



Students in High-Achieving Schools: Perils of Pressures to Be “Standouts”

Suniya S. Luthar^{1,2} · Bin C. Suh³ · Ashley M. Ebbert^{4,5} · Nina L. Kumar⁴

Published online: 6 July 2020
© Springer Nature Switzerland AG 2020

Abstract

Youth in high-achieving schools (HASs) are now declared to be an “at-risk group,” largely because of strong, ongoing pressures to achieve. In this study, we sought to disentangle processes that might underlie *how* achievement pressures might exacerbate distress, considering five dimensions conceptually important in HAS settings: feelings of envy, comparisons with others on social media, negative feedback from others, the ability to maintain supportive friendships with peers, and overall time pressures. Also included were two potential confounds: time spent on social media and attachment to parents. Across three different HAS samples (total $N = 1608$), these dimensions were examined in relation to anxious-depressed, withdrawn-depressed, and somatic symptoms, and rule-breaking behaviors using multivariate analyses conducted separately by school and gender. Results revealed that associations between social comparisons and internalizing symptoms were consistent in all subgroups, with robust effect sizes throughout. Additionally, negative feedback on social media was linked with rule-breaking behavior in five out of six subgroups. Results indicated the critical value of targeting social comparisons, in particular, followed by negative feedback on social media in future interventions aimed at fostering resilient adaptation among HAS youth.

Keywords Resilience · Social media · Social comparisons · Adolescents · High-achieving schools

The focus of this paper is on critical risk and protective processes linked with well-being among youth at high-achieving schools (HASs), now declared to be at risk in major policy reports (Geisz & Nakashian, 2018; National Academies of Science, Engineering, and Medicine [NASEM] 2019). Referenced here are schools with good standardized test scores, rich extracurricular offerings, and students heading to selective universities. The NASEM (2019) consensus study report included HAS students among subgroups of youth

“at-risk” along with others typically thought as vulnerable, such as children in poverty, and those who have experienced parental incarceration or placement in foster care. These assertions echo statements in a Robert Wood Johnson Foundation report (Geisz & Nakashian, 2018), wherein the top four environmental risks compromising adolescent well-being, in order, were exposure to poverty, trauma, discrimination, and excessive pressure to achieve—usually seen in relatively affluent communities.

The goal in this paper is to disentangle mechanisms that might underlie, or explain, the process via which attendance at a HAS might confer risk for maladjustment. Accumulated evidence shows that HAS youth manifest disturbingly high rates of both internalizing and externalizing symptoms, as well as substance use. As noted above, a core underlying reason is posited to be ongoing pressures to accumulate distinctions in academics and extracurriculars (for a review, see Luthar, Kumar, & Zillmer, 2019). The effort here was to explore the potential role of several constructs that are *conceptually related to this overarching risk factor*—high achievement pressures—following recommendations for resilience research on

✉ Suniya S. Luthar
SLuthar@authconn.com

¹ Authentic Connections, Tempe, AZ, USA

² Emerita, Columbia University’s Teachers College, New York, NY, USA

³ Edson College of Nursing and Health Innovation, Arizona State University, Phoenix, AZ, USA

⁴ Authentic Connections, Cambridge, MA, USA

⁵ Department of Psychology, Arizona State University, Pheonix, NY, USA

any little studied group of at-risk youth (Luthar et al., 2019).

Achievement Pressures and Peer Relationships: Social Comparisons

An unfortunate byproduct of exposure to ongoing achievement pressures (Geisz & Nakashian, 2018; NASEM, 2019) is heightened competitiveness and comparisons among peers (Luthar et al., 2019). Within HAS settings, research has, in fact, demonstrated the “Big Fish Little Pond Effect,” wherein growing up in a group of academically well-performing students is apparently worse for students’ academic self-concepts than being the best among average students (Becker & Neumann, 2018; Fang et al., 2018). The underlying mechanism is posited to be constant comparisons with a group of highly talented schoolmates, exacerbating anxiety (about falling behind) and distress (when not among the very top performers).

When students are in ongoing competition for distinctive status, there is also potential for *envy*, which in turn can increase risks for psychopathology (Vogel, Rose, Roberts, & Eckles, 2014). Envy refers to “an unpleasant and often painful blend of feelings characterized by feelings of inferiority, hostility, and resentment” when individuals see others as doing better than they are, themselves (Smith & Kim, 2007, p. 47). Past research has shown that as compared to their counterparts in a low-income, magnet school, teens in a high-achieving private school reported significantly higher envy of peers surpassing them in several realms, including popularity, attractiveness, and sports (Lyman & Luthar, 2014). In the latter group, furthermore, high levels of envy were linked with greater levels of externalizing problems, as well as poorer relatedness with others, especially among females.

We also examined the potential role of HAS adolescents’ *comparisons with others on social media*. In the USA, large proportions of teens in general report using sites, such as YouTube (85%), Instagram (72%), and Snapchat (69%). The potential for ill-effects is seen in references to social media as a “comparison trap”, wherein the numbers of followers and likes are proof of a person’s worth (Webber, 2017). On social media platforms, adolescents’ comparisons with others—and thus levels of self-esteem—can vary not only with the positive feedback they receive on postings (Burrow & Rainone, 2017), but also with judgments on the quality of their lives versus those of others (Vogel et al., 2014). Unfortunately, individuals tend to compare their true, offline identity to others’ idealized identities. Studies have also shown that upward comparisons—i.e., comparisons with others who are perceived to be superior—consistently mediate the links between social media use and poor well-being (Fardouly & Vartanian, 2015; Vogel et al., 2014).

Negative and Positive Interactions with Peers

In highly competitive environments, there are also potential risks for heightened resentment as many are vying to be the very best among the best (Lyman & Luthar, 2014), and such hostility can be yet another conduit to distress. As noted above, envy involves antipathy to others and, when expressed directly, can lead to distress from those victimized. Studies have shown that when teens are on the receiving end of *negative feedback* from others, including forms of relational victimization such as being gossiped about or being left out, they are vulnerable to high distress (Murray-Close, Holterman, Breslend, & Sullivan, 2017). Such reactions to negative social feedback tend to be particularly pronounced among those whose self-esteem depends largely on external judgments (Li et al., 2016). These responses are also likely heightened among adolescents generally, who not only are exquisitely sensitive to others’ feedback but also tend to internalize such feedback (Rodman, Powers, & Somerville, 2017). In view of this evidence, we considered adolescents’ reports of negative feedback from others as a third potential risk mechanism, in addition to social media comparisons and envy.

Also examined was *support from close friends*. In HAS settings, being in constant competition with peers can threaten the ability to maintain closeness and trust within friendships (Luthar et al., 2019); in instances when this closeness *can* be maintained, there could be substantial beneficial effects. Studies have shown that during adolescence, friendship qualities mitigates the effect of victimization (Kawabata & Tseng, 2019) through perceived emotional support from close friends (Schacter & Juvonen, 2019). In a longitudinal study that followed healthy adolescents until young adulthood, supportive friendships had positive associations with resilient functioning during both adolescence and adulthood, even more so than family support (Van Harmelen et al., 2017). Accordingly, perceived support from close friends was considered a fourth potentially important risk modifier in this study.

Time Pressures

Yet another likely factor implicated in high distress among HAS students is *time pressure*. These adolescents tend to have demanding academic and extracurricular schedules, with little down time, as exemplified in statements, such as the following: “Even though I was getting A’s and B’s, mostly A’s, in all my classes — all my honors classes — I still felt it wasn’t good enough” (Aubrey & Greenhalgh, 2018). As reported in the policy report on adolescent wellness (Geisz & Nakashian, 2018), time pressure is associated with heightened stress and low well-being in educational settings (see also Smith, 2019). Thus, time pressure was included as another potential risk factor in this study with HAS youth.

Potential Confounds

In order to ascertain links between the core variables of interest outlined earlier—all conceptually important in high-achieving settings—also considered were two variables that could have served as confounds in any links with distress. The first of these variables was the sheer amount of *time spent on social media*. It is possible that rather than specific emotions evoked in social media use—around comparisons with others or feeling ill-treated by them—it is simply spending too much time on social media that is inimical for mental health. Several studies have shown associations between high social media use and internalizing symptoms (Barry, Sidoti, Briggs, Reiter, & Lindsey, 2017; Pittman & Reich, 2016; Turel & Serenko, 2012; Twenge, Martin, & Spitzberg, 2018). In a recent longitudinal cohort study, spending more than 30 minutes on social media was linked with higher internalizing problems among adolescents, even after adjusting for demographics, substance use, and past mental health problems (Riehm et al., 2019). A critical underlying mechanism likely involves lack of time to invest in quality, in-person relationships with peers (Twenge, Spitzberg, & Campbell, 2019).

Finally, we included adolescents' levels of *attachment to parents*, essentially to control for any general proclivities among teens to see relationships as being generally supportive or negative. When trying to identify aspects of adolescents' perceived interpersonal interactions that have unique significance for mental health, it is useful to partial out, in multivariate analyses, other variables that are likely to share variance with them. Attachment research clearly shows that the quality of relationships with parents is critical in forming the lens through which relationships with others, outside the family, are viewed (Gorrese & Ruggieri, 2012; Yates, Egeland, & Sroufe, 2003). Attachment relationships may also be related to how adolescents perceive criticism from others (Morris, Criss, Silk, & Houltberg, 2017). Thus, subjective feelings on both positive and negative dimensions were assessed in relation to mothers and fathers, separately, and both were included in multivariate analyses aimed at disentangling ramifications of the relational processes of central interest here.

Operationalization of Outcomes

With regard to operationalization of outcome variables, the focus here was on indices known to be elevated among youth in high-achieving schools (Luthar et al., 2019). These included multiple internalizing symptoms, including depression, anxiety, and somatic problems, all of which are exacerbated

among youth contending with high, ongoing achievement pressures. Also included was rule-breaking behavior, which includes aspects of cheating and stealing, as well as substance use.

A final design feature was that this study included multiple cohorts of HAS students. In essence, this allowed for conceptual replication of findings across multiple samples, all assessed using the same methods and procedures (Maner, 2014; Sheldon & Hoon, 2007; Stroebe & Strack, 2014). Such replication is especially useful when examining issues and populations heretofore little studied; any associations recurrently found can provide the basis for specific a priori hypotheses in future research (Cumming, 2012; Luthar & Ciciolla, 2015; Vosgerau, Simonsohn, Nelson, & Simmons, 2019). Thus, all analyses in this study were conducted with three different HAS cohorts, one each from the Southwest, the Midwest, and the Northeast regions of the USA.

Summary

In summary, in this study of teens in highly competitive schools, the purpose was to examine the potential unique effects of five dimensions associated with ongoing pressures to achieve: feelings of envy, comparisons on social media, negative feedback from others, support from friends, and overall time pressures. Also examined were two variables that might have been confounds in any associations found for the five constructs of central interest, i.e., time spent on social media and attachment to parents. All analyses were conducted separately for boys and girls, in line with a prior work on HAS youth showing that associations involving risk and protective effects can differ considerably by gender (Luthar & Kumar, 2018).

Methods

Participants

The study used data from three different high-achieving private school cohorts: School A (Southwest), School B (Midwest), and School C (Northeast). Students were all from grades 9 through 12. Among those who were eligible to participate in the survey, a total of 1608 students participated—i.e., 461 from School A, 724 from School B, and 423 from School C, representing participation rates of 95%, 95%, and 97%, respectively. Of the total *n*, 1075 participants responded to all questionnaires for the measures used in this study.

The schools were all considered high-achieving given average SAT scores ranging from 1290 to 1360 (90th–95th

percentile) and over 17 AP course offerings on average. Across three schools, the average age of the participants was 15.96 years ($SD = 1.26$); 52% were boys; 52% were enrolled in grades 11 and 12, while the rest were in grades 9 and 10. Seventy percent identified themselves as Caucasian; 9% and 7% were Asian American and African American, respectively. The majority of the participants had two married parents (82%); 86% of fathers and 90% of mothers had a college degree or higher. Eighty-six percent of fathers and 53% of mothers worked more than 20 h per week; 7% of fathers and 16% of mothers worked less than 20 h. Annual school tuition rates were approximately \$25,000 for school A, \$17,000 for school B, and \$30,000 for school C.

Data in this study are from a larger packet of questionnaires administered by all school officials as part of ongoing initiatives on positive youth development. Students and their parents had the option to decline participation. Participating students completed the survey on computers during regular classroom time. No identifying information of study participants were collected; analyses presented here are based on entirely anonymous, de-identified data.

Measures

Social comparisons on online platforms were measured by four items asking how participants feel after viewing other people's social media accounts. Items included statements such as "Your life is not as exciting as others" and "You are not as happy as others." Cronbach's α s across genders and schools ranged from .79 to .87, with a median of .80. In the interest of brevity, this variable is referred to as SM-social comparisons from here on.

Envy was measured by asking the extent to which participants would feel envious toward friends doing better than them in looks, popularity, sports, and wealth (Lyman & Luthar, 2014). Six Cronbach's α s across both genders and all schools ranged from .92 to .94, with a median of .93.

Time spent on social media (henceforth referred to as SM-time spent) was measured by asking "On a typical day, how much time do you spend" on each of the following six social media platforms: (1) *Snapchat*, (2) *Facebook*, (3) *Instagram*, (4) *Twitter*, (5) *YouTube*, and (6) *Online forums or chatrooms* (e.g., *Reddit*, *blogs*). Responses were rated as 0 = *I do not use*, 1 = *less than 30 min*, 2 = *30 min*, 3 = *1 h*, 4 = *2 h*, 5 = *3 h*, 6 = *4 h*, and 7 = *5 or more hours*. Averages were computed for time spent across these various platforms (as many could, potentially, have been accessed simultaneously during the same time period). Cronbach's α s across genders and schools ranged from .75 to .85, with a median of .81.

Negative feedback on social media (SM-negative feedback) was assessed by two questions, each with a 5-point response scale, and the second with three items subsumed. These were "How often do people say mean things

to you or about you on social media?" and "How often do you get negative reactions to messages or pictures that you posted on social network sites (on your own profile or on another's profile) from (a) good friends, (b) people you don't know very well, and (c) people you know but are not friends?" Cronbach's α s across genders and schools ranged from .89 to .94, with a median of .91.

Support from friends was measured by the Network of Relationships Inventory (NRI; Furman & Buhrmester, 1985). For this study, seven subscales (21 items) assessing positive dimensions of relationships with a close friend were included, e.g., companionship, intimacy, and admiration. Examples include "How much does [your close friend] have a strong feeling of affection (loving or liking) toward you?" and "How much does this person like or approve of the things you do?" Cronbach's α s across genders and schools ranged from .93 to .94, with a median of .94.

To assess *time pressure*, participants were asked to indicate the degree to which they felt pressure related to time constraints, e.g., because of "too many assignments" and "too many exams and tests." Cronbach's α s across genders and schools ranged from .86 to .91, with a median of .89.

Adolescents' *attachment with their parents/caregivers* was measured by the revised version of Inventory of Parent and Peer Attachment (IPPA; Greenberg & Armsden, 2009). This measure includes 50 items assessing three subscales: *trust* (e.g., "My mother/father respects my feelings"); *communication* (e.g., "I tell my mother/father about my problems and troubles"); and *alienation* (reverse coded, e.g., "I get upset a lot more than my mother knows about"). Cronbach's α s for attachment with mother (25 items), across genders and schools, ranged from .91 to .95, median .93; for attachment with father (25 items), Cronbach's α s ranged from .91 to .95, median .93.

Finally, *adjustment outcomes* were measured by the Youth Self-Report (YSR; Achenbach & Rescorla, 2001) subscales of Anxious-depressed, Withdrawn-depressed, Somatic symptoms and Rule-breaking behavior. Cronbach's α s for the four subscales across genders and schools were as follows: .87–.89 for Anxious-depressed, median .89; .80–.83, for Withdrawn-depressed, median .82; .79–.86 for Somatic, median .83; and .76–.87 for Rule-breaking behaviors median .84.

Statistical Analysis

Considering each of the four YSR subscales as outcomes in turn, central analyses entailed six multivariate regressions (i.e., separate analyses for 2 gender groups in 3 schools). The regression model included all 8 predictor variables: Envy, SM-social comparisons, SM-negative

feedback, Friend support, Time pressure, SM-time spent, Dad attachment, and Mom attachment. All analyses were run using SPSS version 25 (IBM Corp, 2017). Any missing values in the variables were treated with the list-wise deletion method.

Results

Descriptive Analyses and Correlations

Means and standard deviations of all variables and maladjustment indicators are shown in Table 1, separately by gender and school. On average, scores on SM-negative feedback were higher among boys than among girls, while those on SM-social comparisons were higher among girls. With regard to maladjustment problems, Anxious-depressed and Somatic symptoms were higher among girls than among boys, whereas the opposite was true for Rule-breaking behaviors.

Correlations among all variables, for all schools and both boys and girls, are shown in Tables 2, 3, and 4. These values were much as would be expected, with each of the predictor variables showing significant links with at least one (and some, with most) of the four adjustment outcomes. The only notable exception was Closeness to friends, where few coefficients were significant.

Multivariate Regression Analyses

As indicated earlier, of central interest in the multiple regressions were associations that recurrently were found to be significant, across the six different subgroups defined by gender and school. In the model with *Anxious-depressed* symptoms as the outcome (see Table 5), SM-social comparisons was the most robust indicator across all six subgroups, with moderate effect sizes ($0.28 \leq \beta_s \leq 0.37$, median 0.32). The second most common association was found between Dad attachment and symptoms ($-0.28 \leq \beta_s \leq -0.19$, median -0.20). The remaining

Table 1 Descriptive statistics: Means and standard deviations of social media (SM) dimensions and other variables, variables by school and gender D

Variable	School A (Southwest)				School B (Midwest)				School C (Northeast)				School		Sex	
	Boys (n = 235)		Girls (n = 226)		Boys (n = 377)		Girls (n = 347)		Boys (n = 219)		Girls (n = 204)		F	η^2	F	η^2
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD				
Envy	1.82	0.46	0.92	0.48	1.69	0.47	1.88	0.48	1.62	0.49	1.81	0.47	550.02***	0.41	25.22***	0.02
SM-social comparisons	5.15	4.27	8.02	4.49	4.67	4.07	8.01	4.10	4.16	4.23	6.94	4.42	6.45**	0.08	204.47***	0.12
SM-negative feedback	1.89	2.64	1.36	2.10	1.66	2.46	1.06	1.80	1.59	2.64	1.26	2.07	1.68		19.48***	0.01
SM-average time spent	1.68	1.04	1.67	0.91	1.65	0.86	1.64	0.85	1.46	1.00	1.31	0.65	13.90***	0.02	1.06	
Time pressure	3.71	0.95	4.11	0.84	3.45	1.05	3.86	0.94	3.47	1.14	3.89	0.95	9.80***	0.01	68.53***	0.04
Total friend support	3.30	0.73	3.90	0.70	3.32	0.70	3.81	0.68	3.26	0.77	3.77	0.72	1.54		215.93 ***	0.12
Mom attachment	95.66	16.77	98.89	19.80	98.88	16.13	97.93	19.31	99.67	16.9	99.32	21.18	1.45		0.17	
Dad attachment	92.41	17.01	93.28	19.47	95.09	16.96	91.88	20.28	96.09	18.89	94.34	22.36	1.63		2.71	
Anxious-depressed symptoms	6.35	5.18	10.46	6.23	5.27	5.14	7.41	5.37	4.93	5.28	7.88	5.88	21.37***	0.03	107.36***	0.07
T-score	60.01		67.95		58.12		62.01		57.51		62.91					
Withdrawn-depressed symptoms	4.04	3.37	4.85	3.52	3.77	3.47	3.58	3.22	3.44	3.34	4.03	3.50	7.70***	0.01	3.12	
T-score	58.07		60.16		57.47		56.86		56.66		58.11					
Somatic symptoms	3.35	3.59	5.95	4.77	2.61	3.40	3.89	3.68	2.26	3.52	3.47	3.83	26.92***	0.03	71.28***	0.05
T-score	57.29		64.10		55.53		58.64		54.71		57.68					
Rule-breaking behaviors	5.05	4.56	4.74	4.39	4.55	4.39	3.51	3.36	4.68	4.71	3.61	3.33	5.94**	0.01	15.15***	0.10
T-score	56.17		55.76		55.33		53.61		55.64		53.82					

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 2 Simple correlations among variables: School A (Southwest)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Envy	-	0.46**	0.32**	0.24**	0.29**	0.05	-0.20**	-0.21**	0.37**	0.18**	0.23**	0.24**
2. SM-social comparisons	0.39**	-	0.24**	0.25**	0.27**	-0.03	-0.29**	-0.32**	0.52**	0.38**	0.31**	0.33**
3. SM-negative feedback	0.29**	0.26**	-	0.41**	0.14*	-0.17*	-0.18*	-0.21**	0.29**	0.24**	0.31**	0.42**
4. SM-average time spent	0.32**	0.15*	0.38**	-	0.03	-0.02	-0.22**	-0.30**	0.19**	0.22**	0.21**	0.40**
5. Time pressure	0.25**	0.08	0.18**	0.13	-	0.11	-0.17*	-0.12	0.29**	0.17*	0.29**	0.17*
6. Total friend support	-0.02	0.02	0.07	0.12	0.08	-	0.11	0.11	-0.11	-0.21**	0.01	-0.04
7. Mom attachment	-0.22**	-0.20**	-0.12	-0.21**	0.05	0.17*	-	0.58**	-0.41**	-0.47**	-0.36**	-0.43**
8. Dad attachment	0.20**	-0.19**	-0.12	-0.12	-0.09	0.26**	0.72**	-	-0.32**	-0.33**	-0.32**	-0.45**
9. Anxious-depressed symptoms	0.35**	0.39**	0.28**	0.24**	0.11	-0.06	-0.34**	-0.37**	-	0.73**	0.68**	0.41**
10. Withdrawn-depressed symptoms	0.13	0.21**	0.20**	0.20**	0.07	-0.12	-0.40**	-0.47**	0.69**	-	0.61**	0.46**
11. Somatic symptoms	0.32**	0.14*	0.30**	0.30**	0.16*	0.10	-0.23**	-0.25**	0.65**	0.55**	-	0.50**
12. Rule-breaking behaviors	0.30**	0.15*	0.34**	0.44**	0.10	0.00	-0.42**	-0.41**	0.51**	0.54**	0.60**	-

* $p < 0.05$; ** $p < 0.01$; correlations for boys are at the lower left corner; correlations for girls are at the upper right corner

variables showed more sporadic links. Altogether, the 8 independent variables explained 29–44% of the total variance.

With *Withdrawn-depressed* symptoms as the outcome, results again showed that associations between SM-social comparisons were most pronounced across all subgroups ($0.18 \leq \beta_s \leq 0.35$, median 0.26; see Table 5). Additionally, Mom attachment had a significant, negative association with these symptoms in four out of six subgroups ($-0.34 \leq \beta_s \leq -0.19$, median -0.22), whereas Dad attachment was significant only among boys ($\beta_s = -0.34, -0.21$, and -0.31 for boys in Schools A, B, and C, respectively).

In relation to *Somatic* symptoms, regression analyses showed significant effects for SM-negative feedback in

five of the six subgroups ($0.14 \leq \beta_s \leq 0.33$, median 0.19; see Table 6); the exception was boys in school A. Additionally, Time pressure was significant in four out of six subgroups ($0.10 \leq \beta_s \leq 0.18$, median 0.15). Across all models predicting to Somatic symptoms, the total variance explained ranged from 14 to 33%.

Finally, with *Rule-breaking* behaviors as the outcome, links involving SM-time spent were significant in four of the six analyses ($0.13 \leq \beta_s \leq 0.34$, median 0.19) and were of borderline significance in a fifth ($\beta = 0.12, p < 0.10$). Coefficients for SM-negative feedback were significant in three cases and trending toward borderline significance ($p < 0.10$) in the other three groups ($0.14 \leq \beta_s \leq 0.23$, median 0.16). Also seen were links

Table 3 Simple correlations among variables: School B (Midwest)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Envy	-	0.50**	0.21**	0.08	0.28**	0.01	-0.17**	-0.15**	0.35**	0.19**	0.23**	0.26**
2. SM-social comparisons	0.47**	-	0.21**	0.16**	0.25**	-0.05	-0.27**	-0.20**	0.49**	0.33**	0.30**	0.23**
3. SM-negative feedback	0.32**	0.36**	-	0.13*	0.03	0.02	-0.13*	-0.12*	0.22**	0.11*	0.22**	0.31**
4. SM-average time spent	0.19**	0.31**	0.38**	-	0.05	-0.01	-0.06	-0.12*	0.10	0.12*	0.06	0.15**
5. Time pressure	0.23**	0.23**	0.11*	0.09	-	0.07	-0.06	-0.06	0.23**	0.23**	0.24**	0.10
6. Total friend support	-0.03	0.02	-0.04	0.08	0.04	-	0.07	0.12*	-0.10	-0.18**	-0.01	0.03
7. Mom attachment	-0.13*	-0.25**	-0.06	-0.16**	-0.20**	0.10	-	0.67**	-0.32**	-0.34**	-0.23**	-0.29**
8. Dad attachment	-0.19**	-0.33**	-0.12*	-0.16**	-0.19**	0.08	0.68**	-	-0.33**	-0.31**	-0.21**	-0.31**
9. Anxious-depressed symptoms	0.39**	0.52**	0.32**	0.21**	0.22**	0.05	-0.35**	-0.40**	-	0.71**	0.67**	0.44**
10. Withdrawn-depressed symptoms	0.26**	0.45**	0.24**	0.15	0.17**	-0.01	-0.43**	-0.46**	0.79**	-	0.55**	0.33**
11. Somatic symptoms	0.28**	0.39**	0.32**	0.26**	0.22**	0.14*	-0.27**	-0.36**	0.73**	0.61**	-	0.49**
12. Rule-breaking behaviors	0.35**	0.30**	0.33**	0.33**	0.19**	0.14**	-0.32**	-0.42**	0.54**	0.49**	0.62**	-

* $p < 0.05$; ** $p < 0.01$; correlations for boys are at the lower left corner; correlations for girls are at the upper right corner

Table 4 Simple correlations among variables: School C (Northeast)

	1	2	3	4	5	6	7	8	9	10	11	12
1. Envy	-	0.58**	0.20**	0.18*	0.34**	0.02	0.33**	-0.25**	0.48**	0.30**	0.34**	0.28**
2. SM-social comparisons	0.34**	-	0.20**	0.17*	0.26**	-0.03	-0.31**	-0.34**	0.54**	0.48**	0.36**	0.20**
3. SM-negative feedback	0.14*	0.25**	-	0.05	0.00	-0.06	-0.12	-0.04	0.17*	0.16*	0.23**	0.19**
4. SM-average time spent	0.02	0.19**	0.44**	-	0.15*	0.12	-0.04	-0.10	0.11	0.09	0.18*	0.21**
5. Time pressure	0.25**	0.25**	0.08	0.03	-	0.00	-0.26**	-0.20**	0.36**	0.33**	0.36**	0.23**
6. Total friend support	-0.03	0.00	0.00	0.21**	0.08	-	0.14	0.04	0.04	-0.12	-0.01	0.11
7. Mom attachment	-0.15*	-0.21**	-0.23**	-0.14*	-0.13	0.24**	-	0.65**	-0.37**	-0.44**	-0.39**	-0.36**
8. Dad attachment	-0.14	-0.31**	-0.20**	-0.09	-0.10	0.24**	0.79**	-	-0.41**	-0.41**	-0.33**	-0.31**
9. Anxious-depressed symptoms	0.17*	0.42**	0.35**	0.32**	0.21**	0.09	-0.34**	-0.40**	-	0.74**	0.55**	0.33**
10. Withdrawn-depressed symptoms	0.13	0.36**	0.29**	0.23**	0.21**	0.04	-0.36**	-0.40**	0.80**	-	0.65**	0.44**
11. Somatic symptoms	0.03	0.22**	0.34**	0.37**	0.18**	0.11	-0.22**	-0.26**	0.69**	0.69**	-	0.44**
12. Rule-breaking behaviors	0.06	0.22**	0.30**	0.50**	0.11	0.14*	-0.27**	-0.20**	0.52**	0.53**	0.60**	-

* $p < 0.05$; ** $p < 0.01$; correlations for boys are at the lower left corner; correlations for girls are at the upper right corner

for attachment to parents. Dad attachment had significant inverse associations in four out of six subgroups ($-0.31 \leq \beta_s \leq -0.19$, median -0.21), while Mom attachment was significant in three cases ($\beta_s = -0.24$ among

boys in school A; $\beta_s = -0.26$ and -0.24 among girls in Schools A and C, respectively). The total variance explained in each model ranged from 19 to 36% considering all 8 independent variables.

Table 5 Regression analysis prediction to anxious-depressed symptoms, by school and gender

Outcome/predictors	School A—Southwest		School B—Midwest		School—Northeast	
	Boys	Girls	Boys	Girls	Boys	Girls
Anxious-depressed symptoms						
Envy	0.09	0.12 [^]	0.12*	0.10 [^]	-0.02	0.21**
SM-social comparisons	0.31***	0.33***	0.35***	0.37***	0.28***	0.31***
SM-negative feedback	0.04	0.08	0.10 [^]	0.16**	0.32***	0.08
SM-average time spent	0.01	-0.05	0.00	-0.04	-0.03	-0.06
Time pressure	0.03	0.07	0.04	0.08	0.10	0.13*
Friend support	0.01	-0.10	0.08	-0.04	0.13*	0.06
Mom attachment	-0.16	-0.25**	-0.09	-0.04	-0.04	-0.06
Dad attachment	-0.17 [^]	-0.03	-0.19**	-0.21**	-0.28**	-0.19*
Total R^2	0.29	0.36	0.38	0.38	0.44	0.43
Withdrawn-depressed symptoms						
Envy	-0.12	-0.03	-0.01	-0.02	-0.10	-0.09
SM-social comparisons	0.18*	0.25**	0.35***	0.21**	0.26***	0.32***
SM-negative feedback	0.06	0.06	0.07	0.05	0.28***	0.09
SM-average time spent	0.02	0.03	-0.04	0.04	-0.06	0.01
Time pressure	0.03	0.01	-0.01	0.15**	0.15*	0.15*
Friend support	-0.05	-0.16*	0.02	-0.16**	0.13 [^]	-0.07
Mom attachment	-0.14	-0.34***	-0.20**	-0.19**	-0.04	-0.24**
Dad attachment	-0.34**	-0.05	-0.21**	-0.12 [^]	-0.31**	-0.14
Total R^2	0.27	0.29	0.36	0.25	0.40	0.37

SM social media; [^] $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 6 Regression analysis prediction to somatic symptoms and rule-breaking behaviors, by school and gender

Outcome/predictors	School A—Southwest		School B—Midwest		School—Northeast	
	Boys	Girls	Boys	Girls	Boys	Girls
Somatic symptoms						
Envy	0.17*	0.00	0.03	0.01	−0.05	0.03
SM-social comparisons	0.02	0.13	0.21**	0.19**	0.12	0.16^
SM-negative feedback	0.03	0.15*	0.14*	0.19**	0.33***	0.19**
SM-average time spent	0.05	−0.02	0.03	−0.07	0.12	0.03
Time pressure	0.05	0.13^	0.10*	0.14**	0.16*	0.18*
Friend support	0.12	0.00	0.19***	−0.03	0.10	0.04
Mom attachment	−0.08	−0.22*	−0.06	−0.09	0.00	−0.26**
Dad attachment	−0.19^	−0.14	−0.21**	−0.09	−0.19^	−0.04
Total R^2	0.14	0.24	0.26	0.18	0.33	0.30
Rule-breaking behaviors						
Envy	0.10	−0.01	0.23***	0.14*	−0.05	0.10
SM-social comparisons	−0.02	0.12	−0.01	0.07	0.14*	−0.07
SM-negative feedback	0.13^	0.23***	0.14**	0.16**	0.14^	0.14^
SM-average time spent	0.20**	0.12^	0.13*	0.06	0.34***	0.18*
Time pressure	−0.01	−0.05	0.04	0.00	0.13*	0.10
Friend support	0.09	0.06	0.19***	0.04	0.12^	0.11
Mom attachment	−0.24*	−0.26**	−0.06	−0.10	−0.13	−0.24*
Dad attachment	−0.21*	−0.19*	−0.31***	−0.20**	−0.03	−0.10
Total R^2	0.30	0.35	0.32	0.19	0.36	0.23

SM social media; ^ $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Discussion

The single most striking finding from this study was the recurrent, pronounced links between SM-social comparisons and the two internalizing symptoms—i.e., Anxious-depressed and Withdrawn-depressed—in all 6 subgroups (i.e., boys and girls at each of the 3 private school samples from different parts of the country). These associations had robust effect sizes across the regression models. In addition, SM-negative feedback showed multiple links with Somatic symptoms and Rule-breaking behaviors; average SM-time spent also had statistically significant relationships with Rule-breaking behaviors.

Social Comparisons as a Vulnerability Process

Consistent with past studies that examined the detrimental effect of social media (Fox & Moreland, 2015; Vogel et al., 2014), social comparisons showed consistent links with distress indices in the present HAS samples, with moderate effect sizes. Associations between SM-social comparisons and internalizing symptoms remained significant even after accounting for additional variables related

to relationships with parents and peers (i.e., $0.28 \leq \beta_s \leq 0.37$ for anxious-depressed symptoms; $0.18 \leq \beta_s \leq 0.35$ for withdrawn-depressed symptoms). This corroborates suggestions that pervasive social comparisons can be pernicious for adolescents in high-achieving communities not only in real life, but also on social media platforms (Luthar et al., 2019).

Of course, one could argue that the links are equally likely in the reverse direction—i.e., students who are anxious or depressed are more prone to feel inferior to others after seeing the appealing profiles on social media (Pera, 2018). At the same time, similar logic could be extended to other independent variables, such that distressed students could also consistently show envy of others, see others' feedback as more negative on social media, and feel more alienated from parents. However, none of these variables showed consistent, robust associations with the two indicators for the internalizing symptoms in the study.

Given the robustness of these findings across multiple cohorts and their relative effect sizes, it seems safe to assume that comparisons with others are likely to be inimical for the adjustment of children in HAS contexts. As implicated in the “Big Fish Little Pond Effect” (Fang et al., 2018), repeated

social comparisons are likely to be particularly damaging in settings where personal achievement is both highly valued and demonstrated by the majority. The destructiveness of such comparisons is highlighted in results of a multinational cross-sectional study (Rathmann, Bilz, Hurrelmann, Kiess, & Richter, 2018), where poor psychosomatic health (e.g., difficulty falling asleep and physical pain) was evident when students (particularly those with lower school performance) attended classes with a large group of others with better school performance. The authors attributed this finding to ongoing comparisons within an environment that fosters comparisons with the reference group that is “better off.” They went as far as suggesting that perhaps teachers and school administrators should consider placing students in groups where levels of school performance are relatively heterogeneous.

From the perspective of future preventions, the findings are important given that anxiety and depression are problem domains in which HAS students are particularly vulnerable. Relevant, for example, are findings from a recent report comparing rates of clinically significant levels of symptoms among HAS students, with those in national normative samples (Luthar, Kumar, & Zillmer, 2020). Considering both anxious-depressed and withdrawn-depressed symptoms among multiple cohorts of HAS boys and girls, the relative risk ratios, with median values in parentheses, were 4 to 10 times greater than norms among boys (median of 7) and 6 to 14 times greater than norms for girls (median of almost 8). Elevations were less pronounced in externalizing domains, with HAS rates on rule-breaking behavior, for example, being 2 to 7 those in norms among boys (median of 4) and for girls, less than 1 to 3 (median 2). In HAS settings, marked elevations on these particular internalizing dimensions make conceptual sense. Anxiety is heightened when pressures for achievement are chronically high, as depression is exacerbated at perceived failures at meeting high standards across multiple spheres (Luthar et al., 2020).

Although descriptive findings in the present study showed higher average levels of SM-social comparisons among girls, it is important to note that the links between this variable and outcomes were strong for both boys and girls in all three schools. These findings are incongruent with prior findings that reported gender differences in problems associated with social media—in which females had higher rates of depression in relation to social media use (Lin et al., 2016), and higher social media addiction than males (Hawi & Samaha, 2017). Findings of moderate effect sizes associated with SM-social comparisons among boys in this study indicate that the problem likely generalizes across both genders in HAS settings.

SM Comparisons and Other Overlapping Variables: Envy and Time Spent

Another noteworthy finding on social comparisons was that it shared much more unique variance with internalizing symptoms than another construct with which it conceptually overlaps, that is, envy. In simple correlations, associations between envy and distress indices, as well as those between envy and social comparisons, were generally statistically significant. Yet in multivariate analyses, it was only social comparisons that was significant in relation to both sets of symptoms.

These findings are conceptually important because the construct of envy has connotations that are different than social comparisons. Envy subsumes not just a sense of inferiority, but also a sense of ill will toward others (Smith & Kim, 2007). Our findings suggest that in terms of ramifications for their internalizing symptoms, what appears to be more critical for distress is HAS students’ feeling inferior to others, as in social comparisons, rather than necessarily active resentment of those doing better than themselves. This distinction is important for any future theoretical conceptualizations of the nature of positive and negative peer group processes in HAS settings.

A third important finding around social comparisons on social media was, again, in relation to another construct with which it overlaps, and also was found to be not uniquely associated with internalizing outcomes, and that was SM-time spent on social media. There have been many suggestions that too much time spent on social media is what is causing this generation of children to become depressed and anxious, probably because they are not spending enough in-person time with close others (Twenge et al., 2018). Across these internalizing outcomes as well as somatic symptoms, SM-time spent showed few significant links.

By contrast, SM-time spent did show several links with rule-breaking behavior in this study, across these HAS cohorts. With regard to underlying mechanisms, it is possible that high peer connectedness via social media can promote some counter-conventional, externalizing behaviors, including substance use (see Luthar et al., 2019). Adolescents may often see these behaviors online within peer groups, especially on social media applications like Twitter and Instagram, which are the two single most frequently used platforms among teens. As online and offline environments often share characteristics (Odgers & Jensen, 2020), teens’ perception of risky behaviors as the means to potentially bring higher status in the peer group may occur when they are frequently exposed to such behaviors on social media. It would be useful to further explore associations involving these constructs in future research, along with potential underlying mechanisms.

SM-Negative Feedback

In this study, negative feedback from others on social media showed multiple links with somatic symptoms. Prior research on cyberbullying shows that online victimization contributes to physical symptoms, as well as psychological distress (Albdour, Hong, Lewin, & Yarandi, 2019). Similarly, Szabo, Ward, and Fletcher (2019) stated that ways in which stressors are appraised can matter for psychopathology. When they are perceived as “threats,” this contributes to increased somatic symptoms, but when they are perceived as “challenges”—accompanied by interpersonal and informational coping—somatic symptoms are lowered. In the present study, harsh feedback from others on social media may have been perceived as threatening, specifically, in relation to social standing or self-esteem, thus possibly elevating somatic symptoms. (Similar explanations might underlie links between overall feelings of time pressure in this study; this construct was associated only with somatic symptoms in this study.)

Negative feedback on social media also showed several associations with rule-breaking behaviors. Again, feelings of rejection could lead to heightened acting-out and aggression (DeWall & Bushman, 2011). Thus, those who received condescending or derogatory comments from others online may have, in some instances, reacted with anger or frustration that was manifested in externalizing, rule-breaking behaviors.

At the same time, bidirectionality is possible, as well, such that teens who were already acting out or aggressive received more negative comments from others on social media. Several studies have shown links between externalizing behaviors and high impulsivity traits (Beauchaine, Zisner, & Sauder, 2017; Johnson, Tharp, Peckham, Carver, & Haase, 2017) and sensitivity to social rejection (Gao, Assink, Liu, Chan, & Ip, 2019). Furthermore, individuals who are more sensitive to rejection are also more likely to behave aggressively, and therefore, be victimized. Adolescents with externalizing symptoms may already have some trait impulsivity, which could lead to negative interactions with others in their everyday lives (online and in person), leading, in turn, to receiving more frequent negative feedback on social media.

Attachment to Parents and Friend Support

Three variables included here could have represented compensatory effects (i.e., main effects in regressions)—attachment to mothers and fathers, and support from friends—and findings showed associations for the former two. In multivariate regressions, attachment to either mother or father was significantly associated with at least one of the four outcome variables, across all subgroups in the study. These findings are consistent with a core tenet in resilience research, namely that among children facing various types of life stressors,

closeness to at least one parent can serve critical protective functions (Luthar & Eisenberg, 2017; NASEM, 2019).

Surprisingly, closeness to friends or support from friends showed few associations in this study. This was not apparently due to measurement problems with this construct, as coefficients of internal consistency were high across all subgroups. In future research, it could be useful to consider this construct in relation to outcome variables other than those examined here, within HAS contexts. For example, closeness to friends could be related to positive adjustment outcomes such as prosocial behaviors (Malonda, Llorca, Mesurado, Samper, & Mestre, 2019) more so than to indices of psychopathology.

Implications and Future Directions

In considering interventions to reduce social comparisons in HAS settings, two issues will need attention. First, adults will need to proactively reduce the degree to which these students’ sense of their own self-worth depends on the splendor of their accomplishments, and instead, rests on stable feelings that they are loved for who they are as individuals. As previously noted, feelings of unconditional acceptance from parents are critical for children to thrive in the face of adversity (Luthar & Eisenberg, 2017; Masten & Tellegen, 2012). Additionally, students with low self-esteem are especially vulnerable when they perceive themselves to be inferior to others (on social media sites or in person), regardless of actual levels of relative standing (Cramer, Song, & Drent, 2016).

Second, in the environmental context of high-performing schools, it is important that proactive steps are taken to reduce norms and rituals that tend to exacerbate students’ social comparisons. Examples of these are public announcements of class ranks, and “sweater day” where those who are not accepted by prestigious colleges may feel less than others (Luthar & Kumar, 2018; Luthar et al., 2019). It will be important to include students themselves in designing interventions to reduce unhealthy social comparisons. This can be done by first showing them exactly how pernicious and destructive these comparisons can be for mental health. Additionally, focus groups can be used to help get students’ creative ideas about how this can be addressed in their own school. Luthar et al. (2019) describe, for example, how high school seniors volunteered to talk to middle schoolers about the need to watch out for unhealthy competition and comparisons, which they themselves had become prey to, but had then overcome.

Similar initiatives could be used to address the second salient aspect of social media identified as a vulnerability factor, i.e., negative social feedback. Again, antibullying initiatives—targeting unkindness in-person or online—can be useful, particularly when involving students’ own voices in design and implementation. Examples are seen in significant reduction of antisocial and bullying behaviors followed

by bullying prevention programs (e.g., see Flannery et al., 2016; Olweus & Limber, 2010).

Limitations and Strengths

There were several limitations associated with this work, including the use of cross-sectional data, the reliance on self-reports, and uncertain generalizability of findings. The cross-sectional design precludes any conclusions about causality, i.e., that social media use leads to adjustment problems, or vice versa (Bor, Dean, Najman, & Hayatbakhsh, 2014). Experimental studies (e.g., Hunt, Marx, Lipson, & Young, 2018) could be helpful to investigate any directionality of the relationships among social media and maladjustment variables (Appel, Gerlach, & Crusius, 2016). With regard to reliance on self-reports, retrospective estimates of use can be biased because it is difficult to remember the actual time spent online (Hunt et al., 2018). In the future, other prospective methods of reporting use (such as daily diaries) could help to further illuminate the types of patterns captured here. Finally, it would be useful to examine patterns documented here in schools with varying levels of students' achievement overall, as well as diversity in the demographic characteristics of their families.

Multifaceted measurement of social comparisons could also be useful in future research. There could be differences in ramifications for adjustment, for example, depending on the proximity of relationships with people to whom teens compare themselves, and the types of contents that are viewed (e.g., image vs. text-type platforms; see Pittman & Reich, 2016). Similarly, with regard to negative feedback, study results would be more informative if assessments distinguished between multiple forms of online harassment, ranging from cyberbullying to sexual harassment (Pater, Kim, Mynatt, & Fiesler, 2016).

Finally, future research might examine potential curvilinear links between time spent on social media and adjustment problems, as well as alternative ways to capture what might represent excessive preoccupation. With regard to the former issue, this study yielded limited evidence of linear links with maladjustment. Past work has shown that while overly high use of social media is detrimental, individuals with moderate use tend to have better outcomes than those with no use at all (Twenge et al., 2018; see also Hanley, Watt, & Coventry, 2019). With reference to alternative measurement approaches, future studies might also assess the total number of times that teens look at social media sites per day (e.g., in between school work or extracurriculars)—in operationalizing potentially unhealthy levels of use.

Offsetting the limitations of this study are several strengths. First, it is based on a sample of youth who are still understudied, clearly at risk, and often difficult for developmental researchers to access (Luthar, Barkin, & Crossman, 2013)—students at

selective private schools. The total number of participants was large, i.e., over 1000, and participants were from three HASs, located in different regions of the USA. This study design allowed for determination of associations that were relatively robust, seen recurrently across discrete samples of high-achieving students.

Most importantly, this study is the first to demonstrate strong, consistent links between HAS students' tendencies to compare themselves with peers and their own anxiety and depression, across multiple cohorts. These findings are important in prioritizing targets for preventive interventions, as HAS students are now clearly noted, in science as well as the media, as being a group at high risk for these problems, as well as serious self-harm (Aubrey & Greenhalgh, 2018, Denizet-Lewis, 2017; Geisz & Nakashian, 2018, Luthar et al., 2019; NASEM, 2019). In addition, findings here suggest that this construct is actually far more consistently linked with anxiety and depression than one that is widely believed to be a culprit, i.e., amount of time spent on social media use (at least in HAS settings). These cumulative findings imply the importance of collaborative efforts among adult stakeholders (parents and educators) with involvement of students themselves, to mitigate unhealthy social comparisons in school settings that are already rife with high levels of everyday stress and pressure.

Acknowledgments The authors gratefully acknowledge support provided by Authentic Connections.

References

- Achenbach, T. M., & Rescorla, L. (2001). Manual for the ASEBA school-age forms & profiles: an integrated system of multi-informant assessment. Burlington, VT.
- Albdour, M., Hong, J. S., Lewin, L., & Yarandi, H. (2019). The impact of cyberbullying on physical and psychological health of Arab American adolescents. *Journal of Immigrant and Minority Health, 21*(4), 706–715.
- Appel, H., Gerlach, A. L., & Crusius, J. (2016). The interplay between Facebook use, social comparison, envy, and depression. *Current Opinion in Psychology, 9*, 44–49. <https://doi.org/10.1016/j.copsyc.2015.10.006>.
- Aubrey, A., & Greenhalgh, J. (2018). The perils of pushing kids too hard, and how parents can learn to back off. NPR. Retrieved from <https://www.npr.org/sections/health-shots/2018/06/11/616900580/back-off-how-to-get-out-of-the-high-pressure-parenting-trap>.
- Barry, C. T., Sidoti, C. L., Briggs, S. M., Reiter, S. R., & Lindsey, R. A. (2017). Adolescent social media use and mental health from adolescent and parent perspectives. *Journal of Adolescence, 61*, 1–11. <https://doi.org/10.1016/j.adolescence.2017.08.005>.
- Beauchaine, T. P., Zisner, A. R., & Sauder, C. L. (2017). Trait impulsivity and the externalizing spectrum. *Annual Review of Clinical Psychology, 13*(1), 343–368. <https://doi.org/10.1146/annurev-clinpsy-021815-093253>.
- Becker, M., & Neumann, M. (2018). Longitudinal big-fish-little-pond effects on academic self-concept development during the transition from elementary to secondary schooling. *Journal of Educational Psychology, 110*(6), 882–897. <https://doi.org/10.1037/edu0000233>.

- Bor, W., Dean, A. J., Najman, J., & Hayatbakhsh, R. (2014). Are child and adolescent mental health problems increasing in the 21st century? A systematic review. *Australian & New Zealand Journal of Psychiatry*, 48(7), 606–616. <https://doi.org/10.1177/0004867414533834>.
- Burrow, A. L., & Rainone, N. (2017). How many likes did I get?: purpose moderates links between positive social media feedback and self-esteem. *Journal of Experimental Social Psychology*, 69, 232–236. <https://doi.org/10.1016/j.jesp.2016.09.005>.
- Cramer, E. M., Song, H., & Drent, A. M. (2016). Social comparison on Facebook: motivation, affective consequences, self-esteem, and Facebook fatigue. *Computers in Human Behavior*, 64(C), 739–746. <https://doi.org/10.1016/j.chb.2016.07.049>.
- Denizet-Lewis, B. (2017). Why are more American teenagers than ever suffering from severe anxiety? *New York Times Magazine*. Retrieved from <https://www.nytimes.com/2017/10/11/magazine/why-are-more-american-teenagers-than-ever-suffering-from-severe-anxiety.html?mwrsm=Facebook&r=0>.
- DeWall, C. N., & Bushman, B. J. (2011). Social acceptance and rejection: the sweet and the bitter. *Current Directions in Psychological Science*, 20(4), 256–260.
- Fang, J., Huang, X., Zhang, M., Huang, F., Li, Z., & Yuan, Q. (2018). The big-fish-little-pond effect on academic self-concept: a meta-analysis. *Frontiers in Psychology*, 9, 1569–1569. <https://doi.org/10.3389/fpsyg.2018.01569>.
- Fardouly, J., & Vartanian, L. R. (2015). Negative comparisons about one's appearance mediate the relationship between Facebook usage and body image concerns. *Body Image*, 12, 82–88. <https://doi.org/10.1016/j.bodyim.2014.10.004>.
- Flannery, D. J., Todres, J., Bradshaw, C. P., Amar, A. F., Graham, S., Hatzenbuehler, M., ... & Le Menestrel, S. M. (2016). Bullying prevention: a summary of the report of the National Academies of Sciences, Engineering, and Medicine. *Prevention Science*, 17(8), 1044–1053. doi:<https://doi.org/10.1007/s1121-016-0722-8>.
- Fox, J., & Moreland, J. J. (2015). The dark side of social networking sites: an exploration of the relational and psychological stressors associated with Facebook use and affordances. *Computers in Human Behavior*, 45, 168–176.
- Furman, W., & Buhrmester, D. (1985). Children's perceptions of the qualities of sibling relationships. *Child Development*, 56(2), 448–461. <https://doi.org/10.2307/1129733>.
- Gao, S., Assink, M., Liu, T., Chan, K. L., & Ip, P. (2019). Associations between rejection sensitivity, aggression, and victimization: a meta-analytic review. *Trauma, Violence, & Abuse*, 1–11. <https://doi.org/10.1177/1524838019833005>.
- Geisz, M. B., & Nakashian, M. (2018). Adolescent wellness: current perspectives and future opportunities in research, policy, and practice. Unpublished report, Robert Wood Johnson Foundation. Retrieved from <https://www.rwjf.org/en/library/research/2018/06/inspiring-and-powering-the-future%2D%2Da-new-view-of-adolescence.html>
- Correse, A., & Ruggieri, R. (2012). Peer attachment: a meta-analytic review of gender and age differences and associations with parent attachment. *Journal of Youth and Adolescence*, 41(5), 650–672. <https://doi.org/10.1007/s10964-012-9759-6>.
- Greenberg, M. T., & Arnsden, G. (2009). Inventory of parent and peer attachment (IPPA). Prevention Research Center.
- Hanley, S. M., Watt, S. E., & Coventry, W. (2019). Taking a break: the effect of taking a vacation from Facebook and Instagram on subjective well-being. *PLoS One*, 14(6), e0217743–e0217743. <https://doi.org/10.1371/journal.pone.0217743>.
- Hawi, N. S., & Samaha, M. (2017). The relations among social media addiction, self-esteem, and life satisfaction in university students. *Social Science Computer Review*, 35(5), 576–586. <https://doi.org/10.1177/0894439316660340>.
- Hunt, M. G., Marx, R., Lipson, C., & Young, J. (2018). No more FOMO: limiting social media decreases loneliness and depression. *Journal of Social and Clinical Psychology*, 37(10), 751–768. <https://doi.org/10.1521/jsep.2018.37.10.751>.
- IBM Corp. (2017). *IBM SPSS Statistics for Windows, version 25.0*. Armonk, NY: IBM Corp.
- Johnson, S. L., Tharp, J. A., Peckham, A. D., Carver, C. S., & Haase, C. M. (2017). A path model of different forms of impulsivity with externalizing and internalizing psychopathology: towards greater specificity. *British Journal of Clinical Psychology*, 56(3), 235–252. <https://doi.org/10.1111/bjc.12135>.
- Kawabata, Y., & Tseng, W. L. (2019). Relational and physical victimization, friendship, and social and school adjustment in Taiwan. *Journal of Social and Personal Relationships*, 36(6), 1559–1578. <https://doi.org/10.1177/0265407518767771>.
- Li, C., Sun, Y., Ho, M. Y., You, J., Shaver, P. R., & Wang, Z. (2016). State narcissism and aggression: the mediating roles of anger and hostile attributional bias. *Aggressive Behavior*, 42(4), 333–345. <https://doi.org/10.1002/ab.21629>.
- Lin, L. Y., Sidani, J. E., Shensa, A., Radovic, A., Miller, E., Colditz, J. B., Hoffiman, B. L., Giles, L. M., & Primack, B. A. (2016). Association between social media use and depression among U.S. young adults. *Depression and Anxiety*, 33(4), 323–331. <https://doi.org/10.1002/da.22466>.
- Luthar, S. S., Barkin, S. H., & Crossman, E. J. (2013). “I can, therefore I must”: fragility in the upper-middle classes. *Development and Psychopathology*, 25(4pt2), 1529–1549.
- Luthar, S. S., & Cicciolla, L. (2015). Who mothers mommy? Factors that contribute to mothers' well-being. *Developmental Psychology*, 51(12), 1812–1823. <https://doi.org/10.1037/dev0000051>.
- Luthar, S. S., & Eisenberg, N. (2017). Resilient adaptation among at-risk children: harnessing science toward maximizing salutary environments. *Child Development*, 88(2), 337–349. <https://doi.org/10.1111/cdev.12737>.
- Luthar, S. S., & Kumar, N. L. (2018). Youth in high-achieving schools: challenges to mental health and directions for evidence-based interventions. In *Handbook of school-based mental health promotion* (pp. 441–458). Springer, Cham.
- Luthar, S., Kumar, N., & Zillmer, N. (2019). High-achieving schools connote risks for adolescents: problems documented, processes implicated, and directions for interventions. *American Psychologist*, Advance online publication. <https://doi.org/10.1037/amp0000556>
- Luthar, S. S., Kumar, N. L., & Zillmer, N. (2020). Teachers' responsibilities for students' mental health: Challenges in high achieving schools. *International Journal of School & Educational Psychology*, 8, 119–130. <https://doi.org/10.1080/21683603.2019.1694112>.
- Lyman, E. L., & Luthar, S. S. (2014). Further evidence on the “costs of privilege”: perfectionism in high-achieving youth at socioeconomic extremes. *Psychology in the Schools*, 51(9), 913–930. <https://doi.org/10.1002/pits.21791>.
- Malonda, E., Llorca, A., Mesurado, B., Samper, P., & Mestre, M. V. (2019). Parents or peers? Predictors of prosocial behavior and aggression: a longitudinal study. *Frontiers in Psychology*, 10, 2379. <https://doi.org/10.3389/fpsyg.2019.02379>.
- Maner, J. K. (2014). Let's put our money where our mouth is: if authors are to change their ways, reviewers (and editors) must change with them. *Perspectives on Psychological Science*, 9(3), 343–351. <https://doi.org/10.1177/1745691614528215>.
- Masten, A. S., & Tellegen, A. (2012). Resilience in developmental psychopathology: contributions of the project competence longitudinal study. *Development and Psychopathology*, 24(2), 345–361. <https://doi.org/10.1017/S095457941200003X>.
- Morris, A. S., Criss, M. M., Silk, J. S., & Houlberg, B. J. (2017). The impact of parenting on emotion regulation during childhood and adolescence. *Child Development Perspectives*, 11(4), 233–238.

- Murray-Close, D., Holterman, L. A., Breslend, N. L., & Sullivan, A. (2017). Psychophysiology of proactive and reactive relational aggression. *Biological Psychology*, *130*, 77–85. <https://doi.org/10.1016/j.biopsycho.2017.10.005>.
- National Academies of Science, Engineering, and Medicine (NASEM). (2019). Vibrant and healthy kids: aligning science, practice, and policy to advance health equity. doi:<https://doi.org/10.17226/25466>
- Odgers, C. L., & Jensen, M. R. (2020). Annual research review: adolescent mental health in the digital age: facts, fears, and future directions. *Journal of Child Psychology and Psychiatry*, *61*(3), 336–348. <https://doi.org/10.1111/jcpp.13190>.
- Olweus, D., & Limber, S. P. (2010). Bullying in school: evaluation and dissemination of the Olweus Bullying Prevention Program. *American Journal of Orthopsychiatry*, *80*(1), 124–134. <https://doi.org/10.1111/j.1939-0025.2010.01015.x>.
- Pater, J. A., Kim, M. K., Mynatt, E. D., & Fiesler, C. (2016). Characterizations of online harassment: comparing policies across social media platforms. In *Proceedings of the 19th International Conference on Supporting Group Work* (pp. 369–374). doi:<https://doi.org/10.1145/2957276.2957297>.
- Pera, A. (2018). Psychopathological processes involved in social comparison, depression, and envy on Facebook. *Frontiers in Psychology*, *9*, 22. <https://doi.org/10.3389/fpsyg.2018.00022>.
- Pittman, M., & Reich, B. (2016). Social media and loneliness: why an Instagram picture may be worth more than a thousand Twitter words. *Computers in Human Behavior*, *62*(C), 155–167. <https://doi.org/10.1016/j.chb.2016.03.084>.
- Rathmann, K., Bilz, L., Hurrelmann, K., Kiess, W., & Richter, M. (2018). Is being a “small fish in a big pond” bad for students’ psychosomatic health? A multilevel study on the role of class-level school performance. *BMC Public Health*, *18*(1), 1098. <https://doi.org/10.1186/s12889-018-5977-5>.
- Riehm, K. E., Feder, K. A., Tornmohlen, K. N., Crum, R. M., Young, A. S., Green, K. M., Pacek, L. R., la Flair, L. N., & Mojtabai, R. (2019). Associations between time spent using social media and internalizing and externalizing problems among US youth. *JAMA Psychiatry*, *76*(12), 1266–1273. <https://doi.org/10.1001/jamapsychiatry.2019.2325>.
- Rodman, A. M., Powers, K. E., & Somerville, L. H. (2017). Development of self-protective biases in response to social evaluative feedback. *Proceedings of the National Academy of Sciences*, *114*(50), 13158–13163. <https://doi.org/10.1073/pnas.1712398114>.
- Schacter, H. L., & Juvonen, J. (2019). When do friendships help versus hurt? Perceived best friend victimization and support as moderators of peer victimization-related distress. *The Journal of Early Adolescence*, *1*–24. doi:<https://doi.org/10.1177/0272431619874402>.
- Sheldon, K., & Hoon, T. (2007). The multiple determination of well-being: independent effects of positive traits, needs, goals, selves, social supports, and cultural contexts. *An Interdisciplinary Forum on Subjective Well-Being*, *8*(4), 565–592. <https://doi.org/10.1007/s10902-006-9031-4>.
- Smith, A. P. (2019). Student workload, wellbeing and academic attainment. In *International Symposium on Human Mental Workload: Models and Applications* (pp. 35–47). Springer, Cham.
- Smith, R. H., & Kim, S. H. (2007). Comprehending envy. *Psychological Bulletin*, *133*(1), 46–64. <https://doi.org/10.1037/0033-2909.133.1.46>.
- Stroebe, W., & Strack, F. (2014). The alleged crisis and the illusion of exact replication. *Perspectives on Psychological Science*, *9*(1), 59–71. <https://doi.org/10.1177/1745691613514450>.
- Szabo, A., Ward, C., & Fletcher, G. J. (2019). Stress appraisal, information processing strategies, and somatic symptoms: a longitudinal study with immigrants. *Journal of Health Psychology*, *24*(5), 650–660. <https://doi.org/10.1177/1359105316678306>.
- Turel, O., & Serenko, A. (2012). The benefits and dangers of enjoyment with social networking websites. *European Journal of Information Systems*, *21*(5), 512–528. <https://doi.org/10.1057/ejis.2012.1>.
- Twenge, J. M., Martin, G. N., & Spitzberg, B. H. (2018). Trends in U.S. adolescents’ media use, 1976–2016: the rise of digital media, the decline of TV, and the (near) demise of print. *Psychology of Popular Media Culture*, *8*, 329–345. <https://doi.org/10.1037/ppm0000203>.
- Twenge, J. M., Spitzberg, B. H., & Campbell, W. K. (2019). Less in-person social interaction with peers among U.S. adolescents in the 21st century and links to loneliness. *Journal of Social and Personal Relationships*, *36*(6), 1892–1913. <https://doi.org/10.1177/0265407519836170>.
- Van Harmelen, A. L., Kievit, R. A., Ioannidis, K., Neufeld, S., Jones, P. B., Bullmore, E., ... & NSPN Consortium. (2017). Adolescent friendships predict later resilient functioning across psychosocial domains in a healthy community cohort. *Psychological Medicine*, *47*(13), 2312–2322. doi:<https://doi.org/10.1017/S0033291717000836>.
- Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture*, *3*(4), 206–222. <https://doi.org/10.1037/ppm0000047>.
- Vosgerau, J., Simonsohn, U., Nelson, L. D., & Simmons, J. P. (2019). 99% impossible: a valid, or falsifiable, internal meta-analysis. *Journal of Experimental Psychology: General*, *148*(9), 1628–1639. <https://doi.org/10.1037/xge0000663>.
- Webber, R. (2017). The comparison trap. Psychology today. Retrieved from <https://www.psychologytoday.com/us/articles/201711/the-comparison-trap>
- Yates, T. M., Egeland, B., & Sroufe, L. A. (2003). Rethinking resilience: a developmental process perspective. Resilience and vulnerability: adaptation in the context of childhood adversities, 243, 266.