Self-compassion and savouring buffer the impact of the first year of the COVID-19 on PhD students' mental health

Marine Paucsik, Christophe Leys, Gabriel Marais, Céline Baeyens, Rebecca Shankland

Marine Paucsik (Orcid ID: 0000-0002-9751-4985)

Self-compassion and savoring buffer the impact of the first year of the COVID-19 on PhD students' mental health

Short Running Title: Protective factors of PhD students' mental health

Marine Paucsik[*a] iD, Christophe Leys[b] iD, Gabriel Marais[c] iD, Céline Baeyens[a] iD & Rebecca Shankland[d,e] iD

[a]University Grenoble Alpes, LIP/PC2S, F-38000 Grenoble, France

[b]Univ. Libre de Bruxelles, Brussels, Belgium

[c]Univ. Lyon 1, CNRS, Laboratoire de Biométrie et Biologie Evolutive

[d]Chair of Economic Peace, Mindfulness, and Well-Being at Work, Grenoble Ecole de Management, 38000 Grenoble, France

[e]Univ. Lumière Lyon 2, Laboratory DIPHE (Development, Individual, Processes, Handicap, Education), 69676 Bron, France

ORCID:

Marine Paucsik: iD https://orcid.org/0000-0002-9751-4985

Christophe Leys: iD https://orcid.org/0000-0002-3832-3097

Gabriel Marais: iD https://orcid.org/0000-0003-2134-5967

Céline Baeyens: iD https://orcid.org/0000-0003-2422-4378

Rebecca Shankland: iD https://orcid.org/0000-0002-9182-5483

* Correspondence should be addressed to: marine.paucsik@univ-grenoble-alpes.fr or rebecca.shankland@univ-lyon2.fr

Self-compassion and savoring buffer the impact of the first year of the COVID-19 on PhD students' mental health

Short Running Title: Protective factors of PhD students' mental health

Abstract

Doctoral students face many challenges that were reinforced by COVID-19-related lockdowns. We assessed this impact over one year on doctoral students' depression, anxiety, stress, well-being, and doctoral engagement. We also investigated the potential protective role of self-compassion and savoring on mental health, well-being, and doctoral engagement. A total of 134 PhD students from several French universities responded to the three-time points of this longitudinal study. The results showed a significant increase in depression, anxiety and stress and a significant decrease in well-being and doctoral engagement during the first year of the pandemic. Self-compassion and savoring predicted lower levels of depression, anxiety, and stress, and higher levels of well-being over time. Savoring alone predicted higher doctoral engagement over time. This study reveals the significant impact of the pandemic year on the mental health of doctoral students, and the relevance of self-compassion and savoring as psychological resources to cope with adversity.

Keywords: PhD students, mental health, well-being, self-compassion, savoring, COVID-19 pandemic.

1. Introduction

The lockdowns caused by the COVID-19 pandemic in France represented an important challenge for doctoral students who are already at risk for mental health problems (e.g., Hazell et al., 2020; Marais et al., 2019; Storrie, Ahern, & Tuckett, 2010). The situation especially increased the difficulties that PhD students face during their thesis. Indeed, if students are motivated when they begin the process (Stubb, Pyhältö, & Lonka, 2010), research also shows that it is a difficult emotional experience which can generate high levels of stress, exhaustion, and depression (Kurtz-Costes, Helmke, & Ülküsteiner, 2006; Toews et al., 1993; Toews et al., 1997). PhD students need to adapt to the academic world (Juniper, Walsh, Richardson, & Morley, 2012), to the work environment such as the quality of the work space, the facilities, and the relationships (Caesens, Stinglhamber, & Luypaert, 2014; Juniper et al., 2012), maintain

a work-life balance (Juniper et al., 2012), while keeping motivation high to stay engaged in the dissertation for at least three years (Caesens et al., 2014). All these emotional and academic challenges affect their mental health and make them more vulnerable (Storrie et al., 2010). More specifically, a study showed that French PhD students had high levels of stress, depression, and anxiety (Marais et al., 2018; Haag et al., 2018), and that their average well-being score was significantly lower than that of a British reference sample (Juniper et al., 2012). This population seems therefore at risk of anxiety and depression disorders.

Recent studies have also revealed the impact of the COVID-19 pandemic on the mental health of the general population (for a review see Vindegaard & Benros, 2020). It has led to an increased number of psychological difficulties such as anxio-depressive disorders (Salari et al., 2020), or sleep disorders (Jahrami et al., 2021) that have impacted individuals' family, social, and professional lives (Trougakos, Chawla, & McCarthy, 2020). In France, all the university laboratories had to close during the first two lockdowns. The doctoral students had to set up a workplace at home, remain far from their friends and working relationships and from outside activities. Indeed, in France, curfews were established to limit the spread of the virus. These curfews started at 6 p.m., i.e., just after working hours, and ended the next morning. Many PhD students did not have the opportunity to go out. These sanitary measures changed every month, which further increased the uncertainty of the situation. Thus, the pandemic may have increased the difficulties usually encountered by PhD students by making their environment and future more insecure. This can have had a strong impact on their mental health as research has already shown correlations between dissatisfaction with the learning environment and stress, burnout, and anxiety among PhD students (Pyhältö, Stubb, & Lonka, 2009). Furthermore, isolation can be a deleterious factor for the motivation and support doctoral students need, especially because they may initially feel isolated from the university community or consider the relationship with the community as complicated (Bair & Haworth, 2006; Gardner, 2010; Gardner & Barnes, 2007; Pyhältö et al., 2009). As lockdown and curfews are associated with higher risk of psychological difficulties, focusing on individual psychological processes contributing to well-being and resilience seems important. To address these challenges, there appear to be promising protective psychological factors such as self-compassion and the ability to savor past, present, or future moments (Samios, Praskova, & Radlinska, 2021). These two factors have been shown to have a positive impact on individual psychological and subjective well-being, as well as on feelings of security, social connection and self-soothing (e.g., Matos et al., 2022; Samios et al., 2021; Yamaguchi et al., 2020), making them valuable resources during anxiety-provoking events like the COVID-19 pandemic.

Self-compassion refers to a kind and warm attitude toward oneself, based on self-acceptance and developed by focusing on one's resources to face the difficulties encountered (Neff, 2003). Self-compassion is characterized by three components: mindfulness, a sense of common humanity, and self-kindness. Self-compassion has been shown to reduce anxiety and depressive symptoms (Fong & Loi, 2020; Pauley & McPherson, 2010). Specifically, during the COVID-19, self-compassion was identified as a factor that reduced worry and fear, and increased well-being (Deniz, 2021; Guan et al., 2021; Li et al., 2021). However, to enhance well-being, another process named savoring may be useful, especially in times of reduced possibility to access to leisure, social relationships, and change from routines (Bryant & Veroff, 1984; Campbell, 1980; Keyes, 2002; Keyes & Haidt, 2003; Ryff, 1989).

Savoring, or the ability to recall satisfying events, to savor the present moment or to positively anticipate future events also contributes to mental well-being by encouraging the emergence and maintenance of positive emotions (Bryant, 2003). Savoring can be divided into three orientations. Anticipatory savoring involves looking forward to future events in order to generate positive feelings in the present. Reminiscent savoring involves thinking back to a pleasant event in order to generate positive emotions again. Finally, savoring the present moment occurs during a moment when one is fully aware of the pleasant and positive nature of the moment in order to intensify or prolong the positive feelings experienced (Bryant, 2003). Savoring thus involves active and positive regulation of emotions before and after they are generated, as well as the ability to reinforce and maintain these emotions (Bryant, 2003; Bryant & Veroff, 2007). This skill is still little explored, although some studies have already shown its effects on well-being (Jose, Lim, & Bryant, 2012), resilience (Smith & Hanni, 2017) or depression (Chen & Zhou, 2017). Few studies have investigated its benefits during the COVID-19- pandemic. Their results revealed the protective role of savoring on the decrease in positive affect experienced during the pandemic (Romm et al., 2021) and its predictive and protective role on COVID-related worries (Deng et al., 2021) . The "savouring" ability could therefore improve coping with lockdown by counteracting the tendency of dreading what will happen next.

In an increasing number of studies outline the benefits of self-compassion and savoring on mental health in an unselected sample (e.g., Kahrilas et al., 2020; MacBeth & Gumley, 2012), few studies have specifically focused on doctoral students, even though these strategies could be important protective variables on their own difficulties. The purpose of this study was

therefore to assess the impact of the three lockdowns on PhD students' mental health and engagement during their thesis, and to evaluate the protective role of self-compassion and savoring on depression, anxiety and stress. The main hypothesis was that depression, anxiety and stress scores would increase six months and one year after the first lockdown, while well-being and PhD engagement would decrease. The secondary hypothesis was that self-compassion and savoring at the start of the first lockdown would predict lower levels of depression, anxiety and stress symptoms, and higher levels of well-being and PhD engagement six months and one year after.

2. Materials and methods

2.1. Procedure

This study has been pre-registered on Open Science Framework (OSF; Paucsik et al., 2020) and was approved by the local university ethics committee (approval number: CER Grenoble Alpes-Avis-2020-05-01-01). Informed consent was given at the three measurement times of this online longitudinal study which collected data on three occasions at six-month intervals during the year 2020 and 2021. The study began on May 4, 2020, during the first lockdown in France. The second measurement time was on November 9, 2020, during the second lockdown and the last measurement time was on May 3, 2021, at the end of the last lockdown in France.

After giving their consent to participate, participants were assigned a unique identification number to access anonymously online questionnaires for each of the three assessment times, each of them including the same measures (see below). Participants received no financial compensation for their participation.

This research was carried out among PhD students in France. To obtain an effect for the multiple linear regression analyses with an average effect size (.62, i.e., Conrad et al., 2021; Hazell et al., 2020) and acceptable power (i.e., with alpha set at .016 with Bonferroni corrections), the sample size required was 131. Sensitivity analyses performed on G*Power indicated that with these parameters, effect sizes of d = .6 could be detected if they existed. We expected a high rate of dropouts based on the combination of the risk of dropout in online studies and in longitudinal studies, combined with the risk of student dropouts from the doctoral program (Bolger, Stadler, & Laurenceau, 2012; Litalien & Guay, 2015; Marais et al., 2017). Indeed, in France, 10 to 60% of doctoral students drop out without completing their doctorate

(Moguérou, Murdoch, & Paul, 2003).-Therefore, we aimed at including at least four times the number of participants needed, that is 533 PhD students.

The study was posted online through networks of PhD students as well as through 49 French universities that agreed to participate in the study.

2.2. Participants

A total of 568 participants were recruited for the first survey session. Eligibility criteria required that the participants were: 1) at least 18 years old; 2) currently enrolled in a doctoral program and affiliated with a French university; 3) fluent in French; and 4) certifying having read the informed consent and agreed to participate. The original sample included 343 females, 222 males, and 3 other-identified participants with an average age of 28.2 (SD=5.82; age range: 22 years - 71 years). Of these 568 participants, 134 (23.6%) of the participants responded to all three stages of the survey and were included in the analyses. This number of dropouts is identical to that observed in online longitudinal studies (e.g., Pierce et al., 2020; Planchuelo-Gómez et al., 2020; Wang et al., 2020). The flow chart of the different phases of the study with the number of participants at each stage is presented in Figure 1 and demographic characteristics are presented in Table 1. The final sample consisted of PhD students aged between 22 and 52 (M = 27.8, SD = 4.96) with a majority of women (69.4%). Among the participants, 29.9% were in the first year of their thesis, 31.3% in the second year, 23.1% in the third year, and 15.7% in the fourth year or more, and more than half of them were funded. Participants who completed the entire study (i.e., the three waves of measures) did not differ at baseline from participants who completed only one or two waves of the survey on age ($t(566)$ = -1.08, $p > .28$, $\eta^2 = .002$), gender ($t(566) = -1.1$, $p > .26$, $\eta^2 = .002$), grant ($t(566) = -0.44$, $p > .65$, $\eta^2 = .0004$), depression ($t(544) = -.78$, $p > .43$, $\eta^2 = .001$), anxiety ($t(544) = -1.02$, $p > .3$, $\eta^2 = .002$), stress ($t(544) = -1.35$, $p > .17$, $\eta^2 = .003$), PhD engagement ($t(479) = .06$, $p > .94$, $\eta^2 = 0$), self-compassion ($t(516) = -.95$, $p > .33$, $\eta^2 = .002$), and savoring ($t(486) = 1.85$, $p > .06$, $\eta^2 = .007$).

Insert Figure 1 about here

2.3. Measures

All the answers were recorded from the Qualtrics platform. The order of the questionnaires was the same and participants had to answer all the questions, to reduce missing data..

Sociodemographic Characteristics. Respondents reported demographic characteristics including their age, self-identified gender (man, women or other), their marital status, their place and condition of living, their university, the year of enrollment (1st, 2nd, 3rd, 4th or more), and the presence or not of a grant during their thesis.

Depression, Anxiety and Stress. Symptoms of depression, anxiety, and stress were assessed using the French version of the Depression, Anxiety and Stress Scale (DASS-21, Lovibond & Lovibond, 1995). The DASS-21 is a self-administered questionnaire that measures the severity of depression (e.g., I couldn't seem to feel anything positive), anxiety (e.g., I worried about situations in which I might panic and make a fool of myself), and stress (e.g., I had trouble calming down) during the past week. Each item is scored from 0 (did not apply to me at all in the past week) to 3 (applied to me very often or most of the time in the past week). Reliability was checked by Cronbach's α for the measurement items of the three subscales. They were .88 for depression, .84 for anxiety, and .88 for stress at the first measure, .87 for depression, .80 for anxiety and .87 for stress at the second measure and .89 for depression, .82 for anxiety and .87 for stress at the last one.

Well-being. Well-being was measured with the French version of the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS, Tennant et al., 2007). This self-administered instrument covers both affective constructs, including the experience of happiness (e.g., *I've been feeling cheerful*), and constructs representing psychological functioning and self-realization (e.g., *I've been feeling good about myself*). The WEMWBS comprises 14 items related to the previous two weeks, with responses on a 5-point Likert scale ranging from 1 (never) to 5 (always), and a total scale score is calculated by summing the 14 individual item scores. The minimum score is 14 and the maximum is 70. Reliability was verified by Cronbach's α for measure items and was .86 for the first measure, .91 for the second, and .88 for the third.

PhD engagement. The French version of the *Utrecht Work Engagement Scale* for students (UWES-9S) developed by Schaufeli et al. (2006) was used to measure study engagement. The

questionnaire was slightly modified to make it clear that we were measuring doctoral engagement and not any other training that followed by PhD students. In the questionnaire, the term "study" was thus replaced by "thesis". The 9-item questionnaire is rated on a six-point Likert-type agreement scale ranging from 0 (never) to 6 (always). It measures the three components of study engagement: vigor (e.g., "*When I am doing my work as a student, I feel bursting with energy*"), dedication (e.g., "*I am proud of my studies*"), and absorption (e.g., "*I get carried away when I am studying*"). Reliability was verified by Cronbach's α for measure items and was .91 for the first measure, .92 for the second, and .90 for the third.

Self-compassion. Self-compassion was measured with the French version of the Self-Compassion Short Form Scale (SCS-SF, Neff, 2003b). The SCS-SF is a composed of six subscales with a total of 12 items. The six-sub scales assess self-compassion (i.e., self-kindness, self-judgment, common humanity, isolation, mindfulness, and overidentification). Self-kindness refers to the tendency to extend kindness and understanding toward oneself when feeling emotional pain or stress (*e.g., When I'm going through a very hard time, I give myself the caring and tenderness I need).* Self-judgment reflects the tendency to be self-critical, disapproving, and intolerant toward one's own flaws and difficult experiences *(e.g., I'm intolerant and impatient toward those aspects of my personality I don't like).* Common humanity is an ability to recognize that difficult emotional feelings or inadequacy and failure are universal human experience (*e.g., I try to see my failings as part of the human condition).* Isolation dimension measures feelings of loneliness, separation, and disconnection from others at times of failure or distress (*e.g., When I fail at something that's important to me, I tend to feel alone in my failure*). Mindfulness is about adopting an attitude of acceptance and openness to experience whatever unpleasant thoughts or emotions are present (e.g., *When something painful happens I try to take a balanced view of the situation).* Overidentification refers to the tendency to become excessively immersed or consumed by negative feelings (*e.g., When I'm feeling down, I tend to obsess and fixate on everything that's wrong).* In this study, the scale reliability was good with a Cronbach's alpha of .84 for the total scale at the first measure, .84 for the second, and .84 for the third.

Savoring. Savoring was assessed with the French version of the Savoring Beliefs Inventory (SBI, Golay, Thonon, Nguyen, Fankhauser, & Favrod, 2018). The inventory is a self-assessment questionnaire composed of 24 items to evaluate attitudes toward savoring positive experience within three temporal orientations: the past (reminiscence), the present moment (present enjoyment), and the future (anticipation). Each of these three subscales is represented by 8 items. Each item is rated on a 7-point Likert scale ranging from 1 (strongly disagree) to 7

(strongly agree). The total score of the SBI is calculated by subtracting the total score of negative items from the total score of positive items. The three subscales are calculated in the same fashion. The Anticipating pleasure subscale measures savoring a future positive event beforehand (e.g., *Before a good thing happens, I look forward to it in ways that give me pleasure in the present*). The Present moment pleasure subscale measures enjoying positive events when they occur (e.g., *I know how to make the most of a good time)*. Finally, the Reminiscing pleasure subscale measures recalling past positive events after they have occurred (e.g., *I enjoy looking back on happy times from my past)*. Reliability was verified by Cronbach's α for measure items and was .92 for the first measure, .93 for the second, and .93 for the third.

2.4. Data analysis plan

Data were analyzed using JAMOVI Version 1.2.27 (The Jamovi Project, 2020). First, one-way ANCOVA and bivariate correlations were conducted to investigate associations between demographic and outcomes variables. We had planned to perform a Games-Howell multiple comparison correction when the ANOVAs were significant to control for alpha risk. To investigate our main and second hypothesis, we performed several one-way and repeated measures ANOVAs. For the oneway ANOVA, we conducted the Welch ANOVA by default (Delacre, Leys, Mora, & Lakens, 2020). For the repeated measures ANOVA, Greenhouse-Geisser corrections were applied when sphericity test was significant. Given the sample size, we kept the parametric solution even when the assumption of normality was not met since parametric test stays robust enough (Leys & Schumann, 2010).

3. Results

3.1. Descriptive statistics and correlations at baseline

We conducted oneway ANCOVAs with gender, personal living situation, type of housing, thesis year and grant at baseline set as covariate with depression, anxiety, stress, wellbeing, engagement and self-compassion and savoring set a dependent variable. Concerning the type of housing, we grouped the persons living in a house without a terrace or garden (N=2) with those having a terrace and garden (N=42). The results did not show a significant effect of gender, personal living situation, type of housing and thesis year and grant on all the outcomes.

Bivariate correlations between age, depression, anxiety, stress, well-being, engagement, savoring and self-compassion at baseline are presented in Table 2.

Insert Table 2 about here

3.2.Evolution of mental health, well-being, PhD engagement, self-compassion and savoring during the three lockdowns in France

As shown in Table 3, the results of repeated measures ANOVAs showed a significant increase in symptoms of depression, anxiety, and stress as well as a significant decrease in engagement and savoring over time, with small to large effect sizes. The results showed that self-compassion remains stable over time. Post-hoc analyses showed that depression and anxiety scores increased significantly between the first and third and the second and third lockdown and stress scores increased significantly between the first, second and third lockdowns. Results also showed that engagement and savoring significantly decreased between the first, second and third lockdown. During the first lockdown, 9.5% of the PhD students presented symptoms of severe to very severe depression, and this increased to 34.8% after the third lockdown. Concerning anxiety, 14.7% had severe to very severe anxiety symptoms during the first lockdown, and this increased to 23.5% after the third lockdown. Finally, 13.4% had severe to very severe stress symptoms during the first lockdown, and this increased to 22.7% after the third lockdown.

As age was correlated with well-being, we included this covariate in the following well-being analyses. Results showed that well-being decrease during the three lockdown by controlling age, $F(2,178.4)= 5.09$, $p < .01$, $\eta^2_p = .04$.

To explore interaction between age and time on well-being, we computed two new variables: one linear contrast of time for well-being (-1,0,1) and a quadratic contrast of time on well-being (-1, 2, -1). The results showed that age significantly predict the linear contrast $\beta = -.483$ (SE = .157), $p = .003$, but not the quadratic contrast ($p = .933$). This means that wellbeing decreases with age.

3.3. Impact of self-compassion and savoring on mental health, well-being and PhD engagement

To test our second hypothesis, we conducted two repeated measures ANCOVAs with self-compassion and savoring at T1 set as covariate with the three time-points set as intrasubject independent variable and depression, anxiety, stress, wellbeing, doctoral engagement, set as dependent variables.

The results of the repeated measures ANOVAs showed a significant effect of self-compassion on depression across time, $F(1,127)= 33.3$, $p < .001$, $\eta^2_p = .20$, as well as on anxiety, $F(1,127)= 33.7$, $p < .001$, $\eta^2_p = .20$, on stress, $F(1,127)= 30.2$, $p < .001$, $\eta^2_p = .19$, and on well-being, $F(1,127)= 45.4$, $p < .001$, $\eta^2_p = .27$. However, the results did not show a significant effect of self-compassion on doctoral engagement.

Concerning savoring, there was a significant effect on depression $F(1,127)= 41.3$, $p < .001$, $\eta^2 p = .24$, anxiety, $F(1,127)= 27.7$, $p < .001$, $\eta^2_p = .17$, stress, $F(1,127)= 17$, $p < .001$, $\eta^2_p = .11$, well-being, $F(1,122)= 43.1$, $p < .001$, $\eta^2_p = .26$, and on doctoral engagement $F(1,122)= 5.43$, $p < .05$, $\eta^2_p = .04$. These results revealed that the higher the PhD students' self-compassion and savoring scores, the lower their symptoms of depression, anxiety, and stress and the higher their well-being levels after one year. Furthermore, these results showed that the higher the PhD students' ability to savor present, past or future life events, the more engaged they were in their PhD work during the year.

3. Discussion

In line with studies evaluating the impact of the COVID-19 pandemic on the mental health of individuals and PhD students (e.g., Byrom et al., 2020; Hazell et al., 2020; Jackman et al., 2021), this study evaluated the impact of one year of the pandemic in France on the mental health of PhD students and the role of two protective factors: self-compassion and savoring. Based on survey data obtained during the first, second and third lockdown in France, our findings demonstrate the impact of the COVID-19 pandemic on the mental health and well-being of PhD students. Consistent with the literature, depression, anxiety, and stress scores were elevated during the first lockdown and increased significantly during the subsequent lockdowns

(Essadek & Rabeyron, 2020; Grubic, Badovinac, & Johri, 2020). If we compare our results to studies using the DASS21 as a reference scale we can observe that our results are superior to those of other populations measured before the COVID-19 (Norton, 2007; Zanon et al., 2021) or during the COVID-19 (Planchuelo-Gómez et al., 2020; Vaughan, Edwards, & MacIntyre, 2020). Indeed, after the third lockdown, 34.8% of the PhD students suffered from severe to very severe depression, 23.5% reported severe to very severe anxiety symptoms, and 22.7% suffered from severe to very severe stress symptoms. These scores are significantly higher than those observed on a similar population during other periods (Ibrahim et al., 2013; Verger et al., 2010).

Regarding well-being, our results revealed a significant effect time and of age. Indeed, our results show that well-being decreases with the age of the PhD students. The evolution of well-being with age has already been shown in multiple studies (Blanchflower & Oswald, 2008; Springer, Pudrovska, & Hauser, 2011; Stone et al., 2010). However, as multiple studies show, we expected to find a quadratic effect of age on well-being. Indeed, well-being tends to decrease at its maximum in middle age and to be more important during the first and last years of life (Blanchflower & Oswald, 2008). In our study, our results reveal a linear effect of age on well-being, which can be explained by the age of our population between 22 and 52 years. Studies show that it is precisely during this period that well-being tends to decrease before increasing again. In this age group, individuals with children are more likely to have had them at home, especially during lockdowns when they had to continue to manage their work and other domestic tasks, which may have contributed to higher levels of burnout (Brooks et al., 2020). In addition, research shows that having children under the age of five is a risk factor for parental burnout (Mikolajczak et al., 2018). All these elements - even though not exhaustive - could thus explain the effect of age on well-being in our population. To date, longitudinal research on the evolution of well-being over the life course is still necessary to better understand and identify these factors (Blanchflower & Oswald, 2008).

Finally, all three lockdowns also negatively and significantly impacted PhD students' engagement in their doctoral thesis, especially after the third lockdown compared to the first and second ones. These results are consistent with other research that has evaluated the impact of lockdowns on work engagement (Pulido-Martos, Cortés-Denia, & Lopez-Zafra, 2021).

In addition, the COVID-19 pandemic has profoundly impacted the research community and increased the challenges commonly faced by PhD students (Sharma et al., 2020). For example, while doctoral students typically have only three years to complete their work, a delay in obtaining rapid ethical approval to conduct research was observed during the pandemic (Ma et al., 2020). Furthermore, perceived job control may have been highly impacted during the

epidemic, and thus have contributed to the decrease in motivation of doctoral students over the year, and in well-being, as past research has shown that researchers' well-being is associated to perceived job control (Guthrie et al., 2017). All these elements support the importance of focusing on the well-being of doctoral students and assessing their psychological resources to cope with these difficulties. This is why this research also focused on two promising protective factors: self-compassion and savoring.

In line with other studies (Gutiérrez-Hernández et al., 2021; Mohammadpour et al., 2020), our study revealed that self-compassion played a protective role against the deleterious effects of lockdowns on symptoms of depression, anxiety, and stress, and on well-being. Furthermore, levels of self-compassion were not impacted by the lockdowns: the scores remained stable over time during the 12 months following the first lockdown. These results suggest that self-compassion might be a trait that is quite stable over time and which allows to cope with difficulties by promoting an adaptive down regulation of negative emotion (Leary et al., 2007; Waring & Kelly, 2019), reducing the risk of depression (e.g., MacBeth & Gumley 2012; Raes, 2011; Van Dam et al. 2011), anxiety (Neff 2003b), and use of dysfunctional emotional regulation strategies such as rumination or suppression thought (Neff & Vonk, 2009).

Regarding savoring, our results showed that it predicted lower levels of symptoms of depression, anxiety and stress, and greater well-being and PhD engagement. Contrary to self-compassion, savoring allows for an active up-regulation of positive emotions before and after an event, and enhances positive emotions in the present moment (Bryant, 2003; Bryant & Veroff, 2007). In line with past research, savoring was associated with greater well-being (Bryant, 2003; Quoidbach et al., 2010), and also helped decrease symptoms of depression and anxiety (Chiu et al., 2020; Irvin et al.,, 2020; Straszewski & Siegel, 2018). However, our results also showed that savoring significantly decreased over time. These results can be explained by the successive lockdowns, which involved closing the laboratories and teleworking, thus reducing social interactions, and thus perceived social support (Pulido-Martos et al., 2021). Indeed, previous research has shown the important role of social support on savoring by allowing the sharing of positive experiences and emotions (Feeney & Collins, 2015; Wilson, Weiss, & Shook, 2020). Other variables could explain these results, such as hopelessness for example, but no research has yet been conducted on this topic.

Although our results shed light on the influence of repeated lockdowns on PhD students, some limitations need to be considered. First, we did not consider enough sociodemographic factors that could moderate the results, such as the professional situation of PhD students, as some of them work in parallel with their thesis, or the family situation, as some PhD students

also had to take care of their children while teleworking, which represents another potential burden (Griffith, 2020; Hessami et al., 2020; Vigouroux et al., 2021). Having a history of psychiatric difficulties is also a vulnerability factor identified (for a review, see Vindegaard & Benros, 2020) that was not investigated. Finally, research showed that individuals who contracted the COVID-19 or knew someone infected by the COVID-19 were also at risk for mental health problems (Browning et al., 2021).

Second, the study was based on self-reported measures which can be biased (e.g., social desirability), and raises concerns about shared method variance (Podsakoff et al., 2003). It would be relevant to use complementary physiological and ecological measures. For example, measures targeting emotional regulation with experience sampling methods (ESM) would provide a clearer understanding of the impact of self-compassion and savoring on symptoms of depression, anxiety, and stress, and on well-being. These measures would therefore provide a more accurate assessment of how self-compassion and savoring promote emotional regulation and how this contributes to better daily functioning (Inwood & Ferrari, 2018; Svendsen et al., 2016).

Finally, these findings support group-based self-compassion and savoring interventions for PhD students to create supportive interpersonal contexts in which PhD students can share their difficulties and identify with peers, thereby enhancing their level of self-compassion and promoting greater resilience in the face of adversity (Waring & Kelly, 2019). These interventions can also take place online as recent research showed that online interventions also decrease psychological distress and increase positive emotion sharing, resilience, and the various factors they target such as self-compassion or savoring (Brouzos et al., 2021; Finlay-Jones, Kane, & Rees, 2017; Yu et al., 2020).

4. Conclusion

Although levels of depression, anxiety and stress among PhD students significantly increased during the year of the pandemic in France, this research sheds light on the importance of fostering protective mental health factors such as self-compassion and savoring. As previous research has shown, together, these two factors allow for flexible regulation of negative and positive emotions, promoting better coping strategies to deal with difficult events. The present research contributes to the previous findings. It reveals the importance of developing the ability to savor and experience self-compassion in times of crisis. The results of this study also shed

light on the protective role of self-compassion by revealing its stability over time, even in the face of adversity, making it an important and promising psychological resource to develop.

References

Blanchflower, D. G., & Oswald, A. J. (2008). Is well-being U-shaped over the life cycle? *Social Science & Medicine*, *66*(8), 1733–1749. https://doi.org/10.1016/J.SOCSCIMED.2008.01.030

Bolger, N., Stadler, G., & Laurenceau, J.-P. (2012). Power analysis for intensive longitudinal studies. In M. . Mehl & T. S. Conner (Eds.), *Handbook of research methods for studying daily life* (pp. 285–301). The Guilford Press.

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020, March 14). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*, Vol. 395, pp. 912–920. https://doi.org/10.1016/S0140-6736(20)30460-8

Brouzos, A., Vassilopoulos, S. P., Baourda, V. C., Tassi, C., Stavrou, V., Moschou, K., & Brouzou, K. O. (2021). "Staying Home – Feeling Positive": Effectiveness of an on-line positive psychology group intervention during the COVID-19 pandemic. *Current Psychology 2021*, 1–13. https://doi.org/10.1007/S12144-021-01613-X

Browning, M. H. E. M., Larson, L. R., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L., … Alvarez, H. O. (2021). Psychological impacts from COVID-19 among university students: Risk factors across seven states in the United States. *PLOS ONE*, *16*(1), e0245327. https://doi.org/10.1371/JOURNAL.PONE.0245327

Bryant, F. B. (2003). Savoring Beliefs Inventory (SBI): A scale for measuring beliefs about savouring. *Journal of Mental Health*, *12*(2), 175–196. https://doi.org/10.1080/0963823031000103489

Bryant, F. B., & Veroff, J. (2007). *Savoring, a New Model of Positive Experience*. Mahwah: Lawrence Erlbaum Associates Inc.

Byrom, N. C., Dinu, L., Kirkman, A., & Hughes, G. (2020). Predicting stress and mental wellbeing among doctoral researchers. *https://doi-org/10.1080/09638237.2020.1818196*. https://doi.org/10.1080/09638237.2020.1818196

Chen, J., & Zhou, L. (2017). Savoring as a moderator between positive life events and hopelessness depression. *Social Behavior and Personality*, *45*(8), 1337–1344.

https://doi.org/10.2224/SBP.6235

Chiu, H. T., Yee, L. T. S., Kwan, J. L. Y., Cheung, R. Y. M., & Hou, W. K. (2020). Interactive association between negative emotion regulation and savoring is linked to anxiety symptoms among college students. *Journal of American College Health*, *68*(5), 494–501. https://doi.org/10.1080/07448481.2019.1580712

Conrad, R. C., Hahm, H., Koire, A., Pinder-Amaker, S., & Liu, C. H. (2021). College student mental health risks during the COVID-19 pandemic: Implications of campus relocation. *Journal of Psychiatric Research*, *136*, 117–126. https://doi.org/10.1016/j.jpsychires.2021.01.054

Delacre, M., Leys, C., Mora, Y. L., & Lakens, D. (2020). Taking parametric assumptions seriously: Arguments for the use of welch's f-test instead of the classical f-test in one-way ANOVA. *International Review of Social Psychology*, *32*(1). https://doi.org/10.5334/IRSP.198

Deng, W., Gadassi Polack, R., Creighton, M., Kober, H., & Joormann, J. (2021). Predicting Negative and Positive Affect During COVID-19: A Daily Diary Study in Youths. *Journal of Research on Adolescence*, *31*(3), 500–516. https://doi.org/10.1111/JORA.12646

Deniz, M. E. (2021). Self-compassion, intolerance of uncertainty, fear of COVID-19, and well-being: A serial mediation investigation. *Personality and Individual Differences*, *177*, 110824. https://doi.org/10.1016/J.PAID.2021.110824

Essadek, A., & Rabeyron, T. (2020). Mental health of French students during the Covid-19 pandemic. *Journal of Affective Disorders*, *277*, 392–393. https://doi.org/10.1016/J.JAD.2020.08.042

Feeney, B. C., & Collins, N. L. (2015). A New Look at Social Support: A Theoretical Perspective on Thriving Through Relationships. *Personality and Social Psychology Review*, *19*(2), 113–147. https://doi.org/10.1177/1088868314544222

Finlay-Jones, A., Kane, R., & Rees, C. (2017). Self-Compassion Online: A Pilot Study of an Internet-Based Self-Compassion Cultivation Program for Psychology Trainees. *Journal of Clinical Psychology*, *73*(7), 797–816. https://doi.org/10.1002/jclp.22375

Fong, M., & Loi, N. M. (2020). The Mediating Role of Self-compassion in Student Psychological Health. *Https://doi-org /10.1111/Ap.12185*, *51*(6), 431–441. https://doi.org/10.1111/AP.12185

Golay, P., Thonon, B., Nguyen, A., Fankhauser, C., & Favrod, J. (2018). Confirmatory factor analysis of the French version of the savoring beliefs inventory. *Frontiers in Psychology*,

9(FEB), 181. https://doi.org/10.3389/fpsyg.2018.00181

Griffith, A. K. (2020). Parental Burnout and Child Maltreatment During the COVID-19 Pandemic. *Journal of Family Violence 2020*, 1–7. https://doi.org/10.1007/S10896-020-00172-2

Grubic, N., Badovinac, S., & Johri, A. M. (2020). Student mental health in the midst of the COVID-19 pandemic: A call for further research and immediate solutions: *Https://doi-org/10.1177/0020764020925108*, *66*(5), 517–518. https://doi.org/10.1177/0020764020925108

Guan, F., Wu, Y., Ren, W., Zhang, P., Jing, B., Xu, Z., … He, J. (2021). Self-compassion and the Mitigation of Negative Affect in the Era of Social Distancing. *Mindfulness 2021*, *1*, 1–12. https://doi.org/10.1007/S12671-021-01674-W

Guthrie, S., Lichten, C. A., van Belle, J., Ball, S., Knack, A., & Hofman, J. (2017). Understanding mental health in the research environment: A Rapid Evidence Assessment. *Understanding Mental Health in the Research Environment: A Rapid Evidence Assessment*. https://doi.org/10.7249/RR2022

Gutiérrez-Hernández, M. E., Fanjul, L. F., Díaz-Megolla, A., Reyes-Hurtado, P., Herrera-Rodríguez, J. F., Enjuto-Castellanos, M. del P., & Peñate, W. (2021). COVID-19 Lockdown and Mental Health in a Sample Population in Spain: The Role of Self-Compassion. *International Journal of Environmental Research and Public Health 2021, Vol. 18, Page 2103*, *18*(4), 2103. https://doi.org/10.3390/IJERPH18042103

Haag, P., Shankland, R., Osin, E., Boujut, Cazalis, F., Bruno, A. S., … Gay, M. C. (2018). Stress perçu et santé physique des doctorants dans les universités françaises. *Pratiques Psychologiques*, *24*(1), 1–20. https://doi.org/10.1016/J.PRPS.2017.04.005

Hazell, C. M., Chapman, L., Valeix, S. F., Roberts, P., Niven, J. E., & Berry, C. (2020a). Understanding the mental health of doctoral researchers: a mixed methods systematic review with meta-analysis and meta-synthesis. *Systematic Reviews 2020 9:1*, *9*(1), 1–30. https://doi.org/10.1186/S13643-020-01443-1

Hazell, C. M., Chapman, L., Valeix, S. F., Roberts, P., Niven, J. E., & Berry, C. (2020b). Understanding the mental health of doctoral researchers: a mixed methods systematic review with meta-analysis and meta-synthesis. *Systematic Reviews 2020 9:1*, *9*(1), 1–30. https://doi.org/10.1186/S13643-020-01443-1

Hessami, K., Romanelli, C., Chiurazzi, M., & Cozzolino, M. (2020). COVID-19 pandemic and maternal mental health: a systematic review and meta-analysis. *Journal of Maternal-Fetal and Neonatal Medicine*. https://doi.org/10.1080/14767058.2020.1843155

Ibrahim, A. K., Kelly, S. J., Adams, C. E., & Glazebrook, C. (2013). A systematic review of studies of depression prevalence in university students. *Journal of Psychiatric Research*, *47*(3), 391–400. https://doi.org/10.1016/J.JPSYCHIRES.2012.11.015

Inwood, E., & Ferrari, M. (2018). Mechanisms of Change in the Relationship between Self-Compassion, Emotion Regulation, and Mental Health: A Systematic Review. *Applied Psychology: Health and Well-Being*, *10*(2), 215–235. https://doi.org/10.1111/aphw.12127

Irvin, K. M., Bell, D. J., Steinley, D., & Bartholow, B. D. (2020). The thrill of victory: Savoring positive affect, psychophysiological reward processing, and symptoms of depression. *Emotion*. https://doi.org/10.1037/EMO0000914

Jackman, P. C., Jacobs, L., Hawkins, R. M., & Sisson, K. (2021). Mental health and psychological wellbeing in the early stages of doctoral study: a systematic review, 1–21. https://doi.org/10.1080/21568235.2021.1939752

Jahrami, H., BaHammam, A. S., Bragazzi, N. L., Saif, Z., Faris, M., & Vitiello, M. V. (2021). Sleep problems during the COVID-19 pandemic by population: A systematic review and meta-analysis. *Journal of Clinical Sleep Medicine*, *17*(2), 299–313. https://doi.org/10.5664/JCSM.8930/SUPPL_FILE/JCSM.8930.DS001.PDF

Jones, M. (2013). Issues in doctoral studies -forty years of journal discussion: Where have we been and where are we going? *International Journal of Doctoral Studies*, *8*(1), 83–104. https://doi.org/10.28945/1871

Jose, P. E., Lim, B. T., & Bryant, F. B. (2012). Does savoring increase happiness? A daily diary study, *7*(3), 176–187. https://doi.org/10.1080/17439760.2012.671345

Kahrilas, I. J., Smith, J. L., Silton, R. L., & Bryant, F. B. (2020). Savoring the moment: A link between affectivity and depression. *International Journal of Wellbeing*, *10*(2), 19–36. https://doi.org/10.5502/IJW.V10I2.779

Leary, M. R., Tate, E. B., Adams, C. E., Allen, A. B., & Hancock, J. (2007). Self-compassion and reactions to unpleasant self-relevant events: The implications of treating oneself kindly. *Journal of Personality and Social Psychology*, *92*(5), 887–904. https://doi.org/10.1037/0022-3514.92.5.887

Leys, C., & Schumann, S. (2010). A nonparametric method to analyze interactions: The adjusted rank transform test. *Journal of Experimental Social Psychology*, *46*(4), 684–688. https://doi.org/10.1016/J.JESP.2010.02.007

Li, A., Wang, S., Cai, M., Sun, R., & Liu, X. (2021). Self-compassion and life-satisfaction among Chinese self-quarantined residents during COVID-19 pandemic: A moderated

mediation model of positive coping and gender. *Personality and Individual Differences*, *170*, 110457. https://doi.org/10.1016/J.PAID.2020.110457

Litalien, D., & Guay, F. (2015). Dropout intentions in PhD studies: A comprehensive model based on interpersonal relationships and motivational resources. *Contemporary Educational Psychology*, *41*, 218–231. https://doi.org/10.1016/J.CEDPSYCH.2015.03.004

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, *33*(3), 335–343. https://doi.org/10.1016/0005-7967(94)00075-U

Ma, X., Wang, Y., Gao, T., He, Q., He, Y., Yue, R., … Tang, J. (2020). Challenges and strategies to research ethics in conducting COVID-19 research. *Journal of Evidence-Based Medicine*, *13*(2), 173–177. https://doi.org/10.1111/JEBM.12388

MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review*, *32*(6), 545–552. https://doi.org/10.1016/j.cpr.2012.06.003

Marais, G., Shankland, R., Haag, P., Fiault, R., & Juniper, B. (2017). A positive psychology study and intervention on the well-being of FrenchPhD students in biology . *PsyArxiv*. Retrieved from https://psyarxiv.com/rht94/

Matos, M., McEwan, K., Kanovský, M., Halamová, J., Steindl, S. R., Ferreira, N., … Gilbert, P. (2022). Compassion Protects Mental Health and Social Safeness During the COVID-19 Pandemic Across 21 Countries. *Mindfulness 2022*, *23*, 1–18. https://doi.org/10.1007/S12671-021-01822-2

Mikolajczak, M., Raes, M. E., Avalosse, H., & Roskam, I. (2018). Exhausted Parents: Sociodemographic, Child-Related, Parent-Related, Parenting and Family-Functioning Correlates of Parental Burnout. *Journal of Child and Family Studies*, *27*(2), 602–614. https://doi.org/10.1007/s10826-017-0892-4

Moguérou, P., Murdoch, J., & Paul, J.-J. (2003). Les déterminants de l'abandon en thèse : étude à partir de l'enquête Génération 98 du Céreq (2003 Marseille: Céreq, Ed.). *Les Données Longitudinales Dans l'analyse Du Marché Du Travail*, pp. 479–490. Marseille: Céreq.

Mohammadpour, M., Ghorbani, V., Khoramnia, S., Ahmadi, S. M., Ghvami, M., & Maleki, M. (2020). Anxiety, self-compassion, gender differences and COVID-19: Predicting self-care behaviors and fear of COVID-19 based on anxiety and self-compassion with an

emphasis on gender differences. *Iranian Journal of Psychiatry*, *15*(3), 213–219. https://doi.org/10.18502/ijps.v15i3.3813

Norton, P. J. (2007). Depression Anxiety and Stress Scales (DASS-21): Psychometric analysis across four racial groups, *20*(3), 253–265. https://doi.org/10.1080/10615800701309279

Paucsik, M., Leys, C., Marais, G., Celine, B., & Shankland, R. (2020). *Lockdown and PhD Student*. 17. https://doi.org/none

Pauley, G., & McPherson, S. (2010). The experience and meaning of compassion and self-compassion for individuals with depression or anxiety. *Psychology and Psychotherapy: Theory, Research and Practice*, *83*(2), 129–143. https://doi.org/10.1348/147608309X471000

Pierce, M., Hope, H., Ford, T., Hatch, S., Hotopf, M., John, A., … Abel, K. M. (2020). Mental health before and during the COVID-19 pandemic: a longitudinal probability sample survey of the UK population. *The Lancet Psychiatry*, *7*(10), 883–892. https://doi.org/10.1016/S2215-0366(20)30308-4

Planchuelo-Gómez, Á., Odriozola-González, P., Irurtia, M. J., & de Luis-García, R. (2020). Longitudinal evaluation of the psychological impact of the COVID-19 crisis in Spain. *Journal of Affective Disorders*, *277*, 842–849. https://doi.org/10.1016/J.JAD.2020.09.018

Pulido-Martos, M., Cortés-Denia, D., & Lopez-Zafra, E. (2021). Teleworking in Times of COVID-19: Effects on the Acquisition of Personal Resources. *Frontiers in Psychology*, *12*, 2485. https://doi.org/10.3389/FPSYG.2021.685275

Quoidbach, J., Berry, E. V., Hansenne, M., & Mikolajczak, M. (2010). Positive emotion regulation and well-being: Comparing the impact of eight savoring and dampening strategies. *Personality and Individual Differences*, *49*(5), 368–373. https://doi.org/10.1016/j.paid.2010.03.048

Romm, K. F., Park, Y. W., Hughes, J. L., & Gentzler, A. L. (2021). Risk and Protective Factors for Changes in Adolescent Psychosocial Adjustment During COVID-19. *Journal of Research on Adolescence*, *31*(3), 546–559. https://doi.org/10.1111/JORA.12667

Salari, N., Hosseinian-Far, A., Jalali, R., Vaisi-Raygani, A., Rasoulpoor, S., Mohammadi, M., … Khaledi-Paveh, B. (2020). Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. *Globalization and Health*, *16*(1), 1–11. https://doi.org/10.1186/S12992-020-00589-W/TABLES/2

Samios, C., Praskova, A., & Radlinska, B. (2021). The relationship between COVID-19 pandemic-related stress and meaning in life: testing the moderating effects of self-compassion and savoring. *Anxiety, Stress and Coping*. https://doi.org/10.1080/10615806.2021.1974408

Sharma, M. K., Anand, N., Singh, P., Vishwakarma, A., Mondal, I., Thakur, P. C., & Kohli, T. (2020). Researcher burnout: An overlooked aspect in mental health research in times of COVID-19. *Asian Journal of Psychiatry*, *54*, 102367. https://doi.org/10.1016/J.AJP.2020.102367

Smith, J. L., & Hanni, A. A. (2017). Effects of a Savoring Intervention on Resilience and Well-Being of Older Adults: *Https://Doi-Org.Gaelnomade-1.Grenet.Fr/10.1177/0733464817693375*, *38*(1), 137–152. https://doi.org/10.1177/0733464817693375

Springer, K. W., Pudrovska, T., & Hauser, R. M. (2011). Does psychological well-being change with age? Longitudinal tests of age variations and further exploration of the multidimensionality of Ryff's model of psychological well-being. *Social Science Research*, *40*(1), 392–398. https://doi.org/10.1016/J.SSRESEARCH.2010.05.008

Stone, A. A., Schwartz, J. E., Broderick, J. E., & Deaton, A. (2010). A snapshot of the age distribution of psychological well-being in the United States. *Proceedings of the National Academy of Sciences*, *107*(22), 9985–9990. https://doi.org/10.1073/PNAS.1003744107

Storrie, K., Ahern, K., & Tuckett, A. (2010). A systematic review: Students with mental health problems—A growing problem. *International Journal of Nursing Practice*, *16*(1), 1–6. https://doi.org/10.1111/J.1440-172X.2009.01813.X

Straszewski, T., & Siegel, J. T. (2018). Positive Emotion Infusions: Can Savoring Increase Help-Seeking Intentions among People with Depression? *Applied Psychology: Health and Well-Being*, *10*(1), 171–190. https://doi.org/10.1111/aphw.12122

Svendsen, J. L., Osnes, B., Binder, P. E., Dundas, I., Visted, E., Nordby, H., … Sørensen, L. (2016). Trait Self-Compassion Reflects Emotional Flexibility Through an Association with High Vagally Mediated Heart Rate Variability. *Mindfulness*, *7*(5), 1103–1113. https://doi.org/10.1007/s12671-016-0549-1

Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., … Stewart-Brown, S. (2007). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): development and UK validation. *Health and Quality of Life Outcomes 2007 5:1*, *5*(1), 1–13. https://doi.org/10.1186/1477-7525-5-63

Trougakos, J. P., Chawla, N., & McCarthy, J. M. (2020). Working in a pandemic: Exploring the impact of COVID-19 health anxiety on work, family, and health outcomes. *Journal of Applied Psychology*, *105*(11), 1234–1245. https://doi.org/10.1037/APL0000739

Vaughan, R. S., Edwards, E. J., & MacIntyre, T. E. (2020). Mental Health Measurement in a Post Covid-19 World: Psychometric Properties and Invariance of the DASS-21 in Athletes and Non-athletes. *Frontiers in Psychology*, *11*. https://doi.org/10.3389/fpsyg.2020.590559

Verger, P., Guagliardo, V., Gilbert, F., Rouillon, F., & Kovess-Masfety, V. (2010). Psychiatric disorders in students in six French universities: 12-month prevalence, comorbidity, impairment and help-seeking. *Social Psychiatry and Psychiatric Epidemiology*, *45*(2), 189–199. https://doi.org/10.1007/s00127-009-0055-z

Vigouroux, S. Le, Lebert-Charron, A., Wendland, J., Boujut, E., Scola, C., & Dorard, G. (2021). COVID-19 and Parental Burnout: Parents Locked Down but Not More Exhausted. https://doi.org/10.1177/0192513X211030038

Vindegaard, N., & Benros, M. E. (2020). COVID-19 pandemic and mental health consequences: Systematic review of the current evidence. *Brain, Behavior, and Immunity*, *89*, 531–542. https://doi.org/10.1016/J.BBI.2020.05.048

Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R. S., … Ho, C. (2020). A longitudinal study on the mental health of general population during the COVID-19 epidemic in China. *Brain, Behavior, and Immunity*, *87*, 40–48. https://doi.org/10.1016/J.BBI.2020.04.028

Waring, S. V., & Kelly, A. C. (2019). Trait self-compassion predicts different responses to failure depending on the interpersonal context. *Personality and Individual Differences*, *143*, 47–54. https://doi.org/10.1016/J.PAID.2019.01.043

Wilson, J. M., Weiss, A., & Shook, N. J. (2020). Mindfulness, self-compassion, and savoring: Factors that explain the relation between perceived social support and well-being. *Personality and Individual Differences*, *152*, 109568. https://doi.org/10.1016/J.PAID.2019.109568

Yamaguchi, K., Takebayashi, Y., Miyamae, M., Komazawa, A., Yokoyama, C., & Ito, M. (2020). Role of focusing on the positive side during COVID-19 outbreak: Mental health perspective from positive psychology. *Psychological Trauma: Theory, Research, Practice, and Policy*, *12*, S49–S50. https://doi.org/10.1037/TRA0000807

Yu, S.-C., Sheldon, K. M., Lan, W.-P., & Chen, J.-H. (2020). Using Social Network Sites to Boost Savoring: Positive Effects on Positive Emotions. *International Journal of*

Environmental Research and Public Health 2020, Vol. 17, Page 6407, *17*(17), 6407. https://doi.org/10.3390/IJERPH17176407

Zanon, C., Brenner, R. E., Baptista, M. N., Vogel, D. L., Rubin, M., Al-Darmaki, F. R., … Zlati, A. (2021). Examining the Dimensionality, Reliability, and Invariance of the Depression, Anxiety, and Stress Scale–21 (DASS-21) Across Eight Countries. *Assessment*, *28*(6), 1531–1544. https://doi.org/10.1177/1073191119887449

Tables

Table 1

Participants' sociodemographic characteristics

Baseline characteristics	N	%
Gender		
Female	93	69.4
Male	41	30.6
Personal living situation		
Alone	30	22.4
In couple	55	41
In a shared flat	21	15.7
With their family	28	20.9
Type of housing		
Apartment without terrace or balcony	31	23.1
Apartment with terrace or balcony	59	44
House without terrace or garden	2	1.5
House with terrace or garden	42	31.3
University		
University Grenoble Alpes	81	60.5
University of Toulouse	25	18.7
Other	28	20.8
Thesis year		
1st	40	29.9
2nd	42	31.3
3rd	31	23.1
4th or more	21	15.7
Thesis grant		
Yes	109	81.3
No	25	18.7
Field of research		
Economy	4	2.00
Law and political sciences	5	3.73
Sciences	41	30.60
Human and social sciences	49	36.57
Engineering sciences	23	17.16
Medical studies	2	1.49
Arts	6	4.48
Langues and literature	4	2.99

Note. Data were collected during the first lockdown in France

Table 2.

Pearson's correlations between the measures at baseline

	M(SD)	1	2	3	4	5	6	7	8
1. Age	27.8 (4.96)	-							
2. Depression	7.17 (4.42)	-.153	-						
3. Anxiety	3.69 (3.76)	.000	.608***	-					
4. Stress	7.25 (4.37)	.011	.634***	.721***	-				
5. Well-being	45.6 (7.59)	.231**	-.673***	-.314**	-.437***	-			
6. Engagement	27.4 (10.8)	.149	-.308***	-.023	-.044	.371***	-		
7. Self-compassion	33.9 (7.83	.131	-.461***	-.344**	-.381***	.517***	.078	-	
8. Savoring	125 (22.35)	.065	-.457***	-.330**	-.287***	.481***	.067	.528***	-

*Note. n = 134 ; ** p < .01, *** p < .001*

Table 3

Mental health and well-being outcomes during the three lockdowns in France

Outcomes	Lockdown 1 M(SD)	Lockdown 2 M(SD)	Lockdown 3 M(SD)	ANOVA
Depression	7.17 (4.42)[a]	7.59 (4.79)[a]	8.70 (5.15)[b]	$F(2, 256) = 10.7$, $p < .001$, $\eta^2_p = .07$
Anxiety	3.69 (3.76)[a]	4.02 (3.65)[a]	4.72 (4.24)[b]	$F(2, 256) = 8.07$, $p < .001$, $\eta^2_p = .05$
Stress	7.25 (4.37)[a]	7.78 (4.53)[b]	9.19 (4.92)[c]	$F(2, 256) = 17.9$, $p < .001$, $\eta^2_p = .12$
Engagement	27.4 (10.8)[a]	28.2 (10.6)[a]	23.6 (13)[b]	$F(2, 246) = 10.8$, $p < .001$, $\eta^2_p = .08$
Self-compassion	33.9 (7.83) [a]	34.3 (8.08)[ab]	33.2 (7.98)[ac]	$F(2, 250) = 2.88$ $p > .05$, $\eta^2_p = .02$
Savoring	125 (22.5)[a]	125 (22.8)[a]	121 (30.9)[b]	$F(2, 248) = 3.98$ $p < .05$, $\eta^2_p = .03$

Note: The a, b and c indices are based on two-by-two post-hoc comparisons. Different letters in the same line indicate significant statistical differences.
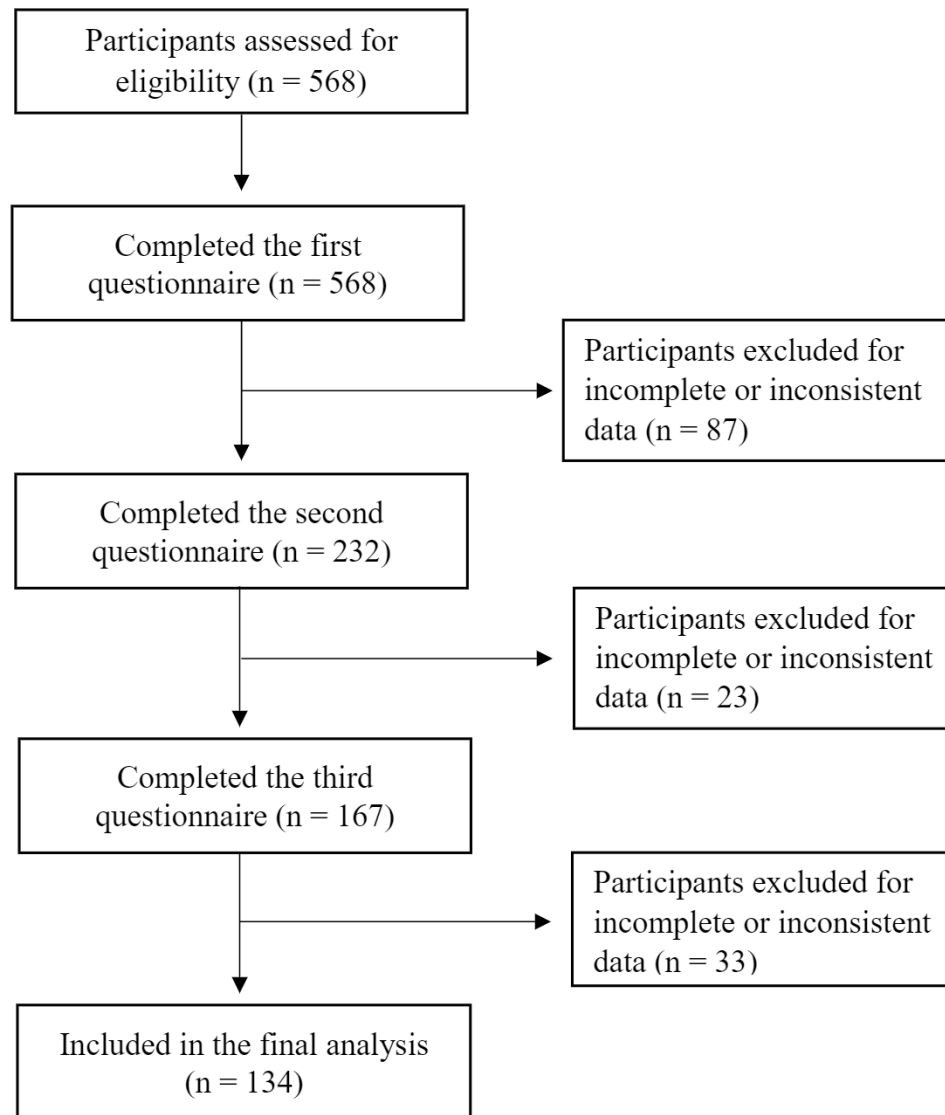
Figure

Figure 1

CONSORT flow chart of survey study participants