et al.'s (2000) investigation of stressors most frequently encountered by high school students found that the majority of the adolescents surveyed reported that they often experienced stress related to studying for tests, getting good grades, completing homework, and managing time. As students in IB programs are frequently tested (students must pass advanced examinations), maintain extremely high GPAs ($M = 4.14$), and carry heavy homework loads while participating actively in their communities and extracurricular activities, it was expected that they would experience more stress than students enrolled in a more typical high school curriculum.

Despite the stress students in the IB program experience, the academic functioning of students in the IB program is superior to that of students in the general education curriculum (Shaunessy et al., 2006). This finding contrasts research by Cunningham et al. (2002), Gillock and Reyes (1999), and Alva and de Los Ryes (1999), who all found that increased stress was negatively correlated with GPA. Notably, these three studies focused on the relationship between stress and academic achievement using objective measures of stress (i.e., stressful life event checklists), sampled adolescents from minority backgrounds (i.e., African American, Hispanic), and did not specifically include high-achieving students. This study employed a measure of perceived stress, studied a sample of primarily Caucasian youth, and included a sample of exclusively academically advanced students.

Within the group of high-achieving students, higher levels of perceived stress co-occurred with compromised mental health. This finding is consistent with the large body of research demonstrating the negative impact of stress on mental health (e.g., Martin et al., 1995; Mayberry & Graham, 2001). In addition, perceived stress was positively correlated with anger coping. Because perceived stress was also associated with negative indicators of mental health, coping strategies that are positively correlated with perceived stress may place adolescents at increased risk for experiencing negative outcomes. This interpretation is consistent with the findings of Galaif et al. (2003), who also found a positive relationship between perceived stress and anger coping strategies, as well as positive correlations between perceived stress and internalizing psychopathology (i.e., depression). Family communication was negatively correlated with perceived stress, suggesting that family communication may be a more adaptive coping strategy for high-achieving students. Positive appraisal and negative avoidance coping were not significantly related to perceived stress, suggesting that these coping strategies neither mitigate nor exacerbate perceptions of stress for these students.

Coping was found to account for a significant portion of the variance in mental health outcomes in high-achieving students. For instance, coping accounted for almost one-third of the variance in global life satisfaction. Positive appraisal and family communication were associated with increased life satisfaction, while anger coping and negative avoidance were associated with diminished life satisfaction. Negative avoidance coping is primarily comprised of items related to substance abuse (e.g., smoking, drinking, illicit drug use); the finding that negative avoidance coping may serve to compromise life satisfaction is consistent with the findings of Zullig, Valois, Huebner, Oeltmann, and Drane (2001), who determined that the regular use of tobacco and alcohol products was significantly associated with reduced life satisfaction in adolescents. Thus, students who are able to find positive outlets when faced with stress (e.g., talking with family members, thinking positively, spending time with close friends/family members) are often happier with their lives.

Coping also accounted for a large portion of the variance in psychopathology, particularly with respect to externalizing behavior. Negative avoidance coping emerged as a strong predictor for internalizing behavior; high-achieving students who use substances such as alcohol or drugs to cope with stress are more likely to experience problems on the internalizing spectrum (e.g., depression,

anxiety), whereas students who use anger coping strategies (e.g., blaming others, yelling) are more likely to experience problems on the externalizing spectrum (e.g., aggression, conduct disorder). Galaif et al. (2003) also found that the use of maladaptive coping strategies (e.g., seeking revenge, getting mad, using drugs) elevates the risk for psychopathology.

In contrast to the strong links with social-emotional functioning, coping styles were less associated with school functioning. Although high-achieving students who are able to communicate with their families in times of stress perceived themselves as more academically competent, the other three coping styles were unrelated to academic self-efficacy. No coping style was associated with GPA, suggesting that the ways in which high-achieving students cope are not related to their ability to perform well academically.

In addition to the general inverse relationship between stress and optimal mental health, the use of particular coping styles (specifically, frequent anger or infrequent positive appraisal) serves to exacerbate the effect of stress on high-achieving students' social-emotional well-being. Specifically, as stress increases, high-achieving students who use anger coping are more likely to experience internalizing disorders (e.g., depression, anxiety, somatic complaints). This suggests that blaming and saying mean things to others are not effective strategies to deal with increasing stress among students in an academically rigorous program. This is consistent with the findings of Tolan et al. (2002), who linked emotion-focused coping strategies with psychopathology in a sample of inner-city youth; the current study supports the notion that the use of anger coping may be correlated with diminished social-emotional functioning for all adolescents, regardless of their academic achievements.

The use of adaptive coping strategies, such as positive appraisal coping, may serve to buffer the impact stress has on positive indicators of mental health, namely, life satisfaction. Consistent with the findings of McKnight et al. (2002), stress was associated with decreased life satisfaction among high-achieving students. Interestingly, high-achieving students who reported using fewer positive appraisal coping behaviors (e.g., thinking about the good things in life) showed sharper declines in life satisfaction as perceived stress increased compared to students who reported using this coping strategy more frequently. Thus, the detrimental impact of stress on life satisfaction was more exaggerated for students who engaged in relatively few positive appraisal and help-seeking behaviors. In contrast, those students who thought positively (e.g., try to see the good things in a difficult situation) or solicited social support (e.g., try to keep up friendships or make new friends) were less affected by stress, suggesting that the use of positive appraisal coping serves to partially buffer the impact of stress on subjective well-being.

This study was one of the first to systematically examine stress, coping, and mental health outcomes in a high-achieving and academically advanced group of students. Findings warrant replication due to several important limitations. First, these results are specific to a relatively small convenience sample of students in a single school in a rural community; students who attend this school may not be representative of students who attend all IB programs in America. Given the particularly low participation rate among students in the general education curriculum, it is also plausible that the results do not reflect the stress and coping of all general education students. Second, a few natural disasters (i.e., hurricanes) affected the area in which students in this study lived during the semester in which the data for this study were collected. Notably, residents of this state are rather accustomed to threats of hurricanes, and the researchers allowed approximately 5 weeks between the last hurricane and data collection in an effort to minimize the effects of the hurricanes on the mental health of students. Coupled with the fact that there is no reason to believe that students in the general education and IB curricula were not equally affected by the hurricanes, it is reasonable to attribute any differences found between the groups to real group differences rather than effects of the natural disasters. However, findings may be unique to this particular geographic location at a sensitive point in time.

Other limitations of this study that can be addressed in future research using improved methodology include the cross-sectional design of the study; a longitudinal research design may more effectively isolate the impact of continued exposure to rigorous curricula on perceived stress. Second, future research should seek to control for pre-existing group differences, such as cognitive functioning, in addition to personality, valuing of school, need for achievement, socioeconomic status, parent support, and other variables that may be impacting academic achievement and social-emotional functioning in order to isolate the effect of curriculum on stress. Third, although the use of a subjective measure of stress is a considerable strength in evaluating the impact of stressful life events on adolescents, it is unclear without an objective measure (e.g., a stressful life events checklist) to what the perceptions of stress can be attributed. Future research should use both a subjective and an objective measure of stress to determine both the impact and sources (e.g., school, peers, family) of stress. Finally, this study focused exclusively on coping as individual attributes; future research should also examine the role of external social support systems.

Implications of findings in this study are manifold. Although this pilot study found that participation in a particularly academically demanding curriculum is associated with increased perceptions of stress, the manner in which students cope with this stress appears related to their emotional well-being. As stress increases, students should be discouraged from adopting an external locus of control (i.e., blaming others, yelling at others) in order to minimize internalizing forms of psychopathology. Teachers, administrators, and support staff (e.g., guidance counselors, school psychologists) working with high-achieving students who witness students using anger coping to deal with stress should intervene and encourage the use of more adaptive coping strategies. It is also important to note that as stress increases, life satisfaction decreases linearly. It may be beneficial to teach students to address imminent stress with adaptive coping strategies, such as thinking positively and maintaining close friendships. Educators who work with high-achieving students should encourage students to think positively and encourage activities that help students build relationships with their peers.

The findings of this study also underscore the social-emotional benefit of turning to one's family to cope with stress. Specifically, students who coped by communicating with and relying on family members had fewer mental health problems. Involving parents and siblings in the education of students in advanced curricula may increase the overall well-being of students in such programs. Home-school communication methods that inform parents of upcoming stressful events (e.g., testing, large homework assignments) may benefit students by preparing families to be more available to their adolescents during highly stressful times. Educators should encourage students to communicate with their parents in times of stress, which may be counterintuitive to adolescents who may have easier access to peers.

In sum, participation in increasingly popular college preparatory programs during high school may not be risk free given the higher levels of stress these students perceive. In the case of high-achieving youth, however, stress is not necessarily linked with diminished academic and social-emotional functioning; the ways in which students cope with the stress is key. Specifically, teaching students to use positive coping strategies more frequently and expressions of anger less often may help buffer the negative impact of stress on mental health outcomes.

## References

Achenbach, T. M., & Rescorla, L. A. (2001). Manual for the ASEBA school-age forms and profiles. Burlington: University of Vermont, Research Center for Children, Youth, and Families.

Alva, S. A., & de Los Reyes, R. (1999). Psychosocial stress, internalized symptoms, and the academic achievement of Hispanic adolescents. Journal of Adolescent Research, 14, 343–358.

Band, E. B., & Weisz, J. R. (1988). How to feel better when it feels bad: Children's perspectives on coping with everyday stress. Developmental Psychopathology, 24, 247–253.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. Journal of Personality and Social Psychology, 51, 1173–1182.

Carter, J. C., Garber, J., Ciesla, J. A., & Cole, D. A. (2006). Modeling relations between hassles and internalizing and externalizing symptoms in adolescents: A four-year prospective study. Journal of Abnormal Psychology, 115, 428–442.

Centers for Disease Control and Prevention. (2004, May 21). Youth risk behavior surveillance—United States, 2003. Morbidity and Mortality Weekly Report, 53(SS-2). Retrieved November 23, 2007, from http://www.cdc.gov/mmwr/PDF/SS/SS5302.pdf

Chassin, L., Ritter, J., Trim R. S., & King, K. M. (2003). Adolescent substance use disorders. In E. J. Mash & R. A. Barkley (Eds.), Child psychopathology (2nd ed., pp. 199–230). New York: Guilford Press.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 385–396.

Compas, B. E., Connor-Smith, J. K., Saltzman, H., Thomsen, A. H., & Wadsworth, M. E. (2001). Coping with stress during childhood and adolescence: Problems, progress and potential in theory and research. Psychological Bulletin, 127, 87–127.

Compas, B. E., Orosan, P. G., & Grant, K. E. (1993). Adolescent stress and coping: implications for psychopathology during adolescence. Journal of Adolescence, 16, 331–349.

Copeland, E., & Hess, R. (1995). Differences in young adolescents' coping strategies based on gender and ethnicity. Journal of Early Adolescence, 15, 203–219.

Cunningham, M., Hurley, M., Foney, D., & Hayes, D. (2002). Influence of perceived contextual stress on self-esteem and academic outcomes in African American adolescents. Journal of Black Psychology, 28, 215–233.

de Anda, D., Baroni, S., Boskin, L., Buchwald, L., Morgan, J., Ow, J., et al. (2000). Stress, stressors and coping among high school students. Children and Youth Services Review, 22, 441–463.

Evans, G. W., Bullinger, M., & Hygge, S. (1998). Chronic noise exposure and physiological response: A prospective study of children living under environmental stress. Psychological Science, 9, 75–77.

Fanshawe, J. P., & Burnett, P. C. (1991). Assessing school-related stressors and coping mechanisms in adolescents. British Journal of Educational Psychology, 61, 92–98.

Galaif, E., Sussman, S., Chou, C. P., & Wills, T. (2003). Longitudinal relations among depression, stress and coping in high risk youth. Journal of Youth and Adolescence, 32, 243–258.

Gillock, K. L., & Reyes, O. (1999). Stress, support, and academic performance of urban, low-income, Mexican-American adolescents. Journal of Youth & Adolescence, 28, 259–281.

Golden-Kreutz, D. M., Browne, M. W., Frierson, G. M., & Anderson, B. L. (2004). Assessing stress in cancer patients: A second-order factor analysis for the Perceived Stress Scale. Assessment, 11, 216–223.

Gonzales, N., Tein, J. Y., Sandler, I. N., & Friedman, R. J. (2001). On the limits of coping: Interaction between stress and coping for inner-city adolescents. Journal of Adolescent Research, 16, 372–395.

Grant, K. E., Compas, B. E., Stuhlmacher, A. F., Thurm, A. E., McMahon, S. D., & Halpert, J. A. (2003). Stressors and child and adolescent psychopathology: Moving from markers to mechanisms of risk. Psychological Bulletin, 129, 447–466.

Hess, R. S., & Copeland, E. P. (2006). Stress. In G. Bear & K. Minke (Eds.), Children's needs III: Development, prevention, and correction (pp. 255–265). Bethesda, MD: National Association of School Psychologists.

Howard, M. S., & Medway, F. J. (2004). Adolescents' attachment and coping with stress. Psychology in the Schools, 41, 391–402.

Huebner, E. S. (1991). Correlates of life satisfaction in children. School Psychology Quarterly, 6, 103–111.

Huebner, E. S., Funk, B., & Gilman, R. (2000). Cross-sectional and longitudinal psychosocial correlates of adolescent life satisfaction reports. Canadian Journal of School Psychology, 16, 53–64.

International Baccalaureate Organization. (2005). Education for life. Retrieved June 1, 2006, from http://www.ibo.org

Jahoda, M. (1958). Current concepts of positive mental health. New York: Basic Books.

Jaser, S. S., Langrock, A. M., Keller, G., Merchant, M. J., Benson, M. A., Reeslund, K., et al. (2005). Coping with the stress of parental depression II: Adolescent and parent reports of coping and adjustment. Journal of Clinical Child and Adolescent Psychology, 34, 193–205.

Kantrowitz, B., & Wingert, P. (2006). What makes a high school great? Newsweek, May 8. p. 50–52, 56, 58–60.

Kouzma, N. M., & Kennedy, G. A. (2002). Homework, stress, and mood disturbance in senior high school students. Psychological Reports, 91, 193–198.

Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal, and coping. New York: Springer.

Little, S., & Garber, J. (2004). Interpersonal and achievement orientations and specific stressors predict depressive and aggressive symptoms. Journal of Adolescent Research, 19, 63–84.

Loeber, R., & Farrington, D. P. (2000). Young children who commit crime: Epidemiology, developmental origins, risk factors, early interventions, and policy implications. Development and Psychopathology, 12, 737–762.

Martin, R. A., Kazarian, S. S., & Breiter, H. J. (1995). Perceived stress, life events, dysfunctional attitudes, and depression in adolescent psychiatric inpatients. Journal of Psychopathology & Behavioral Assessment, 17, 81–95.

Mason, J. W. (1975). A historical view of the stress field. Journal of Human Stress, 1, 6–27.

Mates, D., & Allison, K. R. (1992). Sources of stress and coping responses of high school students. Adolescence, 27, 461–474.

Mayberry, D. J., & Graham, D. (2001). Hassles and uplifts: Including interpersonal events. Stress and Health, 17, 91–104.

McKnight, C. G., Huebner, E. S., & Suldo, S. (2002). Relationships among stressful life events, temperament, problem behavior, and global life satisfaction in adolescents. Psychology in the Schools, 39, 677–687.

McNamara, S. (2000). Stress in young people: What's new and what can we do? New York: Continuum.

Moore, K. A., & Lippman, L. H. (2005). What to children need to flourish: Conceptualizing and measuring indicators of positive development. New York: Springer.

Muris, P. (2001). A brief questionnaire for measuring self-efficacy in youths. Journal of Psychopathology and Behavioral Assessment, 23, 145–149.

Muris, P. (2002). Relationships between self-efficacy and symptoms of anxiety disorders and depression in a normal adolescent sample. Personality and Individual Differences, 32, 337–348.

Patterson, J. M., & McCubbin, H. I. (1987). Adolescent coping style and behaviors: Conceptualization and measurement. Journal of Adolescence, 10, 163–186.

Preuss, L. J., & Dubow, E. F. (2004). A comparison between intellectually gifted and typical children in their coping responses to a school and a peer stressor. Roeper Review, 26, 105–111.

Roeser, R. W., Eccles, J. S., & Sameroff, A. J. (2000). School as a context of early adolescents' academic and social-emotional development: A summary of research findings. The Elementary School Journal, 100, 443–471.

Schmeelk-Cone, K. H., & Zimmerman, M. A. (2003). A longitudinal analysis of stress in African American youth: Predictors and outcomes of stress trajectories. Journal of Youth and Adolescence, 32, 419–430.

Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction.

American Psychologist, 55, 5–14.

Selye, H. (1993). History of the stress concept. In L. Goldberger & S. Breznitz (Eds.), Handbook of stress: Theoretical and clinical aspects (2nd ed., pp. 7–17). New York: Free Press.

Shaunessy, E., Suldo, S. M., Hardesty, R. B., & Shaffer, E. S. (2006). School functioning and psychological well-being of International Baccalaureate and general education students: A preliminary examination. Journal of Secondary Gifted Education, 17, 76–89.

Stein, M., & Miller, A. H. (1993). Stress, the immune system, and health and illness. In L. Goldberger & S. Breznitz (Eds.), Handbook of stress: Theoretical and clinical aspects. (pp. 127–141). New York: Free Press.

Tolan, P. H., Gorman-Smith, D., Henry, D., Chung, K. S., & Hunt, M. (2002). The relation of patterns of coping of inner-city youth to psychopathology symptoms. Journal of Research on Adolescence, 12, 423–449.

U.S. Department of Health and Human Services. (1999). Mental health: A report of the Surgeon General. Rockville, MD: U.S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Mental Health Services, National Institutes of Health, National Institute of Mental Health. Retrieved November 23, 2007, from http://www.surgeongeneral.gov/library/mentalhealth/pdfs/front.pdf

Zullig, K. J., Valois, R. F., Huebner, E. S., Oeltmann, J. E., & Drane, J. W. (2001). Relationship between perceived life satisfaction and adolescents' substance abuse. Journal of Adolescent Health, 29, 279–288.