SOURCES OF STRESS FOR STUDENTS IN HIGH SCHOOL COLLEGE PREPARATORY AND GENERAL EDUCATION PROGRAMS: GROUP DIFFERENCES AND ASSOCIATIONS WITH ADJUSTMENT

Shannon M. Suldo, Elizabeth Shaunessy, Amanda Thalji, Jessica Michalowski, and Emily Shaffer

ABSTRACT

Navigating puberty while developing independent living skills may render adolescents particularly vulnerable to stress, which may ultimately contribute to mental health problems (Compas, Orosan, & Grant, 1993; Elgar, Arlett, & Groves, 2003). The academic transition to high school presents additional challenges as youth are required to interact with a new and larger peer group and manage greater academic expectations. For students enrolled in academically rigorous college preparatory programs, such as the International Baccalaureate (IB) program, the amount of stress perceived may be greater than typical (Suldo, Shaunessy, & Hardesty, 2008). This study investigated the environmental stressors and psychological adjustment of 162 students participating in the IB program and a comparison sample of 157 students in general education. Factor analysis indicated students experience 7 primary categories of stressors, which were examined in relation to students' adjustment specific to academic and psychological functioning. The primary source of stress experienced by IB students was related to academic requirements. In contrast, students in the general education program indicated higher levels of stressors associated with parent-child relations, academic struggles, conflict within family, and peer relations, as well as role transitions and societal problems. Comparisons of correlations between categories of stressors and students' adjustment by curriculum group reveal that students in the IB program reported more symptoms of psychopathology and reduced academic functioning as they expe-

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rienced higher levels of stress, particularly stressors associated with academic requirements, transitions and societal problems, academic struggles, and extra-curricular activities. Applied implications stem from findings suggesting that students in college preparatory programs are more likely to (a) experience elevated stress related to academic demands as opposed to more typical adolescent concerns, and (b) manifest worse outcomes in the face of stress.

Early adolescence is considered a tumultuous developmental period due to the psychological, social, and physical changes that adolescents experience as they go through puberty and increase independent living skills (Steinberg & Sheffield Morris, 2001). The transition to high school requires them to interact with a new and larger peer group and manage greater academic expectations. For students enrolled in rigorous academic programs, such as the International Baccalaureate (IB) High School Diploma Program, the amount of stress perceived during adolescence may be even greater compared to that of students enrolled in general education programs (Suldo, Shaunessy, & Hardesty, 2008). What is unknown is (a) the particular environmental stressors experienced at a greater level by IB students, and (b) the extent to which elevated experiences of stressors are related to diminished functioning. This study intends to identify IB students' primary sources of stress and specific categories of stressors that may be particularly related to adjustment.

Relationship between Stress and Psychological Adjustment During Adolescence

During the adolescent period children may be particularly vulnerable to stress, especially when exacerbated by the use of ineffective coping strategies, which may ultimately result in mental health problems (Compas, Orosan, & Grant, 1993; Edgar, Arlett, & Groves, 2003). Stress has been explained from a variety of frameworks, including medical, psychological, and environmental models (McNamara, 2000). The medical model defines stress as an individual's state of distress in response to an environmental factor that threatens homeostasis. Increased heart rate, elevated blood pressure, and the presence of hormones and neurotransmitters within the body are associated as physiological responses to stress (Goldstein & Kopin, 2007). The psychological model offers a transactional or ecological view, which includes interactions between environmental stressors, one's cognitive appraisal of stressors, and internal physiological responses to events. The environmental model focuses exclusively on the first of these three components; this model describes stress as external to an organism, and includes threats of immediate harm or aversive environmental condi-

tions. Checklists of events associated with putting strain on the individual (i.e., stress inventories) assess this type of stress.

Specific environments, such as rigorous college preparatory high school academic programs, may be perceived as particularly stressful. One increasingly popular college preparatory curriculum is the International Baccalaureate (IB) Diploma Program, which is currently established in approximately 2,217 schools in 125 countries (International Baccalaureate Organization, 2008). Throughout high school, students enrolled in the IB curriculum are engaged in community service, research, and challenging courses. Research comparing students in IB programs to students in general education programs identified differences in mean levels of stress between these groups, such that students in IB reported higher levels of perceived stress (i.e., psychological stress) compared to students in the general education curriculum (Suldo et al., 2008). One purpose of the current study is to determine the specific stressors that IB students experience at a higher level than typical high school students.

Sources of Stress in High School

Adolescents experience normative stressors, non-normative stressors, and daily hassles as sources of stress. Normative stressors include developmental challenges of adolescence, including puberty, school transition, and increased academic pressure (Isakson & Jarvis, 1999). Non-normative stressful life events include divorce and deaths. Lastly, daily hassles include minor events that are chronic, such as parent-child conflict and academic requirements (Sim, 2000), that when accumulated, are strong predictors of poor psychological outcomes (Compas, 1987). Recent research by Byrne, Davenport, and Masanov (2007) yielded ten dimensions (categories) of stressors that were derived from factor analysis of 58 distinct stressors (items) identified by Australian youth ages 13–18. Four of the categories related to schooling; other categories reflected stressors associated with interpersonal relationships, home life, financial pressures, uncertainty about the future, and the presence of emerging adult responsibility.

Academic stressors. High school students cite day-to-day stresses of school (e.g., tests, grades, homework, academic and achievement expectations) among their greatest stressors (Crystal et al., 1994; de Anda et al., 2000; Lohman & Jarvis, 2000). Types of school-related stressors include academic performance, attendance, interactions with teachers, and balancing one's leisure time with school (Byrne et al., 2007). Earlier inventories of school-related stressors indicated nine types, including inadequate instructional methods, teacher-student re-

lationships, heavy academic workload, poor physical classroom environments, and disorganization surrounding academic assignments and schedules (Burnett & Fanshawe, 1997). One specific academic stressor involves standardized testing, which is increasingly common in American schools (McNamara, 2000). This is particularly true for IB students who are required to complete end-of-course exams to obtain their IB diploma. Many times, these students also take Advanced Placement (AP) exams because some academic institutions award university-level credit for only the Higher Level (intensive, 2 year) IB course examinations (Matthews, 2004).

Relationship stressors. Although relationships have been found to influence stress by acting as a buffer against negative outcomes (Sim, 2000), they also present common sources of stress related to peer pressure, navigating romantic relationships, and navigating relationships with parents (Byrne et al., 2007). The amount of stress associated with maintaining close relationships was underscored by research in which adolescents listed and then ranked up to 10 of their most significant stressors; problems with family and peer relationships were reported by 67–87% of boys and girls (Lohman & Jarvis, 2000). In a study of Canadian high school students, two of the three categories of stressors mentioned by students from all types of academic tracks involved stress associated with family and friends (Mates & Allison, 1992).

Adolescent transition stressors. Adolescence is characterized by unique transitions into roles and responsibilities created by changes during puberty and adjustments created by institutions (e.g., school, work place; Halpern-Felsher, Millstein, & Irwin, 2002). Stressors in this transitional period include pressure to earn money; interferences between work, school, and social activities; and concern about the future (Byrne et al., 2007; Mates & Allison, 1992). Regarding employment, stress arises as adolescents seek work in occupations that are not aligned with school curriculum or future career aspirations (National Research Council, 1998), and stems from exposure to negative aspects of work settings (i.e., poor environmental conditions, impersonal work setting, constraints on autonomy) which increases the risk of youth substance use (Lohman & Jarvis, 2000; McCrystal, Percy, & Higgins, 2007). As competition for university acceptance increases, college-bound adolescents' concerns may be compounded by pressure to produce high scores on standardized tests.

Particular Stressors for Groups of Adolescents

Research has identified stressors unique to particular groups of youth, such as those who are from urban environments, ethnic minority backgrounds, or intellectually gifted. For instance, adolescents in urban environments experience unique stressors such as harassment (followed by police, pressure to sell or carry drugs), safety concerns, and pressure to engage in risky and/or violent behaviors (Bennett & Miller, 2006). Minority adolescents' high risk for school failure is associated with their increased exposure to the stressors related to low socioeconomic status, which is typically marked by residency in communities that lack resources and are characterized by poverty, unemployment, racism, family disruption, and violence (Gillock & Reyes, 1999).

Another group of students with unique stressors are those identified as intellectually gifted, who experience rapid development of intellect which differentiates them from their non-gifted peers. For instance, gifted children are precocious in terms of their cognitive abilities to appraise situations as well as in their use of problem-focused coping strategies; early development in such areas can support or hinder these students' fit into their environments and/or coping skills (Preuss & Dubow, 2004; Sowa et al., 1994). Gifted students report particular stressors related to social stigma associated with the gifted label, pressure from others to be perfect, and feeling misunderstood by peers (Manor-Bullock, Look, & Dixon, 1995; Preuss & Dubow, 2004).

Lastly, elite college-preparatory programs, such as the IB Diploma Program, may be associated with their own unique stressors. Specifically, the IB program tends to involve not only challenging academic curricula, but also creates extremely competitive situations for students and demands large amounts of time spent out of school doing homework, developing projects, engaging in research, studying for exams, and participating in community service (Taylor, Pogrebin, & Dodge, 2002). The requirements for IB exceed those for typical high school graduation. During interviews, IB students reported perceiving that the amount of time needed to complete requirements of advanced courses surpassed the number of available study hours (Taylor et al., 2002). Furthermore, Taylor et al. (2002) propose that these programs cause students to experience a highly stressful lifestyle due to time constraints, and falling behind in assignments becomes an overwhelming experience. Although preliminary research has found an overall higher level of stress among students in IB (Suldo et al., 2008), the specific sources of this stress (i.e., stressors) have not yet been empirically examined. Thus, it is plausible but unknown if the particular

stressors most often experienced by youth in IB are indeed related to academic demands, or areas such as peer or family relationships, which may also be strained in part due to reduced time and/or mental energy to invest in such relationships. The potential for IB students to experience distinct stressors is suggested by a preliminary study with 10th-grade students in three academic tracks in Canada, which found that students in the two most academically oriented tracks (advanced and general) report unique sources of stress (i.e., stress associated with school and sports) compared to students in the basic track, whose unique source of stress pertained to problems with gangs and drugs (Mates & Allison, 1992).

Associations between Environmental Stressors and Psychological Functioning

Research has identified significant associations between mental health problems and specific stressors among youth. For instance, stressors related to parents' marital conflict and divorce predict both externalizing and internalizing forms of psychopathology (McMahon, Grant, Compas, Thrum, & Ey, 2003). Stressors associated with interpersonal relations (e.g., peer pressure, romantic relationships, relationships with parents) are related to more symptoms of anxiety and depression, and negatively correlated with self-esteem (Byrne et al., 2007). Byrne et al. also identified significant, moderate correlations between anxiety symptoms and adolescents' stress associated with academic demands (e.g., stress related to school performance, attendance, interactions with teachers). Interestingly, despite extraordinary academic demands and higher levels of overall perceived stress (Suldo et al., 2008), students in IB do not appear to experience impairments in academic or psychological functioning (Shaunessy, Suldo, Hardesty, & Shaffer, 2006), which have co-occurred with high stress in other unique secondary school populations, including ethnic minority and at-risk youth (Cunningham et al., 2002; Gillock & Ryes, 1999).

Purpose of the Current Study

The present study examined the sources of stress of students who participate in IB as well as general education, and determined which of these environmental stressors were experienced at an elevated level by students in the IB program. Additionally, this study assessed the relationship between different types of stressors and students' adjustment. This was done in part to explore if IB students are relatively resistant to the negative impact of stress, which may explain why, compared to their peers in general education, their overall perceptions

of stress are high (Suldo et al., 2008) although their psychosocial functioning is comparable or superior (Shaunessy et al., 2006). A comprehensive framework of mental health, in which the absence of illness does not conclude the presence of health, was employed. Students' psychological functioning was assessed using both positive indicators that gauge the full range of functioning from low to thriving (specifically, life satisfaction) as well as more traditional indicators of psychopathology (i.e., internalizing and externalizing psychopathology). In line with Roeser, Eccles, and Sameroff's (2000) conceptualization of adolescent psychosocial functioning with respect to schooling as including academic achievement, students' grades and attendance were also examined in relation to stress.

METHOD

Participants

The current study is part of a larger longitudinal investigation of academic and social-emotional functioning of students in different curricula (Shaunessy et al., 2006; Suldo, Shaunessy, Michalowski, & Shaffer, 2008). All participants attended one high school in a rural southeastern state. This school was selected because it contained an IB program as well as a general education program in the same school building. There was a separate principal and administrative staff for each school, but students shared facilities as well as faculty. Students in both programs are expected to meet the curricular requirements set forth by their state that are necessary for graduation, but students in the IB program must also complete the IBO requirements (see www.ibo.org/diploma).

Data from two waves of data collection were analyzed in the current study. In the fall of 2005 (Time 1 of the current study), 48 students in the IB program and 23 students from general education participated in 12 focus groups. Demographic characteristics (gender, socioeconomic status, ethnicity, grade level) of participants are presented by curriculum group in Table 1. Socioeconomic status (SES) was indexed by one self-report item to which students reported whether they qualified for free or reduced-price school lunch. In the winter of 2005 (Time 2 of the current study), 319 students (162 from the IB program and 157 from general education) completed a battery of self-report measures, including a sources of stress inventory that included 63 stressors mentioned by students during the focus groups. Participants were 13 to 20 years old (M = 16.06, SD = 1.14). Additional demographic characteristics

Table 1

Descriptive Characteristics of Participants in the International Baccalaureate (IB) and General Education (GE) Programs at Each Time Point

	Time 1			Time 2		
	IB ($n = 48$)	GE ($n = 23$)	Total ($N = 71$)	IB ($n = 162$)	GE ($n = 157$)	Total ($N = 319$)
Demographic variable	%	%	%	%	%	%
Gender						
Male	33.33	30.43	32.39	32.72	28.66	30.72
Female	66.67	69.57	67.61	67.28	71.34	69.28
Grade						
9	N/A	N/A	N/A	39.51	23.57	31.66
10	45.83	56.52	49.30	27.78	35.03	31.35
11	31.25	21.74	28.17	18.52	31.85	25.08
12	22.92	21.74	22.54	14.20	9.55	11.91
Ethnicity						
Caucasian	77.08	78.26	77.46	69.14	64.33	66.77
African-American	2.08	13.04	5.63	2.47	18.47	10.34
Asian	6.25	0	4.23	12.35	2.55	7.52
Hispanic/Latino	6.25	0	4.23	10.49	11.46	10.97
Native American	0	0	0	0	0.64	0.31
Other	8.33	8.70	8.45	5.56	2.55	4.08
Socioeconomic status						
Low	6.25	13.04	8.45	8.64	33.33	20.75
Average/High	93.75	86.96	91.55	91.36	67.67	79.25

are included in Table 1. Of the 319 participants, 211 in grades 10-12 (97% of the sample) participated in an earlier wave of data collection (Shaunessy et al., 2006). The 101 students in 9th grade and seven students in grades 10–12 joined the study at Time 2.

Procedures

Active consent for all student participants was secured via a letter from the research team explaining the study and requesting written parent permission for students' participation; the letter was sent home to parents of all students in the high school. Written assent was also secured from all students who had active parent consent to participate. Although students were not paid for participation, several gift certificates to the local mall were provided to participants selected at random at the conclusion of each wave of data collection.

At Time 1, students participated in 12 focus groups (four groups consisting of students in general education, 8 groups consisting of students in the IB program). One moderator facilitated each 45- to 75-minute focus group while another member of the research team managed an audio recorder and took field notes. The moderator explained the purpose of the meeting, underscored the voluntary nature of the discussion, then posed the question "what particular kinds of situations or difficulties have led you to feeling stress recently?" The moderator used active listening skills (e.g., verbal attending, summarizing, paraphrasing) to encourage elaboration and ensure clarity. Five members of the research team reviewed the audiofiles and field notes, then generated written lists of themes (i.e., specific stressors) reported by participants. Researchers compared the identified themes and retained the specific stressors that emerged in more than one focus group.

At Time 2, students completed the measures described below and a brief demographic questionnaire in groups of approximately 50–100. 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.

Measures

The Youth Self Report Form of the Achenbach System of Empirically Based Assessment (YSR; Achenbach & Rescorla, 2001). The YSR is a 112-item questionnaire that assesses eight areas of problem behavior and was designed for use with adolescents ages 11 to 18. Items are presented using a 3-point scale from 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 six months). In this study, only the internalizing and externalizing composite scores were analyzed. 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. Regarding validity,

all items on the YSR discriminate between clinical populations of adolescents and nonreferred samples (Achenbach & Rescorla, 2001). Test-retest reliability at 8-days obtained coefficient alphas ranging from .80 to .90. Internal consistency reliability was high in the current study, with Cronbach's alpha at .90 and .89 for the internalizing and externalizing composites, respectively.

Students' Life Satisfaction Scale (SLSS; Huebner, 1991). The SLSS consists of seven items assessing global life satisfaction in children. Respondents indicate on a likert scale, from 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, then summing the responses and dividing by seven. Higher scores represent higher levels of life satisfaction. Multiple studies with school-age youth provide evidence for the reliability and validity of the SLSS (see Huebner, Gilman, & Suldo, 2007, for a review). Cronbach's alpha was .93 in the current study, indicating high reliability.

Sources of Stress Inventory (SOSI). The SOSI was created by several authors of the current manuscript based on student responses in Time 1. Specifically, the 63 items in the SOSI represent distinct stressors described by at least 2 participants in the focus groups. The SOSI required respondents to rate how stressful each situation/item has been for them in the past month using the following metric: 1 (*not at all stressful* or *has not occurred*), 2 (*a little stressful*), 3 (*moderately stressful*), 4 (*quite stressful*), and 5 (*very stressful*). Prior to inclusion in the current study, an initial version of the SOSI was pilot tested with a convenience sample of high school students who provided feedback regarding the clarity, readability, and redundancy of items. Psychometric properties (number of factors, internal consistency of each) for the final version of the SOSI administered in the current study are presented later in this paper.

Grade point average (GPA). Cumulative 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. Some GPA values exceed 4.0 because the school provides additional credit for difficult coursework. 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). Zero points were always awarded for grades of F.

Attendance. School records provided the hours of school students missed in the academic year in which self-report data were collected. Higher scores indicate poorer school attendance.

RESULTS

Sources of Stress

The SOSI was subjected to an exploratory factor analysis (principal components with oblique rotation) conducted with SAS 9.1. The scree plot and eigenvalues suggested an eight-factor solution that accounted for 82% of the variance; all eigenvalues exceeded 1.0. However, only seven factors were retained because the eighth factor consisted of only 2 items. This seven-factor solution accounted for 79% of the variance. Correlations between factors were positive in direction, and small to moderate in magnitude (range = .12 to .45).

The majority of items (48 of 63) loaded adequately (i.e., > .35) on only one of the seven factors and fit conceptually with other items within the same factor. Factor loadings yielded from the rotated factor pattern matrix for each of these 48 items are shown in Table 2. Of the remaining 15 items originally included on the SOSI, 2 loaded on the excluded eighth factor, 2 loaded substantially on two factors (i.e., were not pure indicators of a factor), 1 loaded sufficiently on a factor (loading = .37) but did not fit conceptually, and 10 items did not load adequately on any of the factors. In sum, the EFA suggested a seven-factor solution in which 48 items were relatively pure indicators of the constructs. This 48-item solution was retained for the remaining analyses. Internal consistencies for the subscales ranged from excellent (.92 for academic requirements) to at the lower bound of acceptability for exploratory research purposes (.65 for academic struggles); exact values are included in Table 2.

Factor I (15 items) consists of stressors related to completing academic requirements, including (a) completion of discrete assignments (e.g., homework, large exams, school projects), (b) time management relevant to managing numerous academic demands, and (c) meeting high self-, peer- and teacher-imposed expectations for superior academic performance. Factor II (8 items) consists of stressors related to parent-child relations, primarily (a) conflicts with parents and (b) time management relevant to managing responsibilities at home and elsewhere. Factor III (7 items) consists of stressors that pertain to life changes that are particularly salient during the developmental period of adolescence, including (a) securing gainful employment, (b) transi-

Table 2

Factor Structure of the SOSI Obtained via Exploratory Factor Analysis

#	Item content	Factor I.	II.	III.	IV.	V.	VI.	VII.
9	Amount of homework (e.g., reading, projects, papers)	87*	-2	-5	-11	-7	-3	4
8	Multiple tests and/or assignments due on same day	80*	-3	1	-7	2	1	6
24	Not enough time (e.g., to complete homework, to do extracurricular activities, to spend with family, for self, etc.)	73*	-1	5	-17	4	9	8
3	Large school projects (e.g., portfolios, extended essay)	73*	6	-11	2	-6	-5	-3
62	Own expectations or achievement and/or behavior	70*	5	-11	-4	6	2	9
54	Obsessing over things that need to be done for school	70*	0	0	6	-2	-10	20
36	Not enough free time or down time	64*	19	1	-5	-2	2	-1
43	Lack of sleep; tired, fatigue	63*	-7	-5	5	18	12	4
13	Getting/keeping high grades (GPA)	62*	8	-3	12	-2	-1	8
15	Competition within class/school (e.g., class rank)	50*	11	-1	18	-10	15	-10
29	School schedule (A, B, & C days, preparing for Fridays)	45*	-7	4	14	-10	16	0
30	Pressure to do well on FCAT, PSAT, ACT, AP Exams, IB Exams, etc.	44*	-16	40	12	2	4	-16
32	Community service requirements	43*	-3	20	20	-14	-7	-4
18	Teachers' expectations for achievement and/or behavior	40*	24	20	10	-7	-9	1
40	Being overcommitted (e.g., scheduled to be at two places at one time)	38*	-4	3	-9	17	33	14
35	Parents' rules and control at home (lack of freedom)	2	72*	16	-1	-1	-4	-11
25	Parents hassling and nagging	4	71*	-7	0	5	-2	19
27	Lack of understanding by parents	4	68*	-3	-2	15	-8	15
2	Parents' expectations for achievement and/or behavior	17	62*	-5	2	-12	4	7
4	Disagreements between you and your parents	0	60*	-1	-4	32	-3	-10
38	Too many responsibilities at home (e.g., chores, caring for siblings)	9	42*	17	10	10	6	-12
5	Balancing school with family	23	38*	7	-4	24	3	-18
22	Parents monitoring grades (online grading system)	-3	37*	12	17	-17	0	25

28	Balancing school with work/job	-6	17	57*	-18	-14	20	16
34	Hurricanes with local impact	0	2	55*	4	25	-6	-1
21	Getting/keeping a job	-11	13	53*	-6	-4	3	22
37	Illness or death in family	-7	7	44*	-3	24	-6	13
49	Preparing for college (e.g., completing applications, making decisions)	32	1	42*	11	6	-13	-8
48	Violence at school (e.g., gangs, rumors of guns)	-3	5	39*	12	14	-1	9
60	Problems in society (e.g., war, high gas prices, natural disasters)	18	-14	39*	4	35	-9	3
11	Problems with friends or classmates (e.g., rumors, lies, gossip about you)	-5	-2	13	67*	-9	-3	17
12	Fitting in with all students at school	11	-6	-2	66*	-3	-8	-4
53	Problems with friendships (e.g., friends complain, not enough time for friends, loneliness)	2	-1	6	61*	-4	-10	30
7	Pressure from peers to do risky behaviors (e.g., drinking, drugs, sex)	-11	23	0	47*	2	8	4
31	Social events (homecoming)	11	3	-15	44*	25	25	1
51	Problems with appearance (e.g., weight, skin)	22	0	-7	40*	17	-16	21
57	Problems in romantic relationships (e.g., arguments with boy/girlfriend)	-10	-1	2	36*	9	18	31
59	Divorce (e.g., living in multiple houses, dealing with step-parents)	-15	5	18	-20	64*	-2	9
61	Parents are unavailable due to work schedules	13	-5	-1	5	58*	-6	7
33	Arguments between parents (e.g., mom and dad fight with each other)	-7	25	7	2	56*	-1	2
47	Performance of your after-school sports team	-11	-5	7	3	-4	79*	5
16	Pressure to do well in sports	0	3	-6	3	-2	76*	0
44	Out late for sports or other extra-curricular activities	28	-5	8	-9	-5	67*	4
19	Balancing school with extracurricular activities (e.g., sports, band, clubs)	31	3	4	-4	1	61*	-5
52	Poor study skills	22	4	5	10	5	0	43*
55	Problems with health (e.g., illness, sports injury)	7	0	19	8	5	6	42*
58	Having to learn things you consider useless or are not interested in	25	3	-5	10	7	8	38*
45	Poor relationships with teachers (e.g., teachers yell, accuse)	-6	-4	29	5	6	16	37*
	Eigenvalue	15.61	3.94	2.36	1.62	1.45	1.17	1.16
	Internal consistency (coefficient alpha)	.92	.86	.77	.81	.69	.83	.65

*Factor loadings >.35

tions (e.g., preparing for college, loss of family members), (c) awareness of systemic problems in one's larger environment (e.g., school, society), and (d) community-specific stressful events, namely hurricanes. Factor IV (7 items) consists of stressors related to peer relations, including (a) conflicts with classmates/friends and romantic partners, (b) insecurities related to fitting in, and (c) peer pressure. Factor V (3 items) consists of stressors related to problems within the family, including (a) the ramifications of parental divorce, (b) conflict between parents, and (c) parental absence from the home. Factor VI (4 items) consists of stressors related to participating in extra-curricular activities, including (a) worries related to performing well at athletics, and (b) time management relevant to managing demands of extra-curricular activities with other responsibilities (e.g., school) and needs (e.g., sleep). Last, factor VII (4 items) consists of stressors related to academic struggles, including (a) poor study skills, (b) disengagement from learning (e.g., due to disinterest in the material or poor student-teacher relations), and (c) health problems that presumably have an adverse impact on school achievement.

Group Differences in Sources of Stress

Average scores on these seven categories of stressors are presented by curriculum group in Table 3. Examination of factor means indicated that students in both IB and general education (GE) reported academic requirements as the greatest source of stress; average ratings corresponded to the response option of "moderately stressful" ($M = 3.19$ and 2.85 for IB and GE students, respectively). The significance of the differences in group means were compared via independent samples t-tests. Students in the IB program reported higher ($p < .05$) mean scores on only one factor (stressors related to academic requirement) while students in general education reported higher scores on five factors: parent-child relations; stressful life events, peer relations, problems in family, and academic struggles. Students in the two curriculum groups reported similar scores on stressors related to participation in extra-curricular activities.

Relationships between Stressors and Students' Psychological Functioning

Correlations between the sources of stress and indicators of students' psychological functioning are presented in Table 4. To determine if stressors are differentially associated with adjustment among a specific curriculum group, Z-tests were conducted to test the significance of the differences between correlation coefficients obtained for IB and GE students.

Table 3

Mean Scores on SOSI Factors by Curriculum Group

	IB ($n = 162$)		GE ($n = 157$)	
Source of Stress	*M*	*SD*	*M*	*SD*
Academic Requirements*	3.19	0.86	2.85	0.91
Parent-Child Relations*	2.46	0.90	2.68	1.01
Stressful Adolescent Events*	1.72	0.59	2.33	0.87
Peer Relations*	1.85	0.66	2.25	0.97
Problems within Family*	1.69	0.87	2.14	1.10
Extra-curricular Activities	2.38	1.07	2.24	1.19
Academic Struggles*	2.04	0.80	2.32	0.93

Note: IB = International Baccalaureate Program; GE = General Education Program

* $p < .05$

Mental health. The vast majority of stressors were significantly correlated ($p < .05$) with positive and negative indicators of mental health. Among IB students, life satisfaction yielded a large, inverse association with stress associated with parent-child relations, and moderate, inverse associations with all other sources of stress except for extra-curricular activities. Among GE students, life satisfaction yielded moderate, inverse associations with problems in family and parent-child relations, as well as small, inverse associations with peer relations and academic struggles. The magnitude and direction of the associations between sources of stress and life satisfaction were statistically similar for IB and GE students across all comparisons ($z < \pm 1.96$).

Regarding associations between psychopathology and sources of stress, internalizing psychopathology yielded significant, inverse correlations with all sources of stress except for extra-curricular activities among both IB and GE students. All seven types of stressors were associated with increased externalizing behavior among IB students;

Table 4

Correlations between Source of Stress and Student Adjustment by Curriculum Group

	Life Satisfaction		Internalizing Psychopathology		Externalizing Psychopathology		GPA		Attendance	
Source of Stress	IB	GE	IB	GE	IB	GE	IB	GE	IB	GE
Academic Requirements	-.33*	-.13	.61*,A	.37*,A	.34*,A	.09A	.02	.23*	.18*,A	-.07A
Parent-Child Relations	-.50*	-.34*	.55*,A	.35*,A	.54*,A	.29*,A	-.13	-.07	.09	-.02
Stressful Adolescent Events	-.34*	-.14	.50*,A	.28*,A	.37*,A	.13A	-.19*,A	.07A	.19*,A	-.06A
Peer Relations	-.42*	-.29*	.57*	.45*	.53*,A	.28*,A	-.00	.00	.17*	.04
Problems within Family	-.31*	-.40*	.40*	.35*	.35*	.31*	-.16*	-.08	.23*A	.00A
Extra-Curricular Activities	-.01	.08	.14	-.01	.24*,A	-.09A	-.01	.06	.18*,A	-.05A
Academic Struggles	-.39*	-.25*	.45*	.37*	.54*,A	.29*A	-.28*,A	.02A	.23*	.05

Note: IB = International Baccalaureate Program; GE = General Education Program

A Magnitude of association between source of stress and adjustment outcome is significantly different for the two groups

* $p < .05$

among GE students, stress related to problems in family, parent-child relations, academic struggles, and peer relations was associated with increased externalizing behaviors. The magnitude and direction of the associations between sources of stress and psychopathology were similar for GE and IB students for only 5 of 14 correlations. Regarding the 9 comparisons that yielded statistically significant *z*-values, in each case correlations between stressors and psychopathology were stronger among IB students than GE students. Specifically, stress associated with academic requirements, parent-child relations, and stressful adolescent events predicted greater levels of both externalizing and internalizing psychopathology among IB students. Also, externalizing psychopathology was particularly strongly related to stressors associated with academic struggles, peer relations, and extra-curricular activities among IB students.

Academic achievement. Among IB students, school grades were inversely associated with more stress related to academic struggles, stressful adolescent events, and problems within the family. Among GE students, no stressors co-occurred with poorer grades, and higher levels of stress associated with academic requirements were associated with better grades. The magnitude and direction of the associations between sources of stress and school grades differed significantly in two instances, specifically, stressors associated with academic struggles and stressful adolescent events predict worse GPAs for IB students only. While all stressors except parent-child relations were associated with greater attendance problems among IB students, attendance was unrelated to stress among GE students. The magnitude and direction of these associations between sources of stress and attendance differed significantly with respect to four stressors: problems in family, adolescent events, extra-curricular activities, and peer relations.

DISCUSSION

The twofold purpose of the current study was to elucidate sources of stress experienced by students in different curricula, in particular to determine if students in the IB program experience unique stressors, and to analyze the relationship between type of stressor and student adjustment in terms of positive and negative indicators. Findings verified that the primary source of stress experienced by IB students was related to academic requirements, while their peers in general education indicated higher levels of stressors associated with a variety of

influences (e.g., family, peers, life events, academic struggles) in addition to moderate stress associated with academic requirements. Comparisons of correlations between categories of stressors and students' adjustment by curriculum group suggested that IB students may experience more symptoms of psychopathology and reduced academic functioning as they experience greater environmental stressors.

Regarding sources of stress, the exploratory factor analysis indicated seven sources of adolescent stress in the current study, including managing academic requirements, parent-child relations, adolescent transitions/events, peer relations, problems with family, participation in extra-curricular activities, and academic struggles. These results are consistent with earlier research that found adolescents' stressors are often associated with family, interpersonal relationships, and school (Byrne et al., 2007), particularly a heavy academic workload (Burnett & Fanshawe, 1997). Results of the current study were also unique in many ways. First, in contrast to Byrne and colleagues' findings, stressors related to financial pressures, uncertainty about the future, and adult responsibilities were not emphasized, whereas extra-curricular activities emerged as a distinct source of stress. This difference may be due to cultural influences during adolescence between Australian and North American societies. For instance, stressors related to after-school activities also emerged in Mates and Allison's (1992) study of Canadian high school students in which students in advanced and general education tracks reported pressure related to performance at sports to be a primary source of stress. Next, whereas student-teacher relationships emerged as notable sources of stress for adolescents in earlier studies (Burnett & Fanshawe, 1997; Byrne et al., 2007), only one item reflecting poor relationships with teachers (within the academic struggles domain) emerged in the current study, which may be indicative of a positive school climate in this sample. Unique characteristics of the school site may also contribute to the paucity of stressors associated with inadequate instructional methods and classroom environment, which emerged as stressors in Burnett and Fanshawe (1997).

Both IB and general education students rated academic requirements as the most pressing source of stress. This was the only stressor category in which IB students reported greater stress. The extreme salience of a single source of stress (i.e., managing academic requirements) to IB students is consistent with research with Swedish high school students which found that students in academic programs reported more stress related to managing their academic workload and meeting high academic standards than their peers in a vocational program who, in turn, perceived more stress related to psychosocial prob-

lems (e.g., complaints about their course schedule, teachers, or school climate) and problems in close relationships (Ollfors & Andersson, 2007). Both groups of students in the current study rated stress associated with extra-curricular activities at a similar level, further supporting the notion that this source of stress may be due to an overarching societal influence (vs. unique to a specific academic group).

Regarding associations between stressors and student adjustment, the current study found that elevated life satisfaction co-occurred with reduced stress in a similar manner across curriculum groups. In contrast, IB students were especially likely to exhibit psychopathology (particularly externalizing behaviors), as well as academic problems (i.e., worse grades, attendance problems) when they experienced elevated levels of stress associated with specific stressors. These findings suggest that IB students may be more sensitive to manifesting adverse effects of stress than typical high school students.

This is a surprising conclusion because students in the IB program contradict the concept that high stress typically predicts or co-occurs with poor functioning (Byrne et al., 2007; Grant, Compas, Thurm, McMahon, & Gipson, 2004). Specifically, extant studies of stress and mental health of IB students have found that despite perceiving higher levels of general stress (Suldo et al., 2008), IB students' academic functioning (i.e., perceptions of academic abilities, GPAs) exceeds that of their peers in the general education curriculum, and IB students' average social-emotional functioning (i.e., life satisfaction and psychopathology) is comparable to that of their general education peers (Shaunessy et al., 2006). This pattern may be specific to high-achieving American youth, as earlier cross-cultural research found that high-achieving American high school students (i.e., top 15% of math test scores) perceived significantly more stress than low-achieving high school students, but also experienced significantly fewer symptoms of anxiety, aggression, and somatic problems, whereas high and low achievers from China and Taiwan did not differ in terms of stress nor on most mental health indices (Crystal et al., 1994).

Factors that may protect the average IB student from experiencing worse adjustment include generally lower levels of stress in other areas, increased social support, and perhaps deriving a state of "flow" from their academic engagement. First, IB students in the current study faced relatively fewer hassles within five of seven sources of stress, three of which pertained to interpersonal relationships with peers and family members. This is important because strong relationships that yield social support often exert a "buffering effect" on physical and mental health (McNamara, 2000). Thus, IB students' relatively

positive (i.e., less stressful) relations with peers (possibly associated with the ability to learn with other teenagers who have similar abilities and motivations) and family may serve to buffer the potentially deleterious effects of stressors associated with the rigorous requirements of the IB program.

The term "flow" relates to how an individual feels when he or she is fully engaged in an activity. Flow captures an individual's complete involvement in the moment and occurs most often when the activity provides a balance between being challenging and appropriate for one's skills (Nakamura & Csikszentmihalyi, 2005). Strong links between flow experiences, personal expressiveness, and goal-directed behavior have been identified among both university and high school students (Schwartz & Waterman,. 2006; Waterman, 2005; Sharp et al., 2007). In the case of IB students, academic ability may be a form of personal expressiveness; when engaging in scholastic endeavors they may experience flow more often than other high school students, and thus be more motivated to achieve academically. The positive effects of being in a flow state might offset the negative effects of stress associated with the same activities (i.e., academic experiences), particularly since activities of flow are considered enjoyable albeit challenging.

Stress is typically inversely associated with academic functioning in the literature (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Kaplan, Liu, & Kaplan, 2005). Another unexpected finding in the current study is that this relationship generalized to IB students only. No sources of stress were significantly linked to worse achievement or attendance problems among general education students and, in fact, stress associated with academic requirements predicted better grades. One hypothesis for this finding is that, among typical high school students, the stress associated with academic demands may serve as a type of eustress that is facilitative and engenders actions that produce successful products. The term "eustress" was coined to indicate the positive aspects of stress in contrast to "distress," which represents the negative aspects (Selye, 1975). During both eustress and distress, positive or negative stimuli invoke similar bodily responses, but eustress causes much less damage than distress. Of note, this hypothesis is speculative as most studies of eustress focus on stress within the workplace (e.g., Cotton & Hart, 2003; Simmons & Nelson, 2001); our review of the literature yielded no studies examining the effect of eustress on adolescents' psychological or academic functioning.

Implications for Practice and Future Research

Mental health professionals who work with high school students in rigorous college preparatory programs should be cognizant of the fact that IB students are more likely to experience elevated stress related to academic demands (e.g., large school projects, homework, time management) as opposed to the more typical adolescent stressors related to managing conflicts with family and peers or struggling to make good grades. Second, IB students may be particularly vulnerable to the negative impact of high stress that stems from a variety of sources. Understanding student characteristics and culture of the IB Program may assist practitioners in developing effective prevention strategies (e.g., time and task management methods or peer-support systems), to help students cope with potentially overwhelming academic requirements.

Future research should attempt to address the limitations of the current study as well as to empirically identify the protective factors that serve to engender IB students' overall positive psychosocial adjustment. The current study is limited by a sample that consisted of students from one school in a rural setting. Additional research with students in urban and suburban environments is needed to extend the generalizability of findings. Nevertheless, the current study may serve as an important precursor to the development of a stress inventory for students in academically demanding secondary programs. Additional research geared toward validating the SOSI among different populations should consider adding items in order to strengthen those subscales that have relatively low internal consistency (i.e., academic struggles, problems within family). Further study is also needed to determine why IB students experience better academic functioning and intact social-emotional outcomes (Shaunessy et al., 2006) despite the fact that they report higher perceptions of overall perceived stress (Suldo et al., 2008) and, according to the current study, may manifest worse outcomes in the presence of stressors. Protective factors such as social support and flow/school engagement must serve to either buffer these students from experiencing declines in functioning or to elevate their general psychosocial health so that they have more room to diminish before appearing pathological. Studies that systematically assess and analyze possible moderators are needed to test such hypotheses.

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