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ORIGINAL PAPER

Associations between Stress, Psychosomatic Complaints, and Parental Criticism among Affluent Adolescent Girls

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Abstract A growing body of research has shown that adolescent girls in the context of affluence face a series of unique pressures that may increase social-emotional problems. Little research, however, has examined associations between perceived stress and psychosomatic complaints among privileged youth. In the present study, we investigated the relationships between stress, psychosomatic complaints, and parental criticism in a sample of pre-adolescent and adolescent girls ($n = 218$) from selective, private schools. Using OLS regression analyses, cross-sectional and longitudinal associations were evident between perceived stress and psychosomatic complaints, with increases in stress associated with increases in psychosomatic problems. Parental criticism was also examined as a predictor of girls' psychosomatic complaints and stress levels. Results indicated that parental criticism was significantly and positively associated with psychosomatic problems in cross-sectional models and that perceived stress levels mediated this association. Additional analyses demonstrated that the relationship between psychosomatic complaints and stress may be bidirectional. Taken together, results from this exploratory study suggest that girls in the context of affluence may also experience psychosomatic complaints, in addition to social-emotional problems.

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Introduction

In recent years, scholars have suggested that privileged youth may be at risk for significant maladjustment (e.g., Coley et al. 2017; Lund et al. 2017; Lund and Dearing 2013; Luthar 2003; Luthar et al. 2013). In particular, adolescents, especially girls, who grow up in affluent families and communities may be vulnerable to dysfunction in a number of developmental domains (e.g., substance use, delinquency, depression, anxiety) (Lyman and Luthar 2014). Various influences within competitive communities, schools, and homes may confer risk to these youth (Coley et al. 2017; Leonard et al. 2015; Lund and Dearing 2013; Lund et al. 2017). Namely, these settings have been characterized by pressures to achieve and disconnection that are, in turn, linked with youth dysfunction (Leonard et al. 2015; Luthar et al. 2013).

Despite increased the attention these issues have been given in the popular press and scientific community (Luthar et al. 2013; Rosin 2015), little quantitative research has examined the levels of self-reported stress among affluent youth (Leonard et al. 2015). Moreover, research on affluence has yet to investigate the health consequences of growing up in an upwardly-mobile context. An abundance of research with adults, however, indicates that stress is related with poorer health outcomes (e.g., Cohen et al. 1991).

Research from the last two decades demonstrates elevated rates of distress among affluent youth (Lund and

Dearing 2013; Lund et al. 2017; Luthar et al. 2013). Specifically, adolescent girls from privileged backgrounds report higher levels of internal distress (e.g., anxiety and depression) (Lund and Dearing 2013; Luthar and Becker 2002; Luthar and D'Avanzo 1999) and substance use problems (Luthar and Barkin 2012), whereas their male counterparts are more likely to demonstrate greater levels of delinquent behaviors (Goldstein and Luthar 2008; Lund and Dearing 2013). In other words, affluent girls report problems in both traditionally feminine (e.g., depression) and traditionally masculine domains (e.g., substance use) (Lyman and Luthar 2014; Luthar et al. 2013). Yet, recent evidence from an international study provides little evidence of gender differences in susceptibility to affluence (Lund et al. 2017).

Research suggests that the risk associated with growing up affluent is limited to the adolescent years (Lund and Dearing 2013; Luthar and Becker 2002). Pearlin's Stress Process Model acknowledges that stress originates from acute and chronic problems in social contexts (Pearlin et al. 1981; Pearlin 1989), such as the context of affluence. Despite the lack of research on stress associated with growing up affluent, some research has examined stressors associated with the context of affluence (Leonard et al. 2015; Lyman and Luthar 2014; Luthar et al. 2013). Adolescent girls growing up affluent often experience pressure and unattainable expectations in multiple areas of performance (Hinshaw and Kranz 2009; Luthar et al. 2013; Lyman and Luthar 2014; Spencer et al. 2016). Put simply, these girls often are expected to excel in all things traditionally feminine *and* in traditionally masculine domains without showing any signs of effort by demonstrating "effortless perfectionism" (Luthar et al. 2013). Not surprisingly, recent quantitative research suggests that girls in the context of privilege experience higher levels of perceived stress compared to their male counterparts (Leonard et al. 2015).

A growing body of research on affluence has pointed towards academic pressures within proximal contexts (i.e., in the home) as a significant stressor associated with increasing social-emotional dysfunction (Ciciolla et al. 2016; Leonard et al. 2015; Luthar et al. 2006). In particular, parents who are perceived as highly critical are more likely to have adolescents who report higher levels of internalizing and externalizing problems (Frost et al. 1990; Luthar et al. 2006). Girls may, in fact, be more sensitive to these parenting practices than their male counterparts (Ciciolla et al. 2016; Luthar and Latendresse 2005).

Moreover, parents that prioritize their children's academic achievements over integrity and well-being may be doing more harm than good (Ciciolla et al. 2016; Luthar et al. 2013). Adolescents who believe their parents value prosocial goals as much or more than extrinsic goals (e.g., getting good grades) have better psychological functioning and higher levels of academic achievement (Ciciolla et al. 2016). Within affluent contexts, parents may also experience extraordinary pressures (Luthar 2003; Luthar et al. 2013; Myers 2000). The consequences of parental stress may manifest in more critical parenting and less sensitive practices that can ultimately compromise youth functioning (Luthar 2003). Despite evidence that parental pressures to excel are associated with maladjustment in a number of domains, no research that we are aware of examines how these pernicious parenting practices impact adolescent stress levels and psychosomatic complaints.

Adolescence is a critical time for one's health because many behaviors and habits formed during these years can impact later health outcomes (Spear and Kulbok 2001). Psychosomatic complaints are measures of health that include both psychological and somatic concerns (Ravens-Sieberer et al. 2008). In studies using nationally representative data, adolescent girls from the United States report higher levels of psychosomatic complaints (e.g., headaches) than their male counterparts (Ghandour et al. 2004; Torsheim et al. 2006). Reports of these problems often increase over the course of adolescence, too (Ghandour et al. 2004; Torsheim et al. 2006). Despite the importance of health during the adolescent years and established gender differences in psychosomatic problems, research on affluent youth has largely focused on risky behaviors (e.g., sexual activity and substance abuse) (Lund et al. 2017; Lyman and Luthar 2014).

At the same time, increases in socioeconomic status are also linked with decreases in health problems (e.g., asthma) (Chen et al. 2002). However, Luthar and Barkin (2012) found that affluent girls reported significantly higher levels of somatic complaints than their male counterparts and, in many cases, at or above clinically significant levels (Luthar and Barkin 2012). In this study, parental criticism was linked with somatic complaints in a subsample of affluent girls (Luthar and Barkin 2012). Research examining psychosomatic complaints among adolescent girls in privileged, but stressful contexts is greatly needed.

It is worth noting that in some cases stress may be viewed as positive (i.e., "good stress") (e.g., Thoits 1995). An individual's belief about whether they can meet the demands of a stressful situation (i.e., a stressor) and effectively cope will determine whether or not one *feels* stressed (Lazarus and Folkman 1984). Leonard et al. (2015) found that some affluent youth described stress as beneficial (e.g., as motivating). Research on high-achieving adolescents indicates that while these adolescents may experience higher levels of stress (Suldo et al. 2008), they do not simultaneously experience problematic outcomes (Suldo and Shaunessy-Dedrick 2013). Yet, some evidence suggests

that school stress is linked to a greater frequency of psychosomatic complaints (Torsheim and Wold 2001).

The purpose of this exploratory study was to examine the associations between stress, psychosomatic complaints, and critical parenting in a sample of affluent girls. More precisely, we examined associations between perceived stress and psychosomatic complaints among privileged preadolescent and adolescent girls. Despite limited research in this area, it was hypothesized that higher levels of perceived stress would be associated with higher levels of psychosomatic complaints both contemporaneously and longitudinally. We suspected that stress would be associated with short-term and long-term increases in psychosomatic complaints given prior research with adult samples and limited existing research with affluent adolescents. We also examined an additional hypothesis with regard to critical parenting given the dearth of research in this area. More specifically, we investigated whether parental pressures (i.e., critical parenting) predicted psychosomatic complaints directly and if perceived stress mediated this association. We hypothesized that parental criticism would be associated with higher levels of psychosomatic complaints and perceived stress would account for this relationship. We also examined these relationships contemporaneously and longitudinally.

Method

Participants

The present study used secondary data analysis of a longitudinal mixed-methods study of adolescent girls, *21st Century Athenas: Aligning Achievement and Well-Being*. The sample ($n = 218$) is comprised of preadolescent and adolescent girls from two private, single-sex schools located in suburban areas of the Northeast and Midwestern United States, respectively. Both schools are competitive academically and report 100% college placement. In addition, both schools have athletic programs with high participation rates. While both schools primarily educate day students, one of the schools has boarder students. The boarder student population accounts for a small proportion of the sample of students. At the first wave of data collection, approximately 11% of eligible participants were boarder students.

Three cohorts of girls were tracked over four waves of data collection with girls enrolled in either the 6, 8, or 10th grade at the first wave of data collection. At the second wave of data collection, the 6th graders were in 7th grade and so on (i.e., 8th grade girls were now in 9th grade and 10th grade girls were now in 11th grade). At the final wave of data collection, the 6th graders were in 8th grade, the 8th graders were in 10th grade, and the 10th graders were in 12th grade. Wave 2 data was collected in the Fall of 2011 (September and October), Wave 3 data was collected in the Spring of 2012 (March and April), and Wave 4 data was collected in the Fall of 2012 (September and October). In our study, we focused on data from Wave 2, Wave 3, and Wave 4 as data on all of the variables of interest were not available at all four waves. We used cross-sectional and longitudinal data to examine immediate impacts of stress on psychosomatic problems and the long-term effects.

The sample used in the present study is fairly homogenous with regard to race/ethnicity and socioeconomics. In particular, over 80% of participants (84%) self-identified as White. The median annual family income was between $270,000 and $285,000. Furthermore, students in the present study were mostly from suburban areas.

Procedure

Prior to Wave 1 data collection, we obtained Institutional Review Board approval from Boston College. We obtained assent from the preadolescent and adolescent girls and informed consent from parents/guardians prior to data collection. Participation rates were quite high (about 70%). Participants did not receive compensation for their participation. Preadolescent and adolescent girls completed online surveys using *Qualtrics* during a class period during the school day. In some cases, students needed additional time beyond one class period.

Measures

Perceived stress scale

The perceived stress scale (PSS) was used in the present study to measure girls' levels of perceived stress (Cohen et al. 1983). Previous research indicates that this measure has excellent psychometrics (Cohen et al. 1983) and has been used in other studies examining adolescent stress in the context of affluence (Leonard et al. 2015). Participants were asked to respond to 14 items and rated how frequently they felt a certain way on a five-point Likert-type scale, with response categories ranging from "0 = never" to "4 = very often". A sample item from the scale is "In the last month, how often could you not cope with all the things that you had to do?" Higher scores are indicative of higher levels of perceived stress. The reliability was good for the PSS at Wave 2 ($\alpha = .62$) and excellent at Wave 3 ($\alpha = .84$) and Wave 4 ($\alpha = .80$), respectively.

Psychosomatic complaints

The Health Behavior in School-aged Children (HBSC) symptom checklist (Currie 1998) was used to assess

psychosomatic symptoms among girls in the present study. This scale contains eight items or different types of symptoms. The specific symptoms assessed include: (1) headache; (2) abdominal pain; (3) backache; (4) depressed mood; (5) irritable; (6) nervousness; (7) sleeping difficulties; and (8) dizziness. Respondents are asked to rate how often they have had a specific symptom in the past 6 months, with symptom frequency rated on a five-point scale ranging from "5 = about every day;" "4 = more than once a week;" "3 = about every week;" "2 = about every month;" and "1 = rarely or never." Higher scores on the HBSC indicate higher levels of psychosomatic problems. Reliability for this measure was excellent at all three waves (Wave 2: $\alpha = .87$; Wave 3: $\alpha = .88$; Wave 4: $\alpha = .89$).

Critical parenting

Girls' perceptions of critical parenting were assessed at each wave of data collection using a subscale from the Multidimensional Perfectionism Scale (FMPS; Frost et al. 1990). Parental criticism was measured using a four-item subscale. A sample item of parental criticism is, "My parents never try to understand my mistakes." Items were rated on a five-point Likert scale; response options ranged from "1 = Strongly Disagree" and "5 = Strongly Agree." The internal consistency for the parental criticism scale was quite good at Wave 2 ($\alpha = .85$), Wave 3 ($\alpha = .84$), and Wave 4 ($\alpha = .87$).

Demographics

Student demographic variables were collected at all waves of data collection. In the present study, student grade, race, school, and years at school were considered in statistical models as controls for omitted variable bias.

Data Analyses

We examined frequencies of symptom levels for psychosomatic complaints at Wave 2. We also compared selected symptom levels for the overall sample with data from a nationally representative sample of adolescent girls in 6th through 10th grade (Ghandour et al. 2004). This approach is similar to previous work conducted by Luthar and colleagues in which problem levels of affluent adolescents were compared to national norms (Luthar and Barkin 2012; Luthar and Becker 2002; Luthar and D'Avanzo 1999). In particular, in order to make direct comparisons with these studies, we applied Ghandour et al.'s approach (2004) of collapsing the two categories for the greatest frequency (i.e., "about every day" and "more than once a week").

We examined descriptive statistics for the primary variables of interest at Waves 2, 3, and 4. We also conducted a series of analysis of variance (ANOVA) analyses to examine whether girls in our sample differed on the primary variables as a function of grade. We focused our cross-sectional analyses on Wave 2 and, consequently, present inferential statistics from Wave 2, only. ANOVA models for Wave 3 and Wave 4 are available upon request from the authors and differed very little from Wave 2 results. We also examined whether girls in our sample differed on the primary variables as a function of school using independent samples *t*-tests.

Correlation analyses and regression analyses were also conducted to examine associations between perceived stress, psychosomatic complaints, and parental criticism. Correlations examined associations within and across waves. Regression models examined contemporaneous and longitudinal associations to determine if stress had immediate and/or long-term impacts. Contemporaneous regression models focused on associations at Wave 2 and longitudinal models focused on associations regarding cumulative stress (average perceived stress from Waves 2 and 3) and psychosomatic complaints at Wave 4.

We also examined whether parental criticism predicted girls' psychosomatic complaints and if perceived stress mediated this association. Following the steps outlined by Baron and Kenny (1986), regression models were estimated in which parental criticism at Wave 2 predicted psychosomatic complaints at Wave 2. Second, models examined whether parental criticism predicted girls' reports of perceived stress at Wave 2. Finally, models examined whether the association between parental criticism and psychosomatic complaints was still significant with perceived stress included in the regression model at Wave 2.

Finally, supplemental analyses were conducted on the relationship between stress and psychosomatic complaints in the opposite direction; that is, do psychosomatic complaints predict perceived stress? In addition, we ran models in which stress levels at Wave 4 were estimated as a function of cumulative psychosomatic complaints (average psychosomatic complaints at Waves 2 and 3). Finally, we examined whether positive parenting moderated associations between perceived stress and psychosomatic complaints at Wave 2. In line with Pearlin's Stress Process Model (Pearlin et al. 1981; Pearlin 1989), supportive relationships can mitigate the harmful impacts of stress on functioning. Using the Inventory of Parent and Peer Attachment (Armsden and Greenberg 1987), a composite variable of positive parenting that combined parental trust and parental communication was created. This variable had excellent reliability ($\alpha = .95$).

Table 1 Psychosomatic symptom levels at wave 2

Frequency	Headache (%)	Abdominal pain (%)	Backache (%)	Depressed mood (%)	Irritable (%)	Sleeping difficulties (%)	Nervousness (%)	Dizziness (%)
Rarely or never	37.8	45.3	48.9	50.2	29.3	39.1	24.4	62.7
About every month	24.9	35.6	23.6	24.4	33.8	17.3	20.9	17.8
About every week	17.3	8.4	9.3	12.0	18.7	19.1	27.6	8.9
More than once a week	13.8	7.6	9.3	8.0	12.4	10.2	15.6	4.4
About every day	6.2	3.1	8.9	5.3	5.8	14.2	11.6	6.2

Results

Frequencies of symptom levels for psychosomatic complaints at Wave 2 are presented in Table 1. Girls in the present study reported less frequent problems (i.e., headaches, stomachaches, and backaches). In the present study, 20.0% of girls reported having a headache more than once a week, whereas 29.1% of girls reported having a headache more than once a week in the sample from Ghandour et al. (2004). In addition, 20.2% of girls reported having a stomachache more than once a week and 23.6% reported having a backache more than once a week in a nationally representative sample (Ghandour et al. 2004). Our findings demonstrated that only 11.7% of girls reported having a stomachache more than once a week and 18.2% reported having a backache more than once a week.

Table 2 displays descriptive statistics (e.g., means) for our primary variables. In the ANOVA models at Wave 2, the assumption of homogeneity of variance was violated for psychosomatic problems, but not for stress or parental criticism. Results indicated that there were statistically significant differences between stress and psychosomatic complaints ($p < .05$) as a function of grade; differences in grade were not statistically significant for parental criticism ($p = .095$). Bonferroni post-hoc tests indicated that the youngest students (7th graders) reported significantly lower perceived stress than did their older counterparts in 9th ($p < .05$) and 11th grade ($p < .05$). Moreover, 9th graders had significantly lower perceived stress than 11th graders ($p < .05$). Results indicated 11th graders had significantly higher levels of psychosomatic complaints than did 9th ($p < .05$) and 7th graders ($p < .05$). There were no differences between 7th and 9th grade girls.

Finally, there were no differences in overall psychosomatic complaints between the two schools at each wave of data collection ($p > .05$). With regard to specific psychosomatic complaints, there were no differences across all complaints with the exception of irritability at Wave 2 ($p = .018$) and at Wave 4 ($p = .009$). However, when a Bonferroni correction was applied the difference between schools was no longer statistically significant. Analyses also indicated that there were no significant differences in perceived stress levels as a function of school at each wave of data collection ($p > .05$).

Table 2 Descriptive statistics for primary variables at waves 2, 3 and 4

Variable	*M (SD)*
Parental criticism Wave 2	8.76 (3.53)
Perceived stress Wave 2	27.67 (5.87)
Psychosomatic complaints Wave 2	17.33 (6.95)
Parental criticism Wave 3	8.74 (3.50)
Perceived stress Wave 3	27.48 (8.31)
Psychosomatic complaints Wave 3	18.17 (6.98)
Parental criticism Wave 4	9.11 (3.51)
Perceived stress Wave 4	28.46 (7.72)
Psychosomatic complaints Wave 4	18.68 (7.48)

Primary Results

Table 3 displays correlations between perceived stress, psychosomatic problems, and parental criticism at Wave 2, Wave 3, and Wave 4. All correlations were significant and in the expected direction. Perceived stress was positively associated with psychosomatic complaints both within and across waves. That is, higher levels of stress were associated with higher levels of psychosomatic problems. In general, perceived stress was positively associated with parental pressures within and across data collection waves. Psychosomatic complaints were also positively associated with parental criticism both within and across waves, with higher levels of psychosomatic complaints significantly related to higher levels of parental criticism.

Regression models examined associations between perceived stress and psychosomatic complaints at each wave of data collection to investigate contemporaneous relationships. Residual analyses indicated no violations of assumptions of normality. Outliers were detected in several regression models, however. Analyses were conducted with

Table 3 Intercorrelations between perceived stress, psychosomatic complaints, and parental criticism across and within waves 2, 3, and 4

Measure		1	2	3	4	5	6	7	8	9
1	Stress $_{W2}$	–								
2	Stress $_{W3}$	.58**	–							
3	Stress $_{W4}$	.57**	.65**	–						
4	Psychosomatic $_{W2}$	.58**	.54**	.43**	–					
5	Psychosomatic $_{W3}$	.54**	.63**	.48**	.73**	–				
6	Psychosomatic $_{W4}$	.49**	.49**	.60**	.65**	.73**	–			
7	Criticism $_{W2}$	.40**	.44**	.32**	.41**	.32**	.26**	–		
8	Criticism $_{W3}$	.32**	.49**	.31**	.35**	.41**	.32**	.67**	–	
9	Criticism $_{W4}$	.27**	.40**	.34**	.34**	.34**	.34**	.66**	.71**	–

**$p < .01$, *$p < .05$

and without outliers and results were substantively similar. Consequently, the outliers remained in the models to preserve sample size. First, psychosomatic complaints at Wave 2 were estimated as a function of perceived stress at Wave 2 and student covariates (Table 4). Results indicated that perceived stress significantly predicted psychosomatic complaints at Wave 2 ($\beta = .53$, $t = 8.54$, $p < .001$). Contemporaneous regression models estimated with data from Waves 3 and 4, respectively, which yielded similar results; that is, higher levels of perceived stress, were significantly and positively associated with girls' psychosomatic complaints. Taken together, there was support for contemporaneous associations between perceived stress and girls' psychosomatic complaints.

Residual change regression models examined the longitudinal relationships between perceived stress and psychosomatic complaints to uncover whether cumulative stress at earlier waves of data collection predicted psychosomatic complaints later in the study, after accounting for early psychosomatic complaints. That is, longitudinal models examined the impact of cumulative levels of stress (average levels at Waves 2 and 3) predicting psychosomatic complaints at Wave 4. Results (as displayed in Table 5) indicated that cumulative levels of stress were associated with higher levels of psychosomatic complaints at Wave 4 ($\beta = .27$, $t = 3.85$, $p < .001$), even after controlling for prior levels of psychosomatic complaints.

Results indicated that parental criticism predicted psychosomatic complaints at Wave 2 ($\beta = .36$, $t = 5.99$, $p < .001$) and perceived stress at Wave 2 ($\beta = .34$, $t = 5.95$, $p < .001$). In models when criticism and perceived stress were entered as predictors of psychosomatic complaints, both emerged as significant predictors of psychosomatic problems (Table 6). The coefficient for criticism was reduced in models in which perceived stress was entered, however ($\beta = .36$ vs. $\beta = .23$). Taken together, there was evidence for partial mediation of the association between parental criticism and girls' psychosomatic complaints by perceived stress levels.

Table 4 Cross-sectional regression analysis summary for levels of stress (wave 2) predicting psychosomatic complaints (wave 2)

Variable	*B*	*SE B*	B	*t*	*p*
School	−.48	.81	−.04	−.60	.550
Other race	.65	1.18	.03	.55	.58
Black	1.68	1.58	.06	1.07	.288
Grade 7	−1.59	1.08	−.10	−1.48	.141
Grade 9	−2.45	.01	−.17	−2.70	..007
Year at school	.24	.19	.08	1.29	.198
Stress W_2	.63	.07	.53	8.54	.000***

$R^2 = .38$ ($n = 218$, $p < .001$). *$p < 0.05$, **$p < 0.01$, ***$p < 0.01$

In addition, longitudinal mediation regression models were examined in which parental criticism at Wave 2 was estimated as a predictor of psychosomatic complaints at Wave 4. Perceived stress at Wave 3 was examined as a mediator of this association. In the least conservative statistical models, where prior levels of functioning were not controlled for, results supported mediation. More specifically, parental criticism at Wave 2 was associated with psychosomatic complaints at Wave 4 ($\beta = .24$, $t = 3.56$, $p < .001$) and perceived stress at Wave 3 ($\beta = .43$, $t = 6.91$, $p < .001$). In the regression model with perceived stress at Wave 3 and parental criticism at Wave 2 entered as predictors of psychosomatic complaints at Wave 4, perceived stress was positively associated with psychosomatic complaints ($\beta = .46$, $t = 6.32$, $p < .001$) and parental criticism was not ($\beta = .04$, $t = .52$, *NS*). This mediational chain was not evident in models with controls for prior psychosomatic complaints and perceived stress.

Supplemental Analyses

Results from our supplemental analyses indicated that psychosomatic complaints significantly predicted perceived

Table 5 Longitudinal regression analysis summary for cumulative levels of stress (waves 2 & 3) predicting later psychosomatic complaints (wave 4)

Variable	*B*	*SE B*	B	*t*	*p*
School	−.27	.82	−.02	−.36	.719
Other race	−1.62	1.23	−.07	−1.32	.190
Black	1.73	1.70	.06	1.02	.308
Grade 7	.13	1.07	.01	.12	.905
Grade 9	.19	.95	.01	.20	.841
Years at school	.26	.19	.08	1.35	.177
Cumulative stress	.33	.08	.27	3.85	.000***
Psychosomatic W_2	.52	.08	.47	6.83	.000***

$R^2 = .47$ ($n = 205$, $p < .001$). *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 6 Cross-sectional mediation model for perceived stress mediating associations between parent criticism and psychosomatic complaints at wave 2

Variable	*B*	*SE B*	B	*t*	*p*
School	−.71	.78	−.05	−.91	.364
Other Race	.37	1.14	.02	.33	.746
Black	1.27	1.53	.05	.83	.408
Grade 7	−1.94	1.05	−.12	−1.85	.066
Grade 9	−2.32	.88	−.16	−2.65	.009*
Years at school	.20	.18	.06	1.11	.269
Stress W_2	.51	.08	.43	6.68	.000***
Parental criticism W_2	.45	.11	.23	3.92	.000***

$R^2 = .42$ ($n = 217$, $p < .001$). *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

stress levels at Wave 2 ($\beta = .49$, $t = 8.54$, $p < .001$). Cumulative levels of psychosomatic complaints were associated with stress levels at Wave 4 ($\beta = .21$, $t = 2.84$, $p < .01$). Taken together, findings indicated that psychosomatic complaints were predictive of stress levels both contemporaneously and longitudinally, with earlier levels of psychosomatic complaints associated with later stress levels.

Finally, supplemental models that examined whether positive parenting buffered girls against the consequences of perceived stress indicated that positive parenting did not significantly moderate the association between perceived stress and psychosomatic complaints ($\beta = -.07$, $t = -1.17$, $p = .243$). In models that simply examined associations between positive parenting and girls' psychosomatic complaints, positive parenting was associated with lower levels of psychosomatic problems ($\beta = -.33$, $t = -5.52$, $p < .001$).

Discussion

Developmental science and the popular press have documented that girls from privileged, high-achieving backgrounds often struggle with significant social-emotional dysfunction (e.g., Levine 2006; Lund et al. 2017). In particular, girls raised in these contexts report higher levels of internal distress (e.g., anxiety) and substance use problems compared to their less privileged counterparts (e.g., Luthar and D'Avanzo 1999). The present study seeks to unpack the mechanisms through which high-achieving, privileged communities potentially contribute to "illbeing" among adolescent girls.

In particular, our findings indicated that perceived stress levels were higher and psychosomatic complaints more common among older adolescent girls compared to pre-adolescent girls from affluent contexts. These results are generally consistent with previous research that has shown that older adolescent girls (i.e., 15-year old girls) reported greater levels of psychosomatic complaints on the HBSC compared to their younger counterparts (Torsheim et al. 2006). This is also consistent with previous research suggesting that the pernicious effects of affluence may be especially pronounced in adolescence (e.g., Lund and Dearing 2013). In comparison to data from nationally-representative samples, girls in this study demonstrated lower symptom levels (Ghandour et al. 2004). On the one hand, this was surprising given that other research that has so consistently demonstrated elevated problems in youth, especially adolescent girls, from affluent communities (e.g. Luthar and Becker 2002; Luthar and D'Avanzo 1999; Luthar and Barkin 2012). On the other hand, lower symptom levels in our sample may be explained in that these students attend girls' schools that include in their mission an attempt to support the overall development and wellbeing of their students.

Second, results from the present study suggest strong relationships between perceived stress, psychosomatic complaints, and parental criticism. In general, greater stress levels were detrimental to girls' psychosomatic functioning. Regression models suggested that perceived stress levels predicted psychosomatic complaints both contemporaneously and longitudinally. In other words, perceived stress can have immediate, short-term impacts on psychosomatic problems, but also long-term effects. Additional models also suggested that the predicted association could work in the opposite direction, with psychosomatic complaints predicting stress both contemporaneously and longitudinally. More research is needed, however, to unpack this bidirectional relationship.

Parental criticism, a chronic stressor in the context of affluence (Pearlin 1989; Luthar et al. 2006), was also associated with increased psychosomatic complaints in our sample. Mediation analyses indicated that the direct

association between parental criticism and psychosomatic complaints was partially mediated by girls' perceived stress. These results suggest that the pernicious effects of parental pressures to excel on girls' psychosomatic complaints are accounted for by increasing levels of perceived stress. These findings are significant for two reasons. This study demonstrated that parental pressures (i.e., parental criticism) may threaten the health of girls from affluent backgrounds (Luthar and Barkin 2012); previous work has focused primarily on the impact of parental pressures on social-emotional problems among privileged teens (e.g., Luthar et al. 2006). Second, our results suggest that adolescent girls' experience of psychological stress may be the mechanism through which critical parenting has the potential to cause psychosomatic problems. No research that we are aware of examines the processes through which these pressures transmit their impacts.

Limitations and Future Research Directions

While this study has a number of strengths, there are several limitations that are worth noting. First, this was an observational study and, consequently, it is likely that omitted variables influenced our results despite statistical controls (e.g., demographic variables). Furthermore, while we hypothesized causal relationships between stress, psychosomatic problems, and parental criticism based on previous literature, we were unable to prove causality with our analyses. For example, we cannot establish temporal order between our variables with cross-sectional analyses. Moreover, when interpreting our regression models examining associations between stress and psychosomatic complaints, we are unable to determine the direction of the relationship. Future research should be done to extend our findings on these reciprocal relationships.

While our regression models did not appear to violate any assumptions, other inferential statistics presented in this paper did violate assumptions. In particular, violations of homogeneity of variance were evident in our ANOVA models and, as such, these results should be interpreted with caution. An additional concern is the possibility of practice effects; students' responses may change over time due to repeated exposure to the same surveys. Finally, our results based on a unique population (i.e., privileged girls from single-sex private schools) may not generalize to different populations.

Future research should examine sources of stress outside of the family that contribute to the observed maladjustment among affluent girls. It is important to note that the current findings do not demonstrate that parents are to blame for their daughters' maladjustment, but that parents themselves may feel pressured to help their children succeed in the context of larger societal pressures that narrowly define success (Liang et al. 2017; Spencer et al. 2016). Thus, research should examine mechanisms within the larger context (e.g., neighborhoods, schools, and society) that may threaten the health of youth from privileged backgrounds (e.g., Coley et al. 2017; Lund et al. 2017; Lund and Dearing 2013). Future research could also examine whether or not girls with higher levels of perceived stress partake in riskier behavior (e.g., substance use). Much research on affluence has examined elevated risky behaviors in this population, few studies have yet to connect these behaviors to youth reports of stress (Leonard et al. 2015). Future research should examine other aspects of the parent-adolescent relationship that contribute to girls' stress and psychosomatic complaints in the context of privilege, including messages about achievement and perfectionism (Luthar et al. 2013; Spencer et al. 2016). Moreover, in keeping with a positive youth development (PYD) perspective, future research should examine whether purpose in life is a protective factor for girls growing up in the context of affluence. Indeed, a narrow focus on achievement has been discussed as a significant risk to healthy adjustment in girls from such backgrounds (e.g., Spencer et al. 2016), whereas other research shows that youth purpose is associated with a variety of positive outcomes in this population (e.g., Liang et al. 2017).

Finally, future work on affluence should include samples that are representative in terms of race, ethnicity and geographic diversity. Research with diverse socioeconomic groups may also contribute to our understanding of risk across the socioeconomic spectrum. Studies could examine whether girls living in low-income contexts and those living in affluent contexts experience unique or similar risks with regard to psychosomatic complaints and perceived stress. Despite the limitations of the present study, this exploratory study of stress, psychosomatic complaints, and critical parenting provides an important first step to better understand the health consequences of growing up in affluent communities and suggests many avenues for future research that can help parents and educators support girls who are, quite literally, "worrying themselves sick".

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human subjects were in accordance with the ethical standards of the institution or practice at which the studies were conducted.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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