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# COVID-19 trauma-related stress in young people: do sensory-processing sensitivity, resilience, and life satisfaction play a role?

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## ABSTRACT

Although COVID-19 was experienced as a traumatic event with long-lasting effects, there is limited data on its traumatic impact in relation to factors that can promote or threaten young people's mental well-being. This study investigated the association between sensory-processing sensitivity (SPS), resilience, and life satisfaction with COVID-19 trauma-related stress and whether resilience mediates the relationship between SPS and COVID-19 traumatic stress in a young sample. A total of 441 individuals aged between 16 and 25 years ( $M_{age} = 19.26$ ,  $SD = 1.65$ ) participated in an online survey in the UK between November 2021 and April 2022. We found that SPS was positively correlated, and resilience was negatively correlated with COVID-19 trauma-related stress. Life satisfaction was not significantly related to COVID-19 trauma-related stress. A mediation analysis showed that the relationship between SPS and COVID-19 trauma-related stress was mediated by resilience. Our findings suggest that resilience can be a protective factor against the traumatic effect of COVID-19 in young people, but other factors should also be considered. Our study makes implications about the potential benefits of including resilience in interventions which target young people's mental wellbeing.

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## KEYWORDS

Sensory-processing sensitivity; COVID-19 trauma-related stress; resilience; adolescents; young people

The outbreak of COVID-19 in 2019 led to a global crisis involving severe protective measures such as lockdowns and school closures (Cucinotta & Vanelli, 2020; Iordanou, 2023). Viral outbreaks such as this one can lead to traumatic stress (Vanaken et al., 2020). Indeed, recent research findings suggest that COVID-19 can be perceived as a traumatic event which may be linked to post-traumatic stress disorder (PTSD) (Bridgland et al., 2021). Even though COVID-19 does not fully meet the diagnostic criteria for PTSD, newer research indicates it can cause traumatic stress symptoms as it is an ongoing global stressful event. This was supported by Sanchez-Gomez et al. (2021) who showed that COVID-19 was perceived as a mass traumatic event to which people responded by adopting a position of hypervigilance. These findings indicate that the pandemic can lead to detrimental mental health challenges relevant to PTSD.

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Several studies during COVID-19 showed a rise in mental health problems such as anxiety, depression, and traumatic symptoms and a decline in life satisfaction (e.g. Hawes et al., 2022; Shevlin et al., 2020). However, the pandemic did not affect everyone to the same degree. While older adults were more susceptible to the virus, young people presented more mental health-related challenges (i.e. anxiety and depression) due to reduced coping strategies, inability to communicate their feelings the way adults do, a more limited understanding of the event, and misinformation on social media (Imran et al., 2020; Magson et al., 2021; Varma et al., 2021). These effects were due to school closures, social isolation, and loss of routines which further led to symptoms such as fear, worry, irritability, concentration difficulties, etc (Pfefferbaum, 2021). School closures in particular had detrimental effects on young people's wellbeing, while transitioning to online learning spaces added to their stress (Viner et al., 2022). Taken together, these findings indicate that young people's poor mental health outcomes during COVID-19 are the result of multiple complicated factors.

One less investigated factor in relation to COVID-19 mental health outcomes is sensory-processing sensitivity (SPS). SPS is a personality trait of and involves heightened processing of sensory information, heightened awareness of stimulation from the environment, and a stronger emotional reaction to stimuli (Aron et al., 2012). Previous research showed that SPS is positively related to childhood trauma and the relationship between childhood trauma and future psychological distress may be mediated by sensory sensitivity (e.g. Hiles Howard et al., 2019; Karaca Dinç et al., 2021). In line with SPS theory, some people are more reactive to environmental stimuli than others (Booth et al., 2015). More specifically, being environmentally sensitive can increase the possibility of being adversely affected by the COVID-19 pandemic while also increasing the probability of benefiting from positive experiences (Iimura, 2021, 2022). It is thus imperative to empirically investigate this factor in young people. Several cross-sectional studies show that highly sensitive adolescents present higher anxiety and depression levels (Boterberg & Warreyn, 2016; Burgard et al., 2022). A recent study showed that highly sensitive adolescents suffer from decreased socioemotional well-being if they have experienced significant negative life events a week before (Iimura, 2021). Further, highly sensitive individuals may have more intense emotional reactions to life changing events (Aron et al., 2012) such as an epidemic. These findings indicate that SPS may be a vulnerability factor for young people's mental health.

Environmental sensitivity can pose less threat for youth's mental health if protective factors such as resilience are present (Iimura, 2022). Resilience is the process of adapting to or overcoming significantly stressful or adverse situations (Luthar & Eisenberg, 2017) and it is associated with adaptation to situations involving mass adversity (Prime et al., 2020; Smith et al., 2008). This was supported by Kavčič et al. (2021) who showed that resilience was a key feature in promoting healthy psychological functioning throughout COVID-19, protecting against the negative impact of stress. A recent study by Iimura (2022) explored the association between SPS and COVID-19 stress and the mediating role of resilience in a Japanese sample. Iimura found that SPS was positively correlated with COVID-19 stress, and resilience buffered this relationship, suggesting that being environmentally sensitive is not necessarily a vulnerability factor if one is also resilient.

Iimura's findings (Iimura, 2022) have been supported by previous work involving samples from across the globe showing that the pandemic had a negative impact on

young people's mental health and life satisfaction (Zolopa et al., 2022) which may also act as a shield against stress during COVID-19. Life satisfaction is a key determinant of young people's wellbeing and psychological functioning (Proctor et al., 2008). It involves the overall cognitive appraisal of one's subjective wellbeing in general or specific aspects of one's life (Diener, 1994; Diener et al., 1985). Previous work showed a negative association between life satisfaction and stress, indicating that those with overall higher life satisfaction may be less negatively affected by stressful events (Smyth et al., 2016). Trzebiński et al. (2020) found that life satisfaction was negatively associated with state anxiety and COVID-19 stress, suggesting that higher life satisfaction may be related with fewer stressful responses to the threat posed by the pandemic. A more recent study found that resilience and life satisfaction mediated the relationship between COVID-19-related worry and depression, anxiety, and stress in young people (Tamarit et al., 2022). Further research showed that happiness and satisfaction with life were key components in predicting depression, anxiety, and worry (Gawrych et al., 2021; Satici et al., 2020). Collectively, these findings indicate that resilience and life satisfaction can boost young people's wellbeing during a crisis.

Individual differences in SPS, resilience, and life satisfaction can all be important factors, furthering our understanding of how young people adapted mentally to the COVID-19 pandemic. Nonetheless, due to the uniqueness of this event, knowledge of their role is limited. As the aftereffects of an epidemic can persist long-term, even after three years, particularly when quarantine measures are imposed (Wu et al., 2009), our study looks at certain personality traits, which can potentially threaten or protect youth from the negative mental health effects of COVID-19.

Iimura's (2022) and other previous work examined people's stress response to the pandemic using primary scales which measure broader stress-related symptoms (e.g. the Covid Stress Scale, CSS, Taylor et al., 2020). We aimed to expand and build on Iimura's study in two ways; first, we looked at the relationship between sensory-processing sensitivity and resilience with COVID-19 trauma-related stress (i.e. where young people experienced COVID-19 as a traumatic event) in older adolescents and young adults (aged 16–25 years), using a validated scale which measures trauma symptoms (i.e. the IES-Covid19, Vanaken et al., 2020). We further examined if life satisfaction played a role in this relationship. As lockdowns in Japan were less strict compared to parts of the UK, and stricter lockdowns are related to negative health changes and poorer mental health outcomes (Ingram et al., 2022), we conducted a similar study to Iimura's to investigate corresponding effects in young people in the UK. Our study aims to add to the current literature on the effects of COVID-19 on young people's wellbeing. We hypothesise that (a) sensory-processing sensitivity will be positively associated with COVID-19 trauma-related stress and resilience and life satisfaction will be negatively associated with COVID-19 trauma-related stress. In line with Iimura (2022), we also hypothesise that (b) the relationship between sensory-processing sensitivity and COVID-19 trauma-related stress will be mediated by resilience.

## Method

The inclusion criteria involved participants between 16 and 25 years of age. If a participant was above 25, they were excluded from the study. A total of 441

participants aged between 16 and 25 years ( $M_{age} = 19.26$ ,  $SD = 1.65$ ) partook in the study. There were 123 adolescent participants, aged 16–18 years, and 318 adults aged 19–25 years, suggesting that participants were either late adolescents or young adults (Iimura, 2022; Sawyer et al., 2018). In total, 291 identified as females (66%,  $M_{age} = 19.58$ ,  $SD = 1.23$ ), 144 identified as males (32.7%,  $M_{age} = 18.59$ ,  $SD = 2.14$ ) and 6 identified as other (i.e. another gender identity, 1.4%,  $M_{age} = 19.67$ ,  $SD = 1.86$ ). 59.9% of the sample identified as Caucasian, 1.4% as Latino/Hispanic, 2.3% as Middle Eastern, 10.2% as African, 5% as Caribbean, 4.3% as South Asian, 2.5% as East Asian, 7.3% as Mixed, 3.6% as ‘Other’ background, and 3.6% chose not to report their ethnicity. Mean scores and standard deviations of each gender and ethnicity category in the different scales of the study are presented in the supplementary material (Table s1).

In line with previous work (Tamarit et al., 2022), we screened our initial data for inadequate responses (i.e. incomplete surveys), and only those participants who filled out 100% of the survey were included (i.e. missing data were not handled in our dataset).

## Materials

(IES-COVID19 (Vanaken et al., 2020)). The development of the IES-COVID19 was based on the Dutch version of the Impact of Events Scale (Brom & Kleber, 1985). The scale measures trauma-related symptoms of stress, and particularly short-term and long-term intrusion and avoidance effects of COVID-19. It consists of 15 items: Items 1, 4, 5, 6, 10, 11 and 14 form the Intrusion subscale (e.g. ‘I thought about it when I didn’t mean to’) and items 2, 3, 7, 8, 9, 12, 13 and 15 form the Avoidance subscale (e.g. ‘I stayed away from things that made me think about it’). Every item is rated on a 4-point scale, ranging between ‘not at all’ and ‘very much’, and ‘not at all’ and ‘very much’. The scale exhibited high internal consistency ( $\alpha = .88$ ).

! " (HSPS, Aron & Aron, 1997). This scale measures individual differences in sensory-processing sensitivity, which involves high levels of sensory sensitivity and arousability. It consists of 27 items which examine sensitivity to positive (e.g. ‘Are you deeply moved by the arts or music?’) and negative environments (e.g. ‘Are you easily overwhelmed by strong sensory input?’). Each item is rated on a 7-point Likert-type scale, ranging from ‘not at all’ to ‘very much’. The items of the scale showed high internal consistency ( $\alpha = .90$ ).

# \$ (BRS, Smith et al., 2008). This scale measures resilience in its basic meaning: to recover from stress (Agnes, 2005). Each item is scored on a 5-point Likert scale ranging from ‘not at all’ to ‘very much’. It consists of three positive statements (e.g. ‘I tend to bounce back quickly after hard times’) and three negative statements (e.g. ‘It is hard for me to snap back when something bad happens’). The scale showed good internal consistency ( $\alpha = .81$ ).

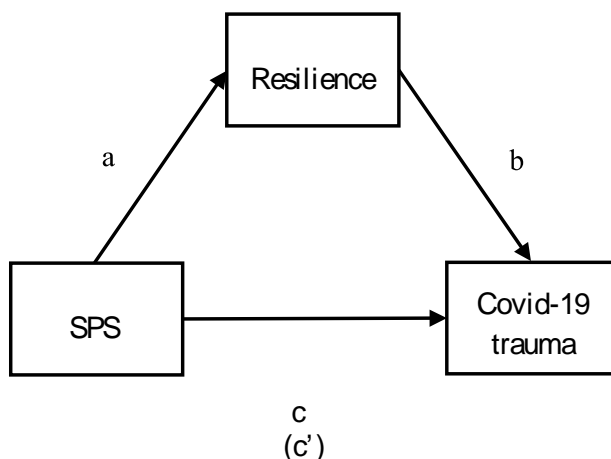
% (SWLS, Diener et al., 1985). This scale measures participants’ life satisfaction. It does not assess separate facets of satisfaction with life but instead allows participants to weigh these aspects, however, they choose. It involves five items (e.g. ‘In most ways my life is close to my ideal’) which are measured on a 7-point Likert scale ranging from ‘not at all’ to ‘very much’. The internal consistency of the items was high ( $\alpha = .86$ ).

## Procedure

The study took place in the UK. The data was collected using an online survey created with Qualtrics software ([www.qualtrics.com](http://www.qualtrics.com)). The survey was available between 19 November 2021 and 8 April 2022. During this period no lockdown measures were imposed, but the pandemic was still ongoing. The adult participants were mainly recruited from a Psychology department in a UK-based university in exchange for credits. Students accessed the study link through their university's research participation scheme website. The adolescent participants were recruited from schools and local athletic clubs. For these participants, emails were sent out to the headteachers of secondary schools in the area. The emails included information sheets explaining the study, and permission was asked to distribute the online survey to the students. After the headteachers signed the consent forms, the researchers created a virtual flyer with the link to the online survey and emailed it to teachers. Emails explaining the study were also sent to the coaches who were asked to forward the virtual flyer to the athletes'/players' parents/guardians to share with the former. The survey link was also put on several social media outlets, inviting adult and adolescent participants to take part. All participants gave informed consent virtually before filling out the demographic questions and the questionnaires presented above.

## Design

In line with Iimura (2022), this research involved two parts. First, descriptive statistics and correlation coefficients for the variables of the study were computed. The second part involved a mediation analysis which investigated the relationship between sensory-processing sensitivity (SPS), resilience (mediator), and COVID-19 trauma-related stress. Life satisfaction was not included in this analysis because this was not part of our hypotheses, and life satisfaction was not significantly related to COVID-19 trauma-related stress (see Results section); including it would have violated one of the main assumptions for the mediation analysis (MacKinnon et al., 2007). The analysis was performed through the SPSS macro PROCESS (Hayes, 2018), and the significance of total, direct, and indirect effects was tested via bootstrapping. A hypothetical model was examined (Figure 1). Figure 1 describes the steps of the analysis. To examine the indirect effect ( $a \times b$ ), a bootstrap analysis was conducted with 5000 bootstrap samples. The indirect effect would be considered statistically significant if the upper and lower limits of the 95% confidence intervals (CI) of the regression coefficient of the bootstrapping method did not include 0.



Mediation model proposed to test associations between SPS, resilience and COVID-19 trauma-related stress. The coefficient 'a' involves the partial regression coefficient between SPS and resilience; 'b' involves the partial regression between resilience and COVID-19 trauma-related stress; 'c' represents the partial regression between SPS and COVID-19 trauma-related stress with the mediator. The coefficient 'c' involves the coefficient in the model without the mediator.

## Results

Means and standard deviations for sensory-processing sensitivity (SPS), resilience (Resil), life satisfaction (SWL) and COVID-19 trauma-related stress (Covid-trauma) are presented in Table 1. A correlation analysis was performed to determine the association between these variables. SPS was negatively correlated with resilience and life satisfaction and positively correlated COVID-19 trauma-related stress and age. Resilience was positively correlated with life satisfaction and negatively correlated with COVID-19 trauma-related stress. Life satisfaction was not significantly related to COVID-19 trauma-related stress (see Table 1).

Means, Standard Deviations and Correlation Coefficients with Confidence Intervals

|                 |       |       | 2                       | 3                    | 4                       | 5                   |
|-----------------|-------|-------|-------------------------|----------------------|-------------------------|---------------------|
| 1. SPS          | 4.26  | .87   | -.47***<br>[-.54, -.39] | -.11*<br>[-.2, -.02] | .25***<br>[.16, .34]    | .11*<br>[.02, .20]  |
| 2. Resil        | 2.97  | .72   |                         | .36***<br>[.28, .44] | -.22***<br>[-.31, -.13] | -.08<br>[-.16, .02] |
| 3. SWL          | 20.67 | 6.49  |                         |                      | -.03<br>[-.12, .06]     | .02<br>[-.07, .11]  |
| 4. Covid-trauma | 21.88 | 14.92 |                         |                      |                         | .03<br>[-.06, .12]  |
| 5. Age          | 19.26 | 1.65  |                         |                      |                         |                     |

. Values in square brackets indicate the 95% confidence interval for each correlation. \*\*\*  $\leq .001$ , \*\*  $< .01$ , \*  $< .05$ . SPS = Sensory-processing sensitivity, Resil = Resilience, SWL = Life satisfaction, Covid-trauma = COVID 19 trauma-related stress



Independent sample t-tests were conducted to investigate differences in SPS, resilience, life satisfaction and COVID-19 trauma-related stress between adolescents (16–18-year-olds,  $n = 123$ ) and adults (19–25-year-olds,  $n = 318$ ). As shown on Table 2, adults had higher scores in SPS than adolescents ( $t = .001$ ). There were no other significant differences between the two groups in resilience, life satisfaction, and COVID-19 trauma-related stress (all  $p > .05$ ).

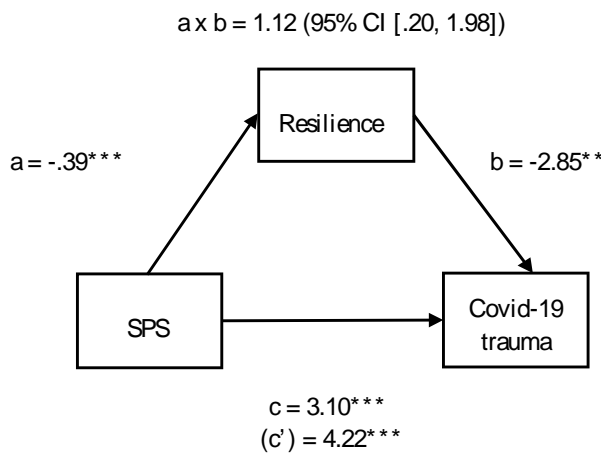
Differences Between Adolescents and Young Adults in SPS, Resilience, Life Satisfaction and COVID-19 Trauma-Related Stress.

|                   | Adolescents |       | Adults |       |       |         |
|-------------------|-------------|-------|--------|-------|-------|---------|
|                   |             |       |        | (439) |       | Cohen's |
| SPS               | 4.04        | .81   | 4.35   | .88   | −3.46 | <.001   |
| Resilience        | 3.05        | .66   | 2.94   | .74   | 1.41  | .16     |
| Life satisfaction | 20.14       | 6.44  | 20.88  | 6.51  | −1.07 | .28     |
| COVID-19 trauma   | 20.28       | 14.63 | 22.50  | 15.00 | −1.41 | .16     |

. SPS = Sensory-processing sensitivity, Covid-19 trauma = Covid-19 trauma-related stress

## Mediation analysis

A mediation analysis was run to investigate whether SPS (predictor) predicts COVID-19 trauma-related stress (outcome variable) and whether resilience (mediator) mediates this relationship. The model is presented on Figure 2.



Mediation model for associations between SPS, resilience, and COVID-19 trauma-related stress. Note \*\*  $p < .01$ , \*\*\*  $p \leq .001$ .

In step 1 of the model, the regression of SPS on COVID-19 trauma-related stress, ignoring the mediator, was significant,  $t(439) = 5.32$ ,  $p < .001$ . Step 2 showed that the regression of SPS on the mediator (resilience) was also significant,  $t(439) = -0.39$ ,  $p = .69$ . Step 3 showed that the

mediator (resilience), controlling for SPS, was significant,  $-2.85$ , (438)  $-2.64$ , .008. Step 4 of the analysis showed that when controlling for the mediator (resilience), SPS was still a significant predictor of COVID-19 trauma-related stress,  $3.10$ , (438)  $3.47$ , .001. The analysis revealed a significant indirect effect of SPS on COVID-19 trauma-related stress through resilience  $= 1.12$ , 95% BCa CI [.20, 1.98]. The standardised indirect effect was  $= .06$ , 95% BCa CI [.01, .11], representing a significant but relatively small effect size. The analysis showed that resilience partially mediated the relationship between SPS and COVID-19 trauma-related stress.

## Discussion

COVID-19 was experienced by many as a highly traumatic event with lasting effects (Harper & Neubauer, 2021). Our study builds and expands on Iimura's work (Iimura, 2022) by investigating the association between sensory-processing sensitivity (SPS) and the experience of COVID-19 as a traumatic event in relation to resilience and life satisfaction in a young people. Our first hypothesis was partially confirmed; we found that SPS was positively related, and resilience was negatively related to COVID-19 trauma-related stress. However, life satisfaction was not significantly related to COVID-19 trauma-related stress. With respect to our second hypothesis, we found that the relationship between SPS and COVID-19 trauma-related stress was partially mediated by resilience. These findings will be discussed in turn.

We found that being a highly sensitive person is related to higher levels of COVID-19 trauma-related stress, suggesting that sensory sensitivity can be a risk factor for trauma. Previous work with a Japanese sample revealed a positive association between SPS and COVID-19 stress in young people (Iimura, 2022). A main difference between our study and Iimura's is that we specifically explored the impact of COVID-19 as a traumatic event, given previous findings that COVID-19 may be linked to PTSD symptoms (Bridgland et al., 2021). Consistent with Iimura's findings, in our study the relationship between SPS and COVID-19 trauma-related stress was small. Moreover, participants' mean score in the IES-COVID19 was within the normal range and not indicative of PTSD symptoms (Horowitz et al., 1979). This could be because our study took place after the quarantine measures had been lifted the UK. As such measures can predict traumatic stress after lockdown restrictions are over, and traumatic symptoms persisted long-term after previous viral epidemics (Vanaken et al., 2020; Wu et al., 2009), it was imperative to investigate the aftereffects of COVID-19 during this period. An explanation of our finding is that highly sensitive youth may be more reactive to the traumatic consequences of the pandemic due to overstimulation when required to respond to excessive demands (Burgard et al., 2022). Indeed, the COVID-19 pandemic with its lockdowns, changes in everyday routines (e.g. school closures), switch to online learning, and isolation created extreme changes in adolescents' lives. Those higher in SPS may experience such changes as more distressing and thus present more traumatic symptoms compared to those who are less sensitive to environmental stimuli.

Nonetheless, being highly sensitive is not necessarily a predisposing factor for negative mental health outcomes (Iimura, 2022). Research shows that highly sensitive individuals have higher scores in cognitive tasks and are more responsive to interventions, indicating

that by reducing negative environmental contexts or increasing supportive ones (e.g. through therapeutic interventions) they can have equally good mental health outcomes to individuals who are less sensitive to environmental stimuli (Iimura, 2022; Jagiellowicz et al., 2011; Pluess & Boniwell, 2015).

Contrary to our hypothesis, we found no association between life satisfaction and COVID-19 trauma-related stress. Previous research showed that life satisfaction was negatively related with COVID-19-related worries (Satici et al., 2020). Such work took place in the beginning of the pandemic when individuals may have been more dissatisfied with their lives due to the uncertainty and social restrictions imposed during that period. Our study took place after the lockdown periods, when presumably people were more hopeful about returning to a normal way of life. This is reflected in participants' life satisfaction mean score which was neutral at this stage (Diener et al., 1985) and may explain the lack of association with COVID-19 trauma-related stress. Life satisfaction is a critical indicator of youth wellbeing (Proctor et al., 2008). As it is still unclear whether it has a stronger effect in times of crisis and immense stress or generally throughout one's life (Smyth et al., 2016), and the literature supports an association between life satisfaction and traumatic stress following natural disasters (e.g. Block et al., 2019), further research is needed to determine its relationship to the traumatic impact of the pandemic.

We also found a negative association between SPS and life satisfaction, which is in line with previous work (Costa-López et al., 2021). This finding could be due to several reasons. First, SPS can impact individuals' academic and professional performance and participation in leisure activities, all of which form important aspects of one's everyday life (Engel-Yeger & Dunn, 2011). Further, higher levels of SPS are related to inability to exhibit cognitive flexibility due to deep processing of environmental stimuli (Engel-Yeger et al., 2012). This may affect how people cope with everyday task and situations (Engel-Yeger & Rosenblum, 2021). Finally, SPS may be related to isolation, which was prevalent during the pandemic, and is further related to mental ill health and poor life satisfaction (Clair et al., 2021; Palgi et al., 2020). It may be that highly sensitive persons choose to spend more time in isolation to avoid overstimulation, and this adversely affects their quality of life.

We found that resilience was negatively related to COVID-19 trauma-related stress and partially mediated the relationship between SPS and COVID-19 trauma-related stress: while resilience influenced the relationship between SPS and COVID-19 trauma-related stress, the direct relationship between these two variables was still significant. This suggests that the association between sensory sensitivity and COVID-19 trauma-related stress may be multifaceted and explained further by other factors. Our finding offers support to Iimura's work (Iimura, 2022), who showed that resilience was negatively associated with COVID-19 stress and buffered the relationship between SPS and COVID-19 stress in a young Japanese sample, as well as previous findings with Japanese and Chinese youth that resilience can protect against the effects of COVID-19 (Iimura, 2022; Zhang et al., 2020). The congruence between our findings and those of Iimura suggests that resilience may serve as a protective factor for young people across diverse geographical settings and ethnic backgrounds, an issue that can be explored further in future research. From an applied perspective, our study makes important implications about ways to support young people so that they are not affected vicariously by trauma. First, our results highlight that policies and interventions should target young people's resilience, as this can in turn

influence how youth, particularly those who are sensitive to environmental stimuli, respond to highly distressing experiences. This involves investing in systems which are flexible and grounded on evidence-based prevention and intervention strategies. As an example, resilience-based interventions which consider developmental changes in adolescence and promote self-regulation and cognitive control can teach young people how to deal with and overcome adversity (see, Xing et al., 2023). Our findings further highlight the need for interventions that go beyond resilience to deal with traumatic stress. Previous work showed that peer support and peer groups, exercising, spending time in nature and engaging in creative activities and problem-focused coping can bolster young people's mental wellbeing during a traumatic event (Hussong et al., 2021; O'Brien et al., 2021; Rogers et al., 2021). Future research could explore what other factors can potentially explain the relationship between sensory sensitivity and COVID-19 trauma-related stress.

Our study has several limitations. Our participants were recruited through convenience sampling, mainly by advertising the study in the authors' academic department and schools and sports clubs in the area. Nonetheless, we used a large sample size, equal to Iimura's (2022). Our research utilised self-report questionnaires and as such it may involve cognitive bias (Paulhus et al., 1998). Only one-third of our sample comprised adolescents. Future research should examine the generalisability of our findings in a more homogenous sample. Given that SPS may be related to isolation, which was linked to a mental health decline during COVID-19, future research could explore the mediating role of isolation between SPS and COVID-19 trauma-related stress (Wang et al., 2020). As life satisfaction plays an important role in youth mental health and is associated with resilience (see, Tamarit et al., 2022), future research could investigate further its relationship with SPS and COVID-19-related trauma. Finally, we did not explore racial and gender differences in the relationship between SPS, life satisfaction, and COVID-19 trauma-related stress in our study. Given previous findings highlighting that girls and young women and young people from racial minorities have been disproportionality affected by COVID-19 (Hawks, 2023; Zolopa et al., 2022), future research could shed light into the negative mental health impact of COVID-19 on these populations.

To our knowledge, our study is the first to examine the psychological effect of COVID-19 as a traumatic event in relation to SPS in a young sample. Overall, we found SPS is negatively related to COVID-19 trauma-related stress and resilience partially mediates this relationship. As resilience allows individuals to be more adaptive to adverse situations (Ronen et al., 2016), and the current generation of young people has experienced a major life event with mental health consequences expected to linger in the future (Iordanou, 2023, Nadeem & Van Meter, 2023), our study suggests that targeting resilience especially in highly sensitive young people and investigating further other psychological factors, may be a way forward to safeguard wellbeing.

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## Data availability statement

The data that support the findings of this study are openly available in OSF at <http://doi.org/10.17605/OSF.IO/CP7RT>

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