Predictive Qualities of Personality, Self-Esteem and Stressors on the Impact of Covid-19 in Adolescents

Abstract

Introduction: This study aims to investigate if individual variations in personality, self-esteem, and stressors affected the impact of Covid-19 on academic performances, social lives, and mental health of adolescents.

Methods: 172 (114 female, 58 male) participants aged 13-19 years attending a boarding school in New Jersey, USA, completed 16 multiple choice items; the Ten Item Personality Inventory (measuring the Big Five personality traits), the single-item self-esteem scale, and the Adolescent Stressors Questionnaire (ASQ-14). Data were collected using an online survey over a two-week period in March 2022.

Results: Despite Covid-19 being on a decline from November 2020 to March 2022, students rated mental health as continuing to be negatively impacted. It was also found that personality traits, particularly emotional stability, extraversion, and conscientiousness were correlated with a greater severity of impact across multiple aspects of the pandemic. Self-esteem and stressors were also associated with multiple aspects. However, only stressors were predictive of academic impact in a structural equation model.

Conclusions: Given the associations observed in the current study, it is likely that adolescents experiencing greater stress may be at a greater risk of the Covid-19 pandemic negatively impacting their mental health. Targeted mental health interventions should be implemented for these high-risk groups. Future research could consider

investigating moderating effects between severity of Covid-19 impact and individual differences.

Keywords: Coronavirus; Adolescents; Personality; Self-esteem; Stressors; Mental health.

Impact of Covid-19 on associations between Personality, Self-esteem, Stressors in Adolescents

The Covid-19 pandemic has resulted in a rise in mental health-related issues. It was estimated that the global prevalence of depression and anxiety increased 27.6% and 25.8%, respectively, in 2020 as compared to 2019 (Santomauro et al., 2021). Adolescents, in particular, appear to be vulnerable to the negative psychological effects of the Covid-19 pandemic (Panchal et al., 2021) given that young people are at higher risk of developing mental problems than are adults (Deighton et al., 2019). Even pre-COVID one in every four adolescents have been found to meet diagnostic criteria for at least one mental health disorder (Merikangas et al., 2010). It is therefore important to understand whether the COVID-19 pandemic has contributed further to increased mental health difficulties in adolescence. In November of 2020 we surveyed 193 adolescents at a boarding school and a majority of students surveyed stated that their mental health (57.0%) and their social lives (62.2%) had been negatively impacted as a result of the pandemic (Kumar et al., 2022).

Individual differences, such as the Big Five personality traits (Goldberg, 1990), are associated with differences in long term well-being (Hayes & Joseph, 2003) and predisposition to mood disorders, including depression and anxiety (Kotov, Gamez, Schmidt, & Watson, 2010). The impact of Covid-19 pandemic is variable and dependent on certain personality traits. In a study of young adults surveyed between July and August 2020, Anglim and Horwood (2021) noted that extraversion and agreeableness were positively associated while neuroticism was negatively associated with subjective well-being. Gubler, Makowski, Troche, and Schlegel (2021) reported that high levels of

neuroticism were associated with greater loneliness, but that extraversion may not protect against loneliness and well-being when opportunities to engage in social activities are limited. Amongst young adults Rettew et al. (2021) found that neuroticism was negatively associated and extraversion, agreeableness, and conscientiousness were positively associated with mood, lower stress, and greater participation in health promotion activities. Additionally, individuals with high levels of extraversion were found to have larger decreases in mood across time during the pandemic, when compared to individuals with low levels of extraversion (though it should be noted that even with these larger decreases, individuals with high levels of extraversion still had better mood than individuals with low levels of extraversion).

However, there is a paucity of research investigating associations between the impact of the Covid-19 pandemic and such individual differences in adolescents. To the best of the our knowledge, only Iterbeke and De Witte (2021) have investigated this younger population, and found that students aged 13-18 years with high levels of neuroticism report higher levels of stress, whereas highly conscientious and more open students more easily adjusted to the pandemic. The current study aimed to investigate whether individual differences (personality, self-esteem, and stressors) were associated with the impact of Covid-19 on academic lives, social lives, and mental health. The survey also compared the impact of Covid-19 on students' academic lives, social lives, and mental health from November 2020 to March 2022. It was hypothesized that students' social lives, athletic lives, and academic lives would be less impacted in the current data due to easing of Covid-19 related restrictions during the 16-month gap between surveys. It was also hypothesized that different personality dimensions (based

on the Big Five), self-esteem, and adolescent stressors would be associated with and predictive of various aspects of the impact of Covid-19.

Method

Participants:

172 high school students (mean age = 16.25 years, *SD* = 1.29 years, range = 13-19 years) participated in the study. Of the 172 students 58 were male, 111 female, and 3 others. Of these, 112 were residential boarding and 60 were day students.

Measures:

The Covid-19 related survey was based on a survey administered previously by our group in (2022). The survey consisted of 16 multiple choice items relating to the impact of Covid-19 on participant's social lives, academic lives, and mental health. The response options for these items were Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. These were recorded numerically with values ranging from 1-5. A full list of survey questions is displayed in Table 1.

Table 1

Frequency of Covid-19 Related Survey Responses

	Frequency				
Item	Strongly disagree *n* (%)	Disagree *n* (%)	Neutral *n* (%)	Agree *n* (%)	Strongly agree *n* (%)
I trust the Covid-19 vaccines	6 (3.49%)	2 (1.16%)	13 (7.56%)	57 (33.14%)	94 (54.65%)
I am worried about getting Covid-19 at school.	59 (34.3%)	41 (23.84%)	31 (18.02%)	20 (11.63%)	21 (12.21%)

I have had a difficult time meeting new people in my classes	13 (7.56%)	58 (33.72%)	32 (18.60 %)	47 (27.3 3%)	22 (12.79%)
I have had a difficult time meeting new people in my house	28 (16.28%)	60 (34.88%)	22 (12.79 %)	39 (22.6 7%)	23 (13.37%)
I have found it hard to form close bonds with people in my house	26 (15.12%)	52 (30.23%)	15 (8.72%)	47 (27.3 3%)	32 (18.60%)
I've participated in campus-organized social events this term	12 (6.98%)	32 (18.6%)	11 (6.40%)	72 (41.8 6%)	45 (26.16%)
This term, I feel a strong sense of school spirit	30 (17.44%)	54 (31.4%)	53 (30.81 %)	27 (15.7 0%)	8 (4.65%)
I am satisfied with my level of physical activity	22 (12.79%)	29 (16.86%)	24 (13.95 %)	56 (32.5 6%)	41 (23.84%)
Has Covid-19 negatively impacted your social life?	9 (5.23%)	19 (11.05%)	35 (20.35 %)	52 (30.2 3%)	57 (33.14%)
I find it more difficult to stay focused/engaged in hybrid classes as an in-person participant	15 (8.72%)	46 (26.74%)	45 (26.16 %)	46 (26.7 4%)	20 (11.63%)
I find it more difficult to stay focused/engaged in hybrid classes as a participant on Zoom	5 (2.91%)	9 (5.23%)	8 (4.65%)	31 (18.0 2%)	119 (69.19%)
I prefer all-virtual classes to hybrid classes	51 (29.65%)	38 (22.09%)	15 (8.72%)	32 (18.6 0%)	36 (20.93%)
It has been difficult for me to develop relations with teachers	11 (6.40%)	42 (24.42%)	27 (15.7%	64 (37.2	28 (16.28%

			)	1%)	)
I find it more difficult to ask teachers for help	19 (11.05%)	41 (23.84%)	36 (20.93 %)	51 (29.6 5%)	25 (14.53%)
It has been harder to work together with my classmates	6 (3.49%)	31 (18.02%)	28 (16.28 %)	71 (41.2 8%)	36 (20.93%)
Covid-19 has had a negative impact on my mental health	7 (4.07%)	19 (11.05%)	26 (15.12 %)	50 (29.0 7%)	70 (40.70%)

The Big Five personality dimensions were measured using the Ten-Item Personality Inventory (Gosling, Rentfrow, & Swann Jr., 2003). Each personality dimension (agreeableness, conscientiousness, extraversion, openness, and emotional stability) were measured with two items each on a seven-point scale (Disagree strongly. Disagree moderately, Disagree a little, Neither agree nor disagree, Agree a little, Agree moderately, Agree strongly).

Adolescent stress was measured using the Adolescent Stress Questionnaire 14-item version (ASQ-14; Blanca Mena, Escobar Espejo, Lima Ramos, Byrne, & Alarcón Postigo, 2020). The 14 items had five response options each (Not at all stressful, A little stressful, Moderately stressful, Quite stressful, Very stressful). The items were summed such that a higher score indicated greater levels of stress.

Self-esteem was measured using the Single-Item Self-Esteem Scale (SISE; Robins, Hendin, & Trzesniewski, 2001). Participants were asked to respond to the statement “I have high self-esteem.” Response options were Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree.

Procedure

The survey was conducted in March 2022, when students had returned to in-person classes in September 2021. Learning for these students had been remote from March 2020-June 2020, hybrid or fully remote from September 2020-June 2021, and fully in-person learning from September 2021 onwards. The only exception to fully in-person learning was if a student tested positive for Covid-19, in which case they would isolate and participate exclusively in virtual learning for five days. During this time, the state of New Jersey had a stay-at-home order from March 21 to June 9, 2020, and was under a state of emergency (lifted March 7, 2022). The survey was administered using Google Forms. Students were recruited via email sent to their school email address from the school and had one week to complete the survey. There was no remuneration offered for participating in this survey.

Statistical Analyses:

R version 4.1.0 (R Core Team, 2021) was used for all analyses. To test the hypothesis that the impact of Covid-19 had changed over time, previously published data by our group in 2022 (n = 193) was compared to data collected in the current study, allowing us to compare the impact of Covid-19 between November 2020 and March 2022 from the same sample pool. Fifteen Covid-19-related survey items were common to the two studies, and were compared using Mann-Whitney U tests (pairing of participants' responses across the two time points was not possible). To test whether personality traits, self-esteem, and/or adolescent stressors were associated with Covid-19 related impact on academic lives, social lives, and/or mental health, Spearman correlations were conducted between each variable, as the data were ordinal

(i.e., rank-based) in nature. For all analyses, an alpha level of α = .05 was used as a cut-off for statistical significance. Correlations were considered to be weak, moderate, or strong based on values of *r* = .10, .30, and .50, following Cohen's (1992) guidelines.

Confirmatory factor analysis (CFA) was conducted to determine the factorial structure of academic and social impact of Covid-19. In order to evaluate the academic impact and social impact latent variables for dimensional distinctness, a single-factor model was compared against a correlated two-factor model. Additionally, dimensional distinctness was indicated if the 95% upper-bound correlation confidence interval between the two factors did not intersect with 1.0. In order to evaluate the potential influence of personality, self-esteem, stressors, age, and sex on academic and social impact, the impact latent variables were regressed onto the stressors latent variable, and the personality, self-esteem, age, and sex observed variables in a structural equation model (SEM). The standardized beta weights associated with each of the predictors were of key interest.

Based on guidelines summarized by Schweizer (2010), latent variable models were evaluated to be well-fitting according to the following criteria: Comparative fit index (CFI) ≥ .950; Tucker-Lewis index (TLI) ≥ .950; standardized SRMR < .08; and the root mean square error of approximation (RMSEA) < .06. The 90% confidence intervals of the RMSEA are also reported. The Bayesian information criterion (BIC) was used to compare models. Smaller BIC values indicate better fitting models. For thoroughness, the implied model chi-square statistics are also reported. All models were tested in lavaan version 0.6-14 (Rosseel, 2012) via maximum likelihood estimation, although the standard errors and confidence intervals were estimated via bias-corrected

bootstrapping (with 1,000 replications), in order to help ensure robustness to any deviations from normality.

Results:

Frequencies of responses to the Covid-19 related survey are presented in Table 1. Descriptive statistics for the five personality dimensions, ASQ-14, and SISE are presented in Table 2, and correlations between these measures are in Table 3. Three personality dimensions (extraversion, conscientiousness, and emotional stability) were associated with the SISE, and that conscientiousness and emotional stability were associated with the ASQ-14. However, it was noted that the correlations between emotional stability and the SISE and ASQ-14 were much higher than any other association measured in this table.

Table 2

Descriptive Statistics of Personality Dimensions, SISE, and ASQ-14

Measure	*M*	*SD*	Min	Max
Agreeableness	9.52	2.27	3	14
Conscientiousness	10.55	2.81	3	14
Extraversion	8.55	3.38	2	14
Emotional Stability	8.06	3.24	2	14
Openness	10.60	2.28	3	14
SISE	2.92	1.25	1	5
ASQ-14	41.91	11.81	14	70

Table 3

Correlations between Personality Dimensions, SISE, and ASQ-14

Measure	1	2	3	4	5	6	7

1. Extraversion	-						
2. Agreeableness	.06	-					
3. Conscientiousness	.00	.01	-				
4. Emotional Stability	.12	.24**	.20**	-			
5. Openness	.13	.02	.19*	.02	-		
6. ASQ-14	.12	-.11	-.23**	-.53****	.05	-	
7. SISE	.25***	.06	.20**	.54****	.09	-.27***	-

Note. * $p < .05$; ** $p < .01$; *** $p < .001$; **** $p < .0001$.

Given the easing of Covid-19 related restrictions, it was hypothesized that students' social lives, athletic lives, and academic lives would be less impacted in March 2022 compared to November 2020. Figure 1 shows the mean response to each Covid-19 related survey item for the two time points. Significantly more students agreed with statements noting that it was less difficult in March 2022 as compared to November 2020 to form bonds with housemates, meet classmates, meet housemates, work together with classmates, and get help from teachers. Conversely, in March 2022, significantly more students agreed with statements that it was more difficult to focus on zoom, that they are less focused in person, reporting greater satisfaction with levels of physical activity, increased preference of virtual classes, and increased school spirit. Importantly, the impact of Covid-19 on mental health did not significantly change from November 2020 to March 2022 ($p = .058$).

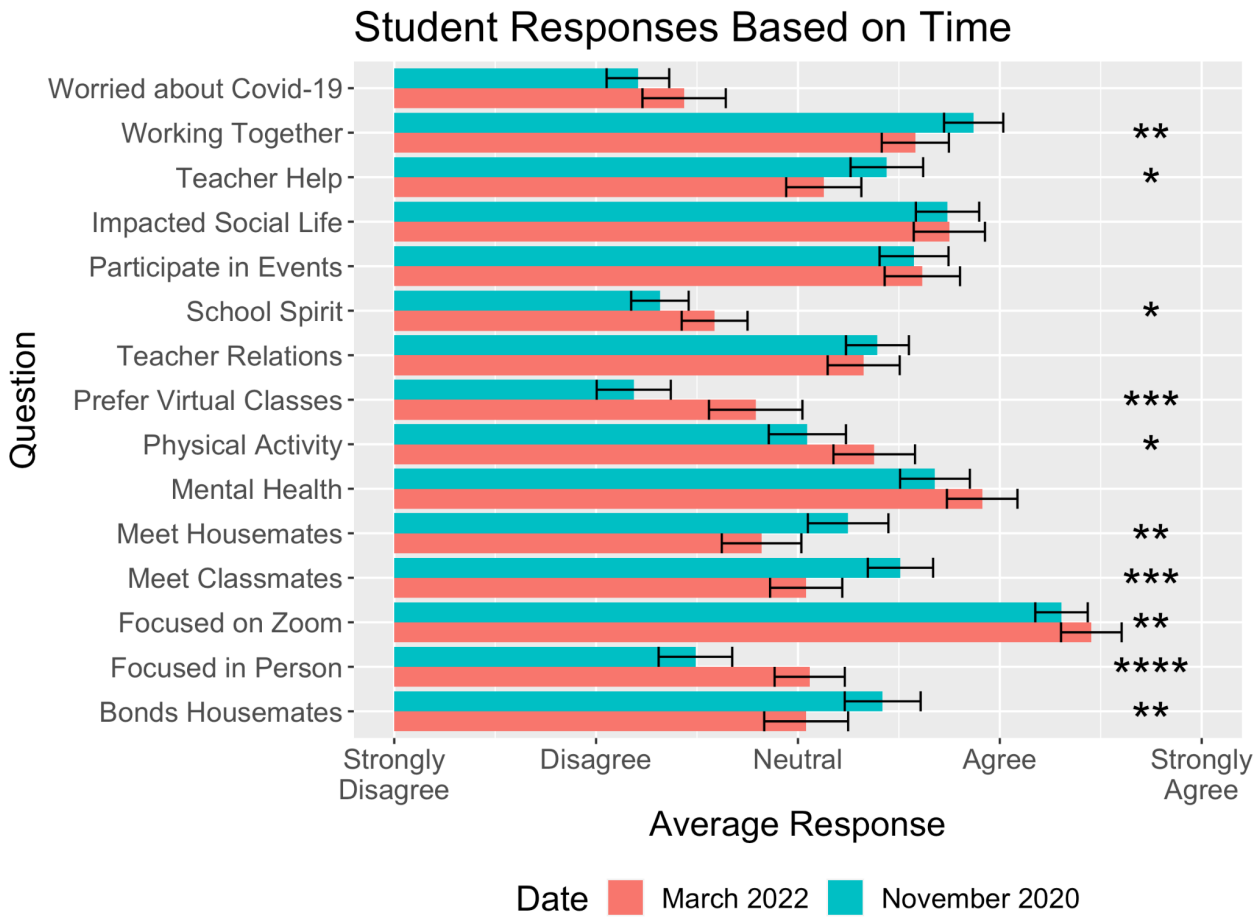

Figure 1. Time differences for each survey item. Error bars show 95% confidence intervals. Asterisks indicate a statistically significant difference between groups (* p < .05; ** p < .01; *** p < .001; **** p < .0001).

It was also hypothesized that different personality dimensions (based on the Big Five), self-esteem, and adolescent stressors would be associated with varying impact from Covid-19. Figure 2 shows a heatmap of correlations between each Covid-19-related survey item and each psychographic trait (values for each correlation are in Supplemental materials). It was found that high scores on the ASQ-14 were generally associated with a greater impact of Covid-19. Likewise, low scores on SISE and emotional stability were generally associated with greater impact.

Conscientiousness and extraversion were found to be associated with some Covid-19-related survey items, but not to the same extent as the ASQ-14, SISE, and emotional stability scores. Agreeableness and openness were generally not associated with Covid-19-related impacts.

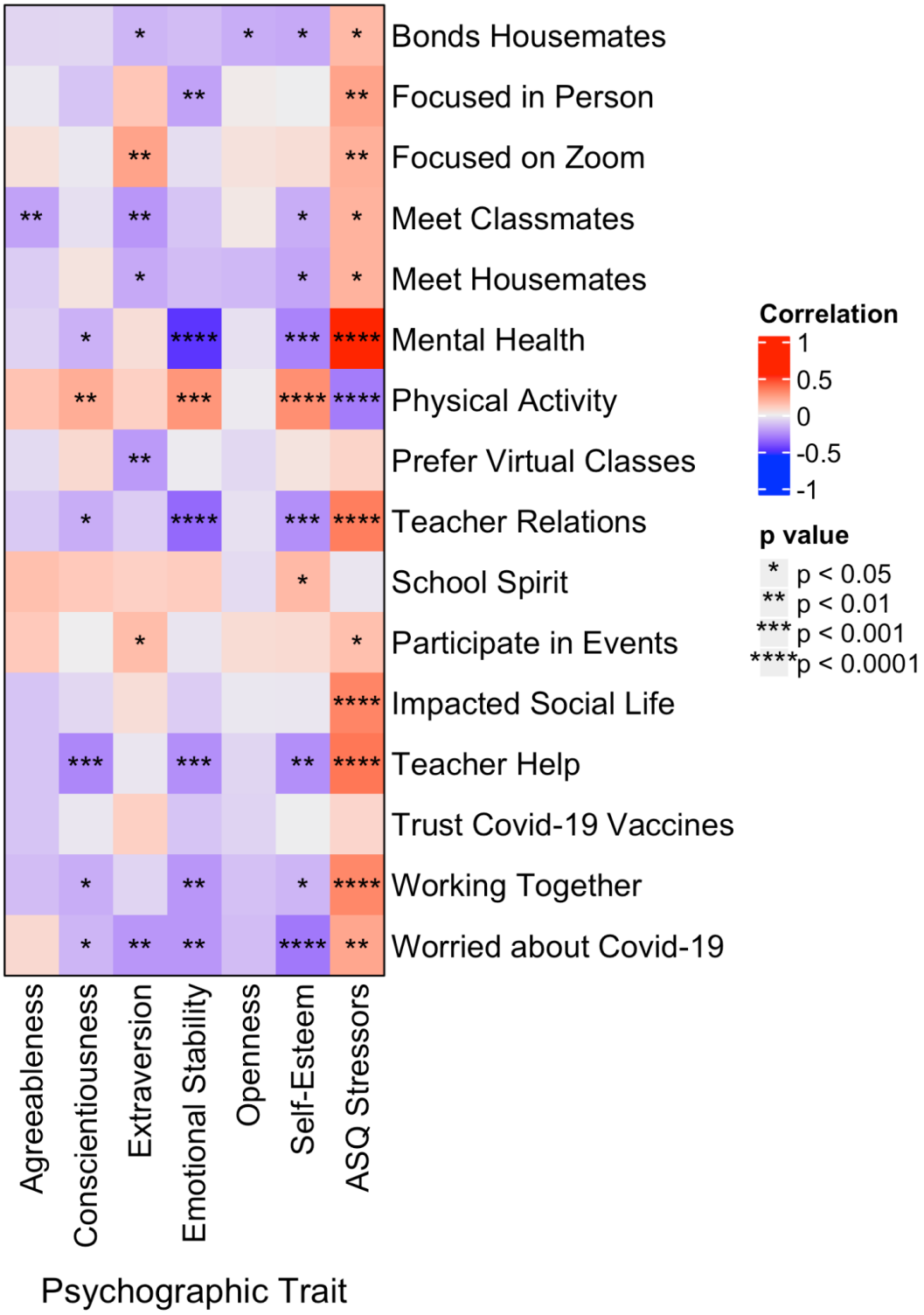

Figure 2. Spearman rank correlations between psychographic traits and Covid-19-related survey items.

Latent Variable Analyses

The single-factor impact model was found to be associated with unacceptable model-fit, $\chi2(73) = 154.69$, $p < .001$, CFI = .84, TLI = .80, RMSEA = .081 (90% CI = .063 - .098), SRMR = .082, BIC = 7497.74. By contrast, the social impact and academic impact correlated-two factor model was found to be associated with generally acceptable model fit, $\chi2(72) = 125.52$, $p = < .001$, CFI = .90, TLI = .87, RMSEA = .066 (90% CI = .046 - .085), SRMR = .077, BIC = 7473.71. Furthermore, the correlated two-factor model fit better than the single-factor model, $\Delta\chi2(1) = 29.17$, $p < .001$, ΔBIC = -24.03. The correlation between the two latent variables was estimated at $r = .63$ (95% CI = .37 – .88). Thus, there was consistent evidence for dimensional distinctness of social impact and academic impact in this sample. Two items on the social impact factor (“school spirit” and “participating in school events”) did not significantly load onto the factor, so were removed from further analyses.

Next, the structural equation model was tested, with personality traits, self-esteem, stressors, age, and sex as predictors of CIE. Model fit statistics were mixed, $\chi2(476) = 911.33$, $p < .001$, CFI = .76, TLI = .72, RMSEA = .073 (90% CI = .066 - .080), SRMR = .079. It was found that none of the nine predictors were significantly predictive of social impact (all ps > .26), despite the R^2 for social impact being .46. Thus, 46% of the variance in social impact was accounted for by the model that included all five personality traits, self-esteem, stressors, age, and sex as predictors of social impact, despite none of them being uniquely predictive. For academic impact, stressors was the only significant predictor ($\beta = .420$, $p = .012$), and $R^2 = .32$. Figure 3 shows the final structural equation model.

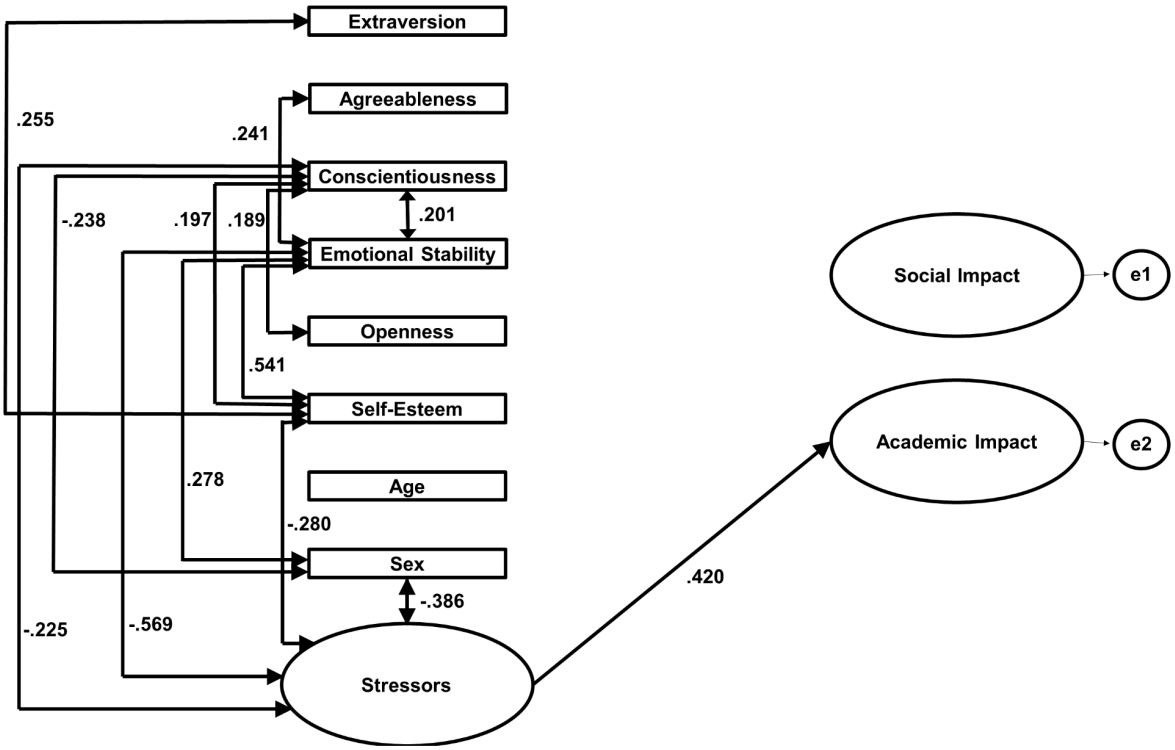

Figure 3. Structural equation model of personality traits, self-esteem, stressors, age, and sex predicting academic impact and social impact. The line with the single-headed arrow represents a statistically significant regression coefficient. Lines with double-headed arrows represent statistically significant correlations. Non-significant parameters are not shown.

Discussion:

The current study aimed to investigate whether individual differences (personality, self-esteem, and stressors) were associated with the impact of Covid-19 on academic lives, social lives, and mental health. The survey also compared the impact of Covid-19 on students' academic lives, social lives, and mental health from November 2020 to March 2022. It was hypothesized that students' social lives, athletic lives, and academic lives would be less impacted in the current study due to easing of Covid-19

related restrictions during the 16-month gap between surveys (November 2020 vs. March 2022). It was hypothesized that different personality dimensions, self-esteem, and adolescent stressors would be associated with and predictive of various aspects of the impact of Covid-19. Overall, the results of the current study somewhat supported these hypotheses.

It was found that students reported a less severe impact of Covid-19 in March 2022 than in November 2020. Specifically, there were significant decreases in impact on students abilities to focus during in-person classes and during zoom classes, meeting classmates, preferring virtual classes, forming bonds with housemates, meeting housemates, greater satisfaction with physical activity, increased school spirit, more willingness to reach out to teachers for help, and more working together in the classroom. This may be due to greater opportunities for social interactions, physical activity, and support in the classroom, and a greater appreciation of these opportunities. Disruptions in schools also have the potential to negatively impact stability and development in adolescents, as school is the major social connection for this demographic. Zaeske et al. (2022) reported that adolescents had an appreciation for their educators as a result of the restrictions put in place as a result of the pandemic, and Larivière-Bastien et al. (2022) found that children and adolescents place great importance on friendships and socialization, and online school is generally unsatisfying. However, it should be noted that impact on mental health did not significantly change between the two time points. That is, although Covid-19 may have less of an impact in terms of academic and social lives in adolescents, deterioration of mental health may linger for an extended period of time. Samji et al. (2022) conducted a systematic review

of peri- and post-pandemic mental health in children and adolescence and found that general mental health, depressive symptoms, anxiety symptoms, and suicidal ideation were higher during the pandemic than compared to pre-pandemic. Given the current results suggest that these issues are not alleviating, the negative impacts on the mental health of adolescents need to be addressed to mitigate further long-term impacts. Additionally, seeing as the role that adult and peer relationships play in adolescent development is well-established (Field et al., 2002), the impact of the absence of teachers, other mentors, and peers on adolescents' social development warrants further investigation.

The current study also found that different personality dimensions were differentially associated with the impact of the pandemic, which is consistent with previous literature. At the item level, emotional stability was negatively associated with a range of COVID-19 survey items, including being worried about Covid-19, impact on mental health, level of physical activity, willingness to ask teachers for help, and being able to form relationships with teachers, although emotional stability was not predictive in the structural equation model. Previous research found that neuroticism (i.e., emotional instability) was positively correlated with greater loneliness, worsened mood, more stress, less participation in health promoting activities, and lower overall well-being (Anglim & Horwood, 2021; Gubler et al., 2021; Iterbeke & De Witte, 2021). This may be a result of the changes in life due to the pandemic and the unstable nature of individuals with high levels of neuroticism. Similarly, extraversion was found to be linked to loneliness and decreased well-being, decreases in mood as the pandemic progressed, higher perceived stress, and emotional suppression, which may be the

result of fewer social opportunities and a restricted amount of people to interact with (Gubler et al., 2021, Rettew et al., 2021). Interestingly, conscientiousness had a very similar pattern of associations with the Covid-19 related survey items to emotional stability. However, given the relatively low correlation between conscientiousness and emotional stability, it is likely that these associations were observed for different reasons. Individuals low in conscientiousness may struggle with planning and organization, and therefore may have felt greater impact on being able to develop relations with teachers, asking teachers for help, and working with other students. Previous research has also shown that high levels of conscientiousness are associated with better psychological well-being during the pandemic (Anglim & Horwood, 2021; Iterbeke & De Witte, 2022). Lastly, it was found that agreeableness and openness were generally not associated with the impact of Covid-19. Previous research (Anglim & Horwood, 2021; Iterbeke & De Witte, 2022) has reported that agreeableness is not typically associated with the impact of the pandemic, and that openness is generally associated with other, more positive aspects that were not measured in the current study (e.g., considering the period as an opportunity to learn new skills).

It was also found that self-esteem and adolescent stressors were associated with many of the Covid-19 related items. Specifically, high-self esteem and/or low stressors were protective against the impact of the pandemic. Previous research has found that self-esteem in adolescents is negatively associated with fear of Covid-19 and a sense of isolation (Rossi et al., 2020), and is positively associated with academic performance during the pandemic (Lee, Lim, Allen, & Choi, 2021). The structural equation model, however, highlighted the unique predictive role that stress plays on academic impact:

whilst several personality traits (e.g., emotional stability) correlated with individual academic impact items, stressors was the only significant predictor of academic impact, implying that personality traits have no bearing above and beyond stress on academic impact in this sample.

A limitation of this survey is that it was administered at a single private boarding school on the east coast of the USA, which is unlikely to be representative of the global adolescent population. Additionally, it was not possible to match survey responses from November 2020 to March 2022 due to the anonymous nature of the survey. Follow-up surveys related to long-term impact on individual academic life, social life, and mental health are needed.

In conclusion, the current study aimed to investigate whether individual differences (personality, self-esteem, and stressors) were associated with the impact of Covid-19 on academic lives, social lives, and mental health. It was found the impact of Covid-19 on most aspects had decreased since November 2020, but students still felt that their mental health had been negatively impacted. Additionally, personality traits (particularly emotional stability, extraversion, and conscientiousness), self-esteem, and stressors were found to be associated with the severity of impact of Covid-19 on the academic lives, social lives, and mental health of adolescents, but stressors was the major unique predictor in the structural equation model. Whilst it is concerning that adolescents still consider their mental health to be negatively impacted, the results of the current study may allow identification of individuals most at risk of mental health problems based particularly on stressors, but also personality profile and self-esteem.

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The importance of school

Disruptions in school communities have been particularly deleterious to adolescent stability and development, as school is the major social connection for this group. The loss of a physical learning community, the shift to online

learning have had differential outcomes based on gender and underlying predisposition. Given the critical role of adult and peer relationships in adolescent development [34], the impact of the absence of teachers, mentors (e.g., coaches, music/art instructors), and peers on adolescents' attachment, social competence, social networks, intimate relationships, and friendships needs further exploration.

The potential for long-term COVID-19 impacts on mental and behavioral health necessitates a comprehensive approach to addressing adolescent psychological health, substance use, and economic stability. Given the high likelihood of future school disruptions through man-made and natural disasters, alternatives to physical closures should be immediately explored. Access barriers to community mental health services for adolescents need to be addressed to enhance service provision, especially for economically disadvantaged youth who are more likely to experience racism and discrimination, mistrust of systems, and face a scarcity of resources in areas of disinvestment [35]. More attention should be given to making chat, text, and video-based modalities more accessible for adolescent mental health care, including making them more equitable for low-income families [[36],

[37], [38]]. Furthermore, longitudinal examinations of adolescent mental health can help identify protective factors that improve health and highlight risk factors to target with further intervention.

Limitations

As with all studies, findings must be interpreted in light of several limitations. First, all data were based on adolescent self-report. Although adolescents are reliable reporters of their distress and impairment [39], future studies could benefit from a multi-informant approach to include both parents and teachers. Second, the mental health and substance use outcomes were both measured at W3, limiting our ability to establish temporal relationships between these variables. Furthermore, our measure of substance misuse was limited to past-year use. Future studies should consider more recent misuse and the intensity of misuse. Third, while controlling for prepandemic mental health and substance use was a major strength, our study remains limited by having only one assessment point during the COVID-19 pandemic. Longitudinal studies that follow adolescents postvaccination and lockdowns

are needed. Finally, some substances had relatively little endorsement making it impossible to conduct any subgroups analyses.

Public health implications

In this small sample of adolescents, we found that COVID-19-induced isolation, loneliness, stress, and economic challenges were linked to increased mental health and misuse of licit and illicit substances. Critically, we assessed psychological health and substance use prior to and during the pandemic, which allowed us to control for baseline psychosocial factors. Adolescence is an important time to attend to new onset or worsening of mental health difficulties, particularly given that this period represents a time of developmental change marked by greater desire for autonomy, pressure to conform, and ongoing development of self-regulation and executive function skills (including features associated with inhibitory behaviors and impulsivity) [40]. Furthermore, adolescence is the time period most linked to the onset of risk-taking behaviors, including substance use [41]. The COVID-19 pandemic disrupted multiple aspects of adolescent development. Understanding the short- and long-term impact of this global crisis on

adolescent mental and behavioral health is necessary for the development of prevention and intervention programs, not only for the current crisis but for future global (e.g., war, future pandemics) and regional (e.g., natural disasters) events. To further inform prevention and intervention programs, future research should identify factors that mitigate or exacerbate the negative outcomes identified in this study.