

**The Effects of Perceived Stress on Positive Affect Moderated by Acceptance: An
Experience Sampling Study**

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Abstract

Background. Experiencing lower momentary positive feelings poses a significant risk for developing mental illnesses such as anxiety, depression, or experiencing burnout. Momentary perceived stress, caused by daily hassles such as work commutes, has been related to lower positive affect. Adaptive coping strategies, of which acceptance is one, can aid in mitigating the negative mental health outcomes of PS caused by daily hassles. **Objective.** The aim of the current study is thus to utilize an ESM study design to investigate the association between PS and PA experienced concurrently and at a later time and the moderating effect of acceptance on PS and PA experienced at a later time. **Method.** The sample consisted of 56 participants aged between 18 and 53 years of age. They received three ESM-questionnaires on PS, PA and momentary acceptance 10 times per day at random moments 90 minutes apart over a one-week period. **Results.** The mixed linear regressions indicate a negative association between PS and PA experienced concurrently and no significant association between PS and later PA. No significant moderating effect of momentary acceptance over the past hour on the relationship between PS and later PA was found. There was a significant positive association between acceptance over the last hour and concurrent PA. **Conclusion.** Acceptance over the last hour positively correlating with PA is of practical significance as high PA aids in preventing negative mental health outcomes such as depression or burnout. Further research should aim to investigate the positive correlation between acceptance and PA. It should also utilise an experimental design to better determine causality and focus on differing emotional regulation strategies.

Keywords: Momentary perceived stress, positive affect, momentary acceptance, ESM-study design

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The Effects of Perceived Stress on Positive Affect Moderated by Acceptance: An Experience Sampling Study

A recent report by the American Psychological Association (APA, 2020) indicates that 65% of American adults experience increased stress levels. In other countries, a similarly high level of stress within the population can be measured. In Germany 44% of respondents experience stress. In the United Kingdom and Ireland, this number rises to 51% and 52%, respectively (Statista, 2022). Although experiencing a low amount of stress can be beneficial, the World Health Organization (WHO, 2021) informs that excessive stress can be overwhelming. Individuals experiencing a high level of stress often suffer from various symptoms of mental illness such as heightened levels of anxiety, depression (Hubbard & Reohr, 2018; Li & Lyu, 2021; Liu, Pu & Hou, 2016) or experience burnout (Dhabhar & McEwen, 1997; Dhabhar, 2018). Excessive stress not only results from major life events such as job loss or divorce, but also from daily hassles (Epel et al., 2018). Daily hassles are the requirements and circumstances of everyday life an individual may typically perceive as stressful or annoying such as commuting between home and workplace, disagreements with other individuals or malfunctioning equipment (Almeida, 2005; Asselmann et al., 2017). Studies found daily hassles to be more strongly associated with negative mental health outcomes than major life events (Asselmann et al., 2017; Junça-Silva & Lopes, 2023; Randall & Bodenmann, 2009). Furthermore, daily hassles have been shown to negatively influence and diminish positive emotions (Junça-Silva et al., 2020). In order to mitigate the negative effects of often unavoidable daily hassles and the resulting stress, it is important to gain a better understanding of the mental processes people use to manage their daily stress.

Daily Stress and the Experience Sampling Method (ESM)

Experiencing daily stress is a dynamic process during which each new stressful hassle immediately impacts and thus changes the person's affect (Almeida et al., 2009). Although hassles differ in frequency, content and severity, they share their instantaneous effect on

emotional functioning (Diehl et al., 2012). Considering these dynamics, daily stress can be considered as a fluctuating state influencing a person's affect (Almeida et al., 2009). Experience sampling methods (ESM) are well suited to assess fluctuating momentary states. Within an ESM study, participants fill out several questionnaires at different times during the day for up to two weeks (Myin-Germeys et al., 2018). They typically fill out items reporting on their momentary feelings and experiences (Myin-Germeys & Kuppens, 2021). In this manner, their momentary stress caused by a currently experienced hassle can be determined. Additionally, Lazarus and Folkman (1984) highlighted that people experience different levels of stress in response to similar stressors. This is largely explained by a person's relationship with their environment. In the so-called primary appraisal, a person considers whether the environment poses a harm/loss, threat, or challenge to their well-being. In a second step, the secondary appraisal, it is decided whether one's resources and ability to cope suffice to successfully master the given environment (Lazarus & Folkman, 1984). If a person appraises their resources as not sufficient to meet the demands of the given environment, they experience stress. ESM studies generally rely on self-reports and thus measure constructs by considering the participants' inner experiences (Myin-Germeys & Kuppens, 2021). They are therefore well suited to assess the participants' perceived momentary stress in response to daily hassles.

Perceived Momentary Stress and its Effects on Positive Affect

Affect is another construct well suited to be measured by ESM studies as it describes the emotional state experienced in the current moment (Pressman et al., 2019). Affect encompasses the two dimensions valence and arousal. Valence ranges on a subjective spectrum with pleasure on one end and displeasure on the other. Arousal represents the level of activation or energy experienced by the affect (Zhang et al., 2020). A pleasant valence is generally categorized as positive affect. When combined with high arousal, a person may experience momentary happiness, joy, or enthusiasm. Paired with low arousal one may

experience a positive affect of calmness or relaxation (Pressman et al., 2019). Past studies have indicated that perceived momentary stress impacts a person's affect by not only increasing negative affect but also decreasing concurrent positive affect (Almeida et al., 2009; Dokuz et al., 2022; Habets et al., 2021) as well as predicting future low positive affect (Chue et al., 2018; Leger et al., 2018). A lower positive affect entails that individuals experience less pleasure. However, it does not encompass experiencing more displeasure (Zhan et al., 2020). Thus, individuals indicating a low positive affect often feel apathic (Jögi, 2022). Prior studies investigating the effects of decreased positive affect have found it to be associated with lower mental health. There is an especially strong association between lower positive affect and depression (Dunkley et al., 2017; Höhn et al., 2013; Telford et al., 2011).

Acceptance Moderating the Effects of Momentary Perceived Stress on Positive Affect

The manner in which individuals cope with momentary perceived stress impacts their positive affect and general mental health (Diehl et al., 2012). Using effective coping skills when experiencing daily hassles can aid individuals in preventing depression or burnout (Dhabhar, 2018; Junça-Silva & Lopes, 2023). One possible method to cope with and mitigate the negative effects stress can have on one's mental health is to utilize emotional regulation strategies. Emotional regulation describes the up-and down-regulation of positive and negative emotions (McRae & Gross, 2020). Acceptance is a frequently employed adaptive emotional regulation technique (Naragon-Gainey, 2017). It encompasses a non-judgemental awareness during which individuals fully embrace the momentary experiences without judging them or getting too attached and emotionally involved with them (Bretherton, 2016; Lindsay et al., 2018). By utilizing acceptance, it is possible to approach emotions and thoughts with more openness and curiosity. This emotional regulation technique is centred around allowing internal and external experiences to occur, spread and fade without attempting to influence this process. According to Lindsay et al. (2018), individuals may notice a sense of openness and broadening of awareness. The positive effects of acceptance

enable individuals to delay immediately responding to stressful experiences. Thus, after determining whether there is a current threat, harm, loss, or challenge during the primary appraisal, using acceptance allows to better and more calmly assess resources and chose helpful coping strategies (Manocchi, 2017). Additionally, acceptance itself is a possible coping mechanism and resource that can be taken into consideration during secondary appraisal (Charbonnier & Graziani, 2016). Especially when the stressor is out of one's own control, acceptance is a helpful coping strategy. By using acceptance there is no attempt to change the stressor. Instead through acceptance the emotional reaction to the stressor is reduced (Mouzon, 2022). As there are a plethora of uncontrollable daily hassles such as the commute to work or malfunctioning equipment, using acceptance can be a helpful coping strategy. Previous studies demonstrate a positive effect of acceptance on the relationship between stress and mental illness (Jansen & Morris, 2017; Nassif et al., 2019; Vorkapi, 2017). However, the research on the effects of acceptance on the relationship between stress and positive affect is rather scarce. There are current studies investigating the moderating effect of acceptance on the relation between stress and positive affect, however, some studies included acceptance as part of a broader coping strategy such as mindfulness (Tschacher & Lienhard, 2021) or resilience (Ergün & Dewaele, 2021). Other studies assess the effectiveness of acceptance as coping mechanism not on momentary perceived stress but on chronic pain (Kranz et al., 2010; Zautra & Sturgeon, 2016). However, all previously mentioned studies suggest positive effects of the study variables on positive affect. It would thus be beneficial to investigate the effects of acceptance on momentary perceived stress and positive affect. These insights may further benefit the prevention of depression and burnout caused by daily hassles.

Present Study

The present study aims to examine the potential association of momentary acceptance with the effect of momentary stress on positive affect. Therefore, the study first assesses to what extent momentary stress is associated with positive affect within the current sample.

Thus, an ESM study was employed to answer the following research question: *To what extent does momentary acceptance weaken the effect of momentary stress on subsequent positive affect?* Three hypotheses were formulated in accordance with previous research:

Hypothesis 1a (H1a): Momentary stress is negatively associated with concurrent positive affect.

Hypothesis 1b (H1b): Momentary perceived stress is negatively associated with subsequent positive affect.

Hypothesis 2 (H2): The negative association between momentary perceived stress and subsequent positive affect is less strong when individuals use acceptance after experiencing momentary perceived stress.

Methods

Design

The study entailed a longitudinal research design using experience sampling methodology. Three questionnaires were employed to measure the constructs of momentary stress, momentary acceptance, and positive affect (see Appendix). Due to the study being part of a joint project including multiple researchers, various characteristics were measured. As they are not relevant to the current research question, they will not be mentioned in this paper. The study was approved by the BMS ethical committee of the University of Twente with request number 230038.

Participants

Participants were recruited through convenience sampling utilising the researchers' personal contacts. They were invited to the study via email and did not receive compensation. Furthermore, participants were required to download 'Ethica' to receive the questionnaires. They were asked to provide their informed consent and confirm they possessed sufficient command of the English language. There were no additional exclusion criteria for participation.

Procedure

After receiving an invitation email and signing the informed consent form, participants downloaded the application 'Ethica' to receive the questionnaires onto their phone. All participants received the first baseline questionnaire on the same day. This questionnaire encompassed several questions about demographic data (age, gender, nationality, occupation, highest obtained degree, including middle school, high school, bachelor, master, PhD or other). The baseline questionnaire was triggered once at the beginning. Participants received a notification as a reminder to complete the questionnaire after 8, 24 and 72 hours. Participants were able to complete the questionnaire after these reminders throughout the duration of the study as the questionnaire did not expire. Additionally, participants received the ESM-questionnaires. These questionnaires followed a semi-random design. They were triggered 10 times per day at random moments between 7.30 am and 10.30 pm in blocks of 90 minutes over a one-week period. Participants did not receive a notification as a reminder to complete the questionnaires. The questions expired after 15 minutes. Within the scope of this study participants completed questionnaires concerning their positive affect, perceived stress, and acceptance. The questionnaires were always sent in the same order.

Measures

Positive Affect

Participant's positive affect was investigated through a short questionnaire encompassing the items "How cheerful do you feel right now", "How enthusiastic do you feel right now?", "How satisfied do you feel right now?" and "How relaxed do you feel right now?". The items were measured on a seven-point Likert scale ranging from 1 (not at all) to 7 (very much). To test the internal consistency of the questionnaire Cronbach's alpha was calculated by creating person-mean centred scores for each item. The questionnaire demonstrated good internal consistency with a Cronbach's alpha of .87.

Momentary Perceived Stress

To assess the participant's perceived momentary stress, they were asked to fill out the item "How stressed do you feel right now?". They could indicate their momentary stress level on a seven-point Likert scale ranging from 1 (not at all) to 7 (very much). In absence of available items utilized in prior studies, no psychometric properties can be determined.

Momentary Acceptance

The participant's level of momentary acceptance was measured with the item "In the last hour, I could let go of my negative thoughts and feelings without acting upon them.". The item contained a seven-point Likert scale ranging from 1 (not at all) to 7 (very much). In absence of available items utilized in prior studies, no psychometric properties can be determined.

Data Analysis

The analysis was performed using SPSS (IBM, v. 29). Following the suggestion from Myin-Germeys and Kuppens (2021), participants with a response rate lower than 33.3% were excluded from the dataset.

Descriptive statistics for the demographics (frequency, per-cent respondents) and study variables (mean, standard deviation, minimum and maximum scores) were conducted. To answer the research question, all study variables were continuous and the assumptions for mixed linear regression and moderation of normality, equal variance of residuals and linearity, were tested. Additionally, multilevel modelling with an autoregressive structure was applied to control for nested data and autocorrelation (Armstrong et al., 2019). The internal validity of the positive affect scale was computed using Cronbach's alpha.

To test hypothesis 1a, a linear mixed model was applied utilizing perceived stress (PS) as the independent variable and positive affect (PA) as the dependent variable. The intercept and participant variable were included as random effects. The variable accounting for measurements at different time points was included as repeated effect. To test hypothesis 1b,

a lagged linear analysis was conducted using the independent variable PS and leading the dependent variable positive affect (PA_{T+1}). Thus, it was assessed whether concurrent perceived stress predicts positive affect at the next ‘beep’ 90 minutes later. Additionally, the study included intercept and participant variable as random effects. It was further controlled for PA by adding it as an independent covariate to account for a possible influence of concurrent positive affect on future positive affect (Fredrickson, 2004). The second hypothesis was tested by utilizing a moderation analysis, whereby PS was the independent variable and PA_{T+1} the dependent variable. The moderator was created by leading momentary acceptance (A_{T+1}), measuring it at the same time as PA_{T+1} , approximately 90 minutes after measuring PS. As this variable concerns the participants acceptance over the last hour retrospectively, it assesses how accepting the individual was between the time of measuring PS and PA_{T+1} . The intercept and participant variable were included as random effects. The moderation analysis controlled for momentary acceptance (A) as well as PA by adding them as independent covariates to account for possible influence of concurrent positive affect and momentary acceptance on future positive affect and momentary acceptance (Fredrickson, 2004). Lastly, the significance was tested employing a confidence interval of 95% ($\alpha = 0.05$).

Results

Descriptive Statistics

In total, the sample consisted of 111 participants. 55 participants were excluded as they filled out less than 1/3 of the questionnaires. After excluding participants with a low response rate, there were 18 missing responses for momentary perceived stress, 9 missing responses for positive affect and 56 missing responses for momentary acceptance. 27 participants did not complete the baseline questionnaire. Thus, the final sample encompassed the demographic data of 29 participants ranging between 18 and 53 years of age with a mean age of 23.38 ($SD = 6.52$). The average time-lag between responses was 2 hours with a standard deviation of 1 hour and 30 minutes. 19% of time-lags were larger than 5 hours.

Additional demographic characteristics are shown in Table 1. The 27 participants that did not complete the baseline questionnaire were not excluded as the demographic data is not needed to answer the hypotheses. The final sample, therefore, included a total of 56 participants.

Participants on average rated their positive affect with a 4.11 ($SD = 5.25$) on a 7-point Likert scale. Furthermore, on average they indicated their level of momentary acceptance with a 4.12 ($SD = 1.89$) and their level of momentary perceived stress with a 2.66 ($SD = 1.58$) (see Table 2).

Table 1*Demographic Characteristics (N = 29)*

Participant characteristics	Frequency (N)	Percentage
Gender		
Male	18	62.1
Female	10	34.5
Other	1	3.4
Nationality		
Dutch	10	34.5
German	17	58.6
Other	2	6.9
Occupation		
Student	6	20.7
Working	1	3.4
Self-employed	17	58.6
Studying and working	4	13.8
Not working	1	3.4
Degree		
Middle school	1	3.4
High school	26	89.7
Bachelor	1	3.4
PhD	1	3.4

Note. Occupation Other = No answer, Master = No answer

Table 2

Range, Mean and Standard Deviation and Total Number of Responses of the Study Variables

(N = 56)

Scale	<i>M</i>	<i>SD</i>	Range		Responses (N)
			<i>Min</i>	<i>Max</i>	
PA	4.11	5.25	1	7	2272
PS	2.66	1.58	1	7	2263
A	4.12	1.89	1	7	2225

Note. PA = Positive Affect, PS = Momentary Perceived Stress, A = Momentary Acceptance,

Responses (N) = total number of responses per item

Association between Momentary Perceived Stress and Positive Affect

To test hypothesis 1a, “*Momentary stress is negatively associated with concurrent positive affect.*”, a mixed linear regression was carried out after confirming that the assumptions of constant variance, normal distribution, and linearity were met. As displayed in Table 3, momentary perceived stress is significantly associated with positive affect ($B = -.49$, $SE = .02$, $p = <.001$). Thus, participants indicating an increase in momentary perceived stress of one point on the Likert-scale also experienced .49 less points in positive affect.

Table 3

Regression Analysis for Dependent Variable Positive Affect and Independent Variable Momentary Perceived Stress (N=56)

Effect	Estimate	SE	95% CI		p
			Lower	Upper	
Intercept	5.41	.1	5.21	5.61	<.001
PS	-.49	.02	-.52	-.46	<.001

Note. Model Significance: $F(1, 2256.53) = 937.48, p = <.001$

To test hypothesis 1b, “*Momentary perceived stress is negatively associated with subsequent momentary positive affect.*”, a lagged analysis using a mixed linear regression was carried out. As displayed in Table 4, there is no significant association between momentary perceived stress and later positive affect ($B = .01, SE = .02, p = .733$). Therefore, hypothesis 1b was rejected.

Table 4

Regression Analysis for the Lagged Dependent Variable Positive Affect, Independent Variable Perceived Stress and Covariate (N=56)

Effect	Estimate	SE	95% CI		p
			Lower	Upper	
Intercept	4.02	.19	3.65	4.39	<.001
PS	.01	.02	-.04	.06	.733
PA	.03	.03	-.03	.08	.314

Note. Model Significance: $F(1, 1843.48) = .12, p = .733$

Moderating Effect of Momentary Acceptance

An interaction effect as seen in Figure 2 was added to the mixed linear regression to investigate the research question “*The negative association between momentary perceived stress and subsequent positive affect is less strong when individuals use acceptance after experiencing momentary perceived stress.*”. The analysis seen in Table 5 shows that there is no significant moderation of momentary acceptance of the effect of momentary perceived stress on positive affect ($B = .01$, $SE = .01$, $p = .168$). Therefore, the second hypothesis was rejected.

Table 5

Moderation Analysis for the Lagged Dependent Variable Positive Affect, the Independent Variable Momentary Perceived Stress, the Lagged Momentary Acceptance, Interaction Effect and Covariates (N=56)

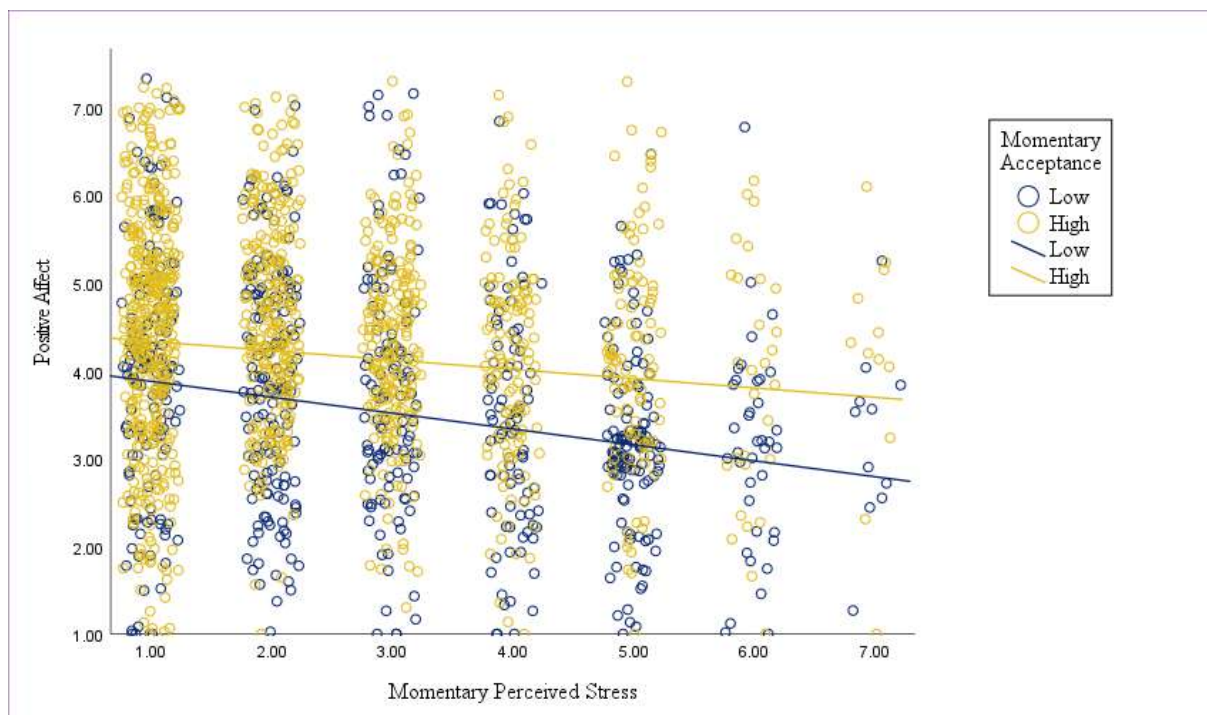
Effect	Estimate	SE	95% CI		p
			Lower	Upper	
Intercept	3.03	.21	2.6	3.45	<.001
PS	-.05	.05	-.14	.04	.308
PA	.12	.03	.07	.18	<.001
A	-.03	.02	-.06	.01	.120
A _{T+1}	.17	.03	.11	.22	<.001
PS* A _{T+1}	.01	.01	-.01	.03	.168

Note. A_{T+1} = Lagged Momentary Acceptance, PS* A_{T+1} = Interaction Effect, Model

Significance: $F(1, 1782.6) = 1.9$, $p = .168$

Figure 1

Jitter Plot of Momentary Perceived Stress and Lagged Positive Affect in Participants Varying in High and Low Acceptance



To better understand the results, a post hoc analysis was conducted testing whether momentary perceived stress predicts momentary acceptance approximately 90 minutes later (see Table 6). The mixed linear regression between the independent variable momentary perceived stress and the lagged dependent variable momentary acceptance controlling for concurrent momentary acceptance indicated no correlation and thus no predictive power ($B = .01, SE = .03, p = .942$).

Table 6

Regression Analysis for Lagged Dependent Variable Momentary Acceptance, Independent Variable Momentary Perceived Stress and Covariate (N= 56)

Effect	Estimate	SE	95% CI		p
			Lower	Upper	
Intercept	4.88	.2	3.48	4.28	<.001
A	.07	.02	.02	.12	.004
PS	.01	.03	-.06	.06	.942

Note. Model Significance: $F(1, 1610.08) = .01, p = .942$

Discussion

The present study aimed to investigate the effect of momentary perceived stress on positive affect and whether this effect is moderated by momentary acceptance. The findings represent a starting point for further investigation as only tentative causal inferences can be made based on the current study. The results indicate that individuals experiencing more stress simultaneously experience less positive affect. However, momentary perceived stress did not predict later positive affect. Within the current study no moderation between momentary perceived stress and later positive affect by momentary acceptance was found.

Momentary Perceived Stress and Positive Affect

In recent studies, perceived stress has been found to negatively impact positive affect (Bharani et al., 2022; Hepburn et al., 2021; Khan & Shamama-Tus-Sabah, 2020; Slimmen et al., 2022; Zamir et al., 2022). The current study corroborates this research by supporting the finding that perceived stress is negatively associated with positive affect. Furthermore, previous studies such as Chue et al. (2018) and Leger et al. (2018) have shown that stress may predict lower positive affect. Thus, it was expected that these findings would be reflected in the current study. However, no significant association between perceived stress and later

positive affect was found. A possible explanation for these findings may be stress recovery. Stress recovery describes the reinstatement of all affected variables, in this case of positive affect, to their pre-stress level (Velozo et al., 2022), thus returning to homeostasis (Vaessen et al., 2019). Velozo et al. (2022) assessed that a return to pre-stressor levels can take 15 minutes in lab studies to hours in daily life. Other studies have found that negative and positive affect influenced by daily stress returned to pre-stressor levels within approximately 90 minutes (Kuranova et al., 2020; Vaessen et al., 2019). Therefore, there may be an initial negative effect of momentary perceived stress on positive affect. However, at the next ‘beep’ full recovery to homeostasis may have taken place and the momentary perceived stress would have no effect on the lagged positive affect anymore.

Another possible explanation for the current findings may be deduced from the broaden and build theory and stress-buffering effects of positive affect. According to Fredrickson (2004) The broaden and build theory describes that experiencing positive emotions and affect encourages people act in an adaptive manner. Because of the adaptive behaviour people experience even more positive affect, thus creating an upward spiral (Fredrickson, 2004). Within the current sample concurrent positive affect was found to predict heightened positive affect at the next ‘beep’, supporting that positive affect may lead to more positive affect. Additionally, positive affect has been shown to have a buffering effect on perceived stress. According to Steenbergen et al. (2021) experiencing positive affect after a stressful event reduces self-reported stress a few minutes later. However, the beneficial and buffering effects of positive affect are not immediate but build up over time (Fredrickson, 2004). Thus, in the current sample there may still be an immediate negative effect of momentary perceived stress on positive affect, however over time this effect might be diminished.

The Moderation Effect of Momentary Acceptance

Previous studies show positive effects of concepts that include acceptance on the negative effects of stress on positive affect (Ergün & Dewaele, 2021; Tschacher & Lienhard, 2021). Thus, it was expected that acceptance would reduce the negative consequences of momentary perceived stress on positive affect. However, this was not supported by the current study. There are several possible explanations for this outcome. As mentioned previously, one possible explanation might be found within stress recovery. All variables may be reinstated to their pre-stressor levels after 90 minutes (Kuranova et al., 2020). Thus, there may be a moderation effect of momentary acceptance, yet, as all variables might have recovered to pre-stressor levels, no moderation of the negative effects of stress would be detected at the following ‘beep’, 90 minutes later. As shown in Table 6, there was no correlation between momentary perceived stress and momentary acceptance, indicating that participants used momentary acceptance regardless of experiencing high or low perceived momentary stress.

Another interpretation of the study results may explain the findings that momentary acceptance predicts momentary acceptance at the next ‘beep’. Momentary acceptance correlates with positive affect measured concurrently. As acceptance was assessed retrospectively, this indicates that using acceptance within the last hour correlated with heightened positive affect (see Table 5 & Figure 1). This may again be explained by the broaden and build theory (Fredrickson, 2004). High levels of acceptance lead to an increase in positive affect (Fan et al., 2023; Gunn et al., 2023) by encouraging curiosity and openness towards experiences and creating an open and non-judgemental attitude (Fan et al., 2023). This attitude may further facilitate acceptance and subsequent positive affect. Thus, individuals experiencing more positive affect might also utilize more acceptance and vice versa.

Another finding of the study indicates that there was no correlation between acceptance and positive affect after 90 minutes (see Table 5). This indicates that using

acceptance within the last hour is associated with heightened positive affect. However, the beneficial effect of acceptance does not impact positive affect after an additional 90 minutes. A possible explanation for this finding may be that within the last hour positive affect may not be fully recovered from momentary perceived stress. However, after an additional 90 minutes, homeostasis might be reinstated (Kuranova et al., 2020; Vaessen et al., 2019). According to the current results, once positive affect has fully recovered acceptance may not further improve it and no correlation would be found between acceptance and positive affect at the next 'beep'.

Strengths and Limitations

An important strength of the present study is that it adds to prior research concerning the effects of momentary perceived stress on positive affect by confirming the findings that higher momentary perceived stress is associated with concurrent lower positive affect. The study further indicates an association between momentary acceptance and higher positive affect, highlighting potential benefits of using acceptance. Additionally, the research on the effects of acceptance on the relationship between stress and positive affect is rather scarce. Thus, studies adding to this area of research are highly valuable. The insights may be beneficial in preventing negative mental health outcomes such as depression due to low positive affect. Lastly, participants in the current study were asked to indicate their inner experiences close to the time of their occurrence. This provides the advantage of minimising retrospective bias. (Masur, 2019; Myin-Germeys et al., 2018).

Aside from these strengths, there are several limitations that should be taken into consideration. Firstly, many participants were excluded. Of the original 111 participants 55 were excluded, lowering the statistical power of the study. Secondly, the questionnaire was rather long causing response fatigue (Ballegooijen et al., 2016). Additionally, many participants did not fill out the baseline questionnaire. Thus, the data about the demographics is limited and further exploration of the results may be hampered. Furthermore, momentary

acceptance and momentary perceived stress were measured with only one item.

Commonplace statistical measurements such as internal consistency cannot be calculated from a single-item measure (Allen et al., 2022). Therefore, the ability to ensure the quality of the item assessing momentary perceived stress and momentary acceptance is impeded. Lastly, due to the nature of the study, solely tentative causal inferences can be made concerning the study variables.

Future Research and Implications

For future studies, it would be interesting to further investigate the causation between the relationship of momentary perceived stress, positive affect, and momentary acceptance. A possible study design that could be utilised to investigate causality is the experimental study with a pretest-posttest design (Baldwin, 2018; Siedlecki, 2020). Furthermore, the current sample expressed an overall low level of momentary perceived stress. However, past studies have found that more than half of the population experience an elevated level of stress (APA, 2020; Statista, 2022). This indicates that the current sample might not have been representative of the general population concerning the level of momentary perceived stress. Future studies could thus select a sample with a higher or moderate level of momentary perceived stress. Additionally, the current study was not able to detect an association between momentary perceived stress and acceptance nor a moderation effect of momentary acceptance on the relationship between momentary perceived stress and positive affect. However, acceptance over the last hour was associated with heightened positive affect. Investigating how acceptance may be related to higher positive affect would not only have theoretical implications to further understand the concept of acceptance but also practical significance. It is important to aid individuals in retaining a high positive affect as this may prevent possible negative mental health outcomes such as depression (Dunkley et al., 2017; Höhn et al., 2013; Telford et al., 2011) Furthermore, there was a change in the relationship between momentary perceived stress and immediate positive affect to positive affect at a later time. Thus, an

emotional regulation process of perceived stress may have taken place. It would be of interest to investigate how this process took place considering acceptance does not appear to impact the relationship. Recovering well from perceived stress is a highly useful skill to avoid long-term effects such as burnout (Dhabhar & McEwen, 1997; Dhabhar, 2018). Investigating possible causes for this change in the relationship between perceived stress and positive affect would thus not only have theoretical but also practical implications as it may aid individuals in preventing burnout.

Conclusion

To conclude, the current study highlights the negative association of momentary perceived stress on immediate positive affect. It is further implied that momentary perceived stress is not correlated with later positive affect and that acceptance does not moderate these findings. The study added to the current body of research by verifying that stress negatively correlates with positive affect. It further highlighted the positive correlation between acceptance and positive affect. However, other findings are in contradiction with previous research as it was suggested that perceived stress would impact later positive affect and acceptance would moderate this association. Nevertheless, there are several limitations pertaining to the low response rate, quality of the items and study design. Thus, further studies should be conducted taking into consideration these drawbacks, further investigating the relationship between acceptance and positive affect, the causality between the study variables with a differing sample and moderator variable.

References

- Allen, M. G., Iliescu, D., & Greiff, S. (2022). Single Item Measures in Psychological Science. *European Journal of Psychological Assessment*, 38(1), 1–5.
<https://doi.org/10.1027/1015-5759/a000699>
- Almeida, D. M. (2005). Resilience and vulnerability to daily stressors assessed via diary methods. *Current Directions in Psychological Science*, 14(2), 64–68.
<https://doi.org/10.1111/j.0963-7214.2005.00336.x>
- Almeida, D. M., McGonagle, K. A., & King, H. A. (2009). Assessing daily stress processes in social surveys by combining stressor exposure and salivary cortisol.
<https://doi.org/10.1080/19485560903382338>
- American Psychological Association. (2020). Stress in America™ 2020: A national health crisis [Press release]. <https://www.apa.org/news/press/releases/stress/2020/report-october>
- Armstrong, B., Covington, L., Unick, G. J., & Black, M. M. (2018). Bidirectional effects of sleep and sedentary behavior among toddlers: A dynamic multilevel modeling approach. *Journal of Pediatric Psychology*, 44(3), 275–285.
<https://doi.org/10.1093/jpepsy/jsy089>
- Asselmann, E., Wittchen, H., Lieb, R., & Beesdo-Baum, K. (2017). A 10-year prospective-longitudinal study of daily hassles and incident psychopathology among adolescents and young adults: interactions with gender, perceived coping efficacy, and negative life events. *Social Psychiatry and Psychiatric Epidemiology*, 52(11), 1353–1362.
<https://doi.org/10.1007/s00127-017-1436-3>
- Baldwin, L. (2018). Research designs and their limitations. In *BRILL eBooks* (pp. 37–48).
https://doi.org/10.1163/9789004365155_008

- Bharani, R., Dhivyadharshini, G., Priyanga, A., Iswariya, K., & Joys, J. (2022). A study on perceived stress and mental Well-Being among medical college students. *Journal of Positive School Psychology*, 6(3), 5746–5752. <http://journalppw.com/>
- Bretherton, R. (2016). Itai Ivztan and Tim Lomas (eds.): Mindfulness in positive psychology: The science of meditation and wellbeing. Routledge, London, UK, 2016, 348 pp. *Mindfulness*. <https://doi.org/10.1007/s12671-016-0667-9>
- Charbonnier, E., & Graziani, P. (2016). The stress associated with the coming out process in the young adult population. *Journal of Gay & Lesbian Mental Health*, 20(4), 319–328. <https://doi.org/10.1080/19359705.2016.1182957>
- Chue, A., Gunthert, K. C., Kim, R. W., Alfano, C. A., & Ruggiero, A. (2018). The role of sleep in adolescents' daily stress recovery: Negative affect spillover and positive affect bounce-back effects ☆. *Journal of Adolescence*, 66(1), 101–111. <https://doi.org/10.1016/j.adolescence.2018.05.006>
- De Calheiros Velozo, J., Vaessen, T., Lafit, G., Claes, S., & Myin-Germeys, I. (2022). Is daily-life stress reactivity a measure of stress recovery? An investigation of laboratory and daily-life stress. *Stress and Health*. <https://doi.org/10.1002/smi.3213>
- Dhabhar, F. S. (2018). The short-term stress response – Mother nature's mechanism for enhancing protection and performance under conditions of threat, challenge, and opportunity. *Frontiers in Neuroendocrinology*, 49, 175–192. <https://doi.org/10.1016/j.yfrne.2018.03.004>
- Dhabhar, F. S., & McEwen, B. S. (1997). Acute stress enhances while chronic stress suppresses cell-mediated immunity in vivo: A potential role for leukocyte trafficking. *Brain Behavior and Immunity*, 11(4), 286–306. <https://doi.org/10.1006/brbi.1997.0508>
- Diehl, M., Hay, E. L., & Chui, H. C. (2012). Personal risk and resilience factors in the context of daily stress. *Annual Review of Gerontology and Geriatrics*, 32(1), 251–274. <https://doi.org/10.1891/0198-8794.32.251>

- Dokuz, G., Kani, A. S., Uysal, Ö., & Kuşçu, M. K. (2022). The impact of childhood trauma and daily life experiences on emotional and psychotic symptom intensity in psychosis: An experience sampling study. *Psychiatry Research-neuroimaging*, *317*, 114872. <https://doi.org/10.1016/j.psychres.2022.114872>
- Dunkley, D. M., Lewkowski, M., Lee, I. A., Preacher, K. J., Zuroff, D. C., Berg, J. E., Foley, J. E., Myhr, G., & Westreich, R. (2017). Daily stress, coping, and negative and positive affect in depression: complex trigger and maintenance patterns. *Behavior Therapy*, *48*(3), 349–365. <https://doi.org/10.1016/j.beth.2016.06.001>
- Epel, E. S., Crosswell, A. D., Mayer, S., Prather, A. A., Slavich, G. M., Puterman, E., & Mendes, W. B. (2018). More than a feeling: A unified view of stress measurement for population science. *Frontiers in Neuroendocrinology*, *49*, 146–169. <https://doi.org/10.1016/j.yfrne.2018.03.001>
- Ergün, A. L. P., & Dewaele, J. (2021). Do well-being and resilience predict the foreign language teaching enjoyment of teachers of italian? *System*, *99*, 102506. <https://doi.org/10.1016/j.system.2021.102506>
- Fan, S., Yu, S., & Xu, W. (2023). Longitudinal relationship between mindful awareness, acceptance and mental health problems: A mediation model. *Psychological Reports*, 003329412311666. <https://doi.org/10.1177/00332941231166615>
- Fredrickson, B. L. (2004). The broaden-and-build theory of positive emotions. *Philosophical Transactions of the Royal Society B*, *359*(1449), 1367–1377. <https://doi.org/10.1098/rstb.2004.1512>
- Gunn, K. M., Skaczkowski, G., Dollman, J., Vincent, A. D., Brumby, S., Short, C. E., & Turnbull, D. (2022). A self-help online intervention is associated with reduced distress and improved mental wellbeing in australian farmers: The evaluation and key mechanisms of www.ifarmwell.com.au. *Journal of Agromedicine*, 1–15. <https://doi.org/10.1080/1059924x.2022.2156642>

- Habets, P., Delespaul, P., & Jeandarme, I. (2021). The importance of context: An ESM study in forensic psychiatry. *International Journal of Offender Therapy and Comparative Criminology*, 66(1), 84-97. <https://doi.org/10.1177/0306624x20986530>
- Hepburn, S., Carroll, A., & McCuaig, L. (2021). The relationship between mindful attention awareness, perceived stress and subjective wellbeing. *International Journal of Environmental Research and Public Health*, 18(23), 12290. <https://doi.org/10.3390/ijerph182312290>
- Höhn, P., Menne-Lothmann, C., Peeters, F., Nicolson, N. A., Jacobs, N., Derom, C., Thiery, E., Van Os, J., & Wichers, M. (2013). Moment-to-moment transfer of positive emotions in daily life predicts future course of depression in both general population and patient samples. *PLOS ONE*, 8(9), e75655. <https://doi.org/10.1371/journal.pone.0075655>
- Hubbard, K., Reohr, P., Tolcher, L., & Downs, A. (2018). Stress, mental health symptoms, and help-seeking in college students. *Psi Chi Journal of Psychological Research*, 23(4), 293–305. <https://doi.org/10.24839/2325-7342.jn23.4.293>
- Jansen, J. E., & Morris, E. A. (2017). Acceptance and commitment therapy for posttraumatic stress disorder in early psychosis: A case series. *Cognitive and Behavioral Practice*, 24(2), 187–199. <https://doi.org/10.1016/j.cbpra.2016.04.003>
- Jõgi, A., Aulén, A., Pakarinen, E., & Lerkkanen, M. (2022). Teachers' daily physiological stress and positive affect in relation to their general occupational well-being. *British Journal of Educational Psychology*, 93(1), 368–385. <https://doi.org/10.1111/bjep.12561>
- Junça-Silva, A., Caetano, A., & Lopes, R. R. (2020). A workingday in the life of employees: Development and validation of the scale for daily hassles and uplifts at work. *TPM-Testing, Psychometrics, Methodology in Applied Psychology*, 27(2), 221–250. <https://doi.org/10.4473/TPM27.2.5>

- Junça-Silva, A., & Lopes, R. R. (2020). Unfriendly customer behaviors and employees' psychological capital: the role of health symptoms and positive humor events. *Current Psychology, 42*(19), 16381–16391. <https://doi.org/10.1007/s12144-020-01163-8>
- Khan, S., & Shamama-Tus-Sabah, S. (2020). Perceived stress and its association with positive mental health and academic performance of university students. *Pakistan Armed Forces Medical Journal, 70*(5), 1391–1395.
<https://pafmj.org/index.php/PAFMJ/article/view/5571>
- Kranz, D., Bollinger, A., & Nilges, P. (2010). Chronic pain acceptance and affective well-being: A coping perspective. *European Journal of Pain, 14*(10), 1021–1025.
<https://doi.org/10.1016/j.ejpain.2010.03.010>
- Kuranova, A., Booij, S. H., Menne-Lothmann, C., Decoster, J., Van Winkel, R., Delespaul, P., De Hert, M., Derom, C., Thiery, E., Rutten, B. P. F., Jacobs, N., Van Os, J., Wigman, J. T. W., & Wichers, M. (2020). Measuring resilience prospectively as the speed of affect recovery in daily life: a complex systems perspective on mental health. *BMC Medicine, 18*(1). <https://doi.org/10.1186/s12916-020-1500-9>
- Lazarus, R. S., PhD, & Folkman, S., PhD. (1984). *Stress, appraisal, and coping*. Springer Publishing Company.
- Leger, K. A., Charles, S. T., & Almeida, D. M. (2018). Let it go: Lingering negative affect in response to daily stressors is associated with physical health years later. *Psychological Science, 29*(8), 1283–1290. <https://doi.org/10.1177/0956797618763097>
- Li, X., & Lyu, H. (2021). Epidemic risk perception, perceived stress, and mental health during COVID-19 pandemic: A moderated mediating model. *Frontiers in Psychology, 11*.
<https://doi.org/10.3389/fpsyg.2020.563741>
- Lindsay, E. K., Young, S., Smyth, J. M., Brown, K. W., & Creswell, J. D. (2018). Acceptance lowers stress reactivity: Dismantling mindfulness training in a randomized controlled

- trial. *Psychoneuroendocrinology*, 87, 63–73.
<https://doi.org/10.1016/j.psyneuen.2017.09.015>
- Liu, B., Pu, J., & Hou, H. (2016). Effect of perceived stress on depression of Chinese “Ant Tribe” and the moderating role of dispositional optimism. *Journal of Health Psychology*, 21(11), 2725–2731. <https://doi.org/10.1177/1359105315583373>
- Manocchi, P. E. (2017). Fostering academic success in nursing students through mindfulness: A literature review. *Teaching and Learning in Nursing*, 12(4), 298–303.
<https://doi.org/10.1016/j.teln.2017.05.002>
- Masur, P. K. (2019). Capturing situational dynamics: Strength and pitfalls of the experience sampling method. <https://doi.org/10.31219/osf.io/vx5ha>
- McRae, K., & Gross, J. J. (2020). Emotion regulation. *Emotion*, 20(1), 1–9.
<https://doi.org/10.1037/emo0000703>
- Mouzon, D. M. (2022). Chronic stress, coping, and mental health among older African Americans. *Journal of Aging and Health*, 34(3), 347–362.
<https://doi.org/10.1177/08982643221085805>
- Myin-Germeys, I., Kasanova, Z., Vaessen, T., Vachon, H., Kirtley, O. J., Viechtbauer, W., & Reininghaus, U. (2018). Experience sampling methodology in mental health research: New insights and technical developments. *World Psychiatry*, 17(2), 123–132.
<https://doi.org/10.1002/wps.20513>
- Myin-Germeys, I., & Kuppens, P. (2021). Experience sampling methods, an introduction. In *The Open Handbook of Experience Sampling Methodology: A Step-by-step Guide to Designing, Conducting, and Analyzing ESM Studies* (pp. 7-19). The center for Research on Experience sampling and Ambulatory methods Leuven.
- Naragon-Gainey, K., McMahon, T. P., & Chacko, T. (2017). The structure of common emotion regulation strategies: A meta-analytic examination. *Psychological Bulletin*, 143(4), 384–427. <https://doi.org/10.1037/bul0000093>

- Nassif, T. H., Start, A. R., Toblin, R. L., & Adler, A. B. (2019). Self-reported mindfulness and soldier health following a combat deployment. *Psychological Trauma: Theory, Research, Practice, and Policy*, *11*(4), 466–474. <https://doi.org/10.1037/tra0000413>
- Pressman, S. D., Jenkins, B. N., & Moskowitz, J. T. (2019). Positive affect and health: What do we know and where next should we go? *Annual Review of Psychology*, *70*(1), 627–650. <https://doi.org/10.1146/annurev-psych-010418-102955>
- Randall, A. K., & Bodenmann, G. (2009). The role of stress on close relationships and marital satisfaction. *Clinical Psychology Review*, *29*(2), 105–115. <https://doi.org/10.1016/j.cpr.2008.10.004>
- Siedlecki, S. L. (2020). Quasi-experimental research designs. *Clinical Nurse Specialist*, *34*(5), 198–202. <https://doi.org/10.1097/nur.0000000000000540>
- Slimmen, S., Timmermans, O., Mikolajczak-Degrauwe, K., & Oenema, A. (2022). How stress-related factors affect mental wellbeing of university students A cross-sectional study to explore the associations between stressors, perceived stress, and mental wellbeing. *PLOS ONE*, *17*(11), e0275925. <https://doi.org/10.1371/journal.pone.0275925>
- Statista. (2022, October 20). *Prevalence of anxiety, depression, and stress in Europe in 2022*. <https://www.statista.com>.
- World Health Organization. (2022, June). *Stress*. <https://www.who.int>
- Telford, C., McCarthy-Jones, S., Corcoran, R., & Rowse, G. (2011). Experience sampling methodology studies of depression: the state of the art. *Psychological Medicine*, *42*(6), 1119–1129. <https://doi.org/10.1017/s0033291711002200>
- Tschacher, W., & Lienhard, N. (2021). Mindfulness is linked with affectivity in daily life: An experience-sampling study with meditators. *Mindfulness*, *12*(6), 1459–1472. <https://doi.org/10.1007/s12671-021-01615-7>

- Vaessen, T., Viechtbauer, W., Van Der Steen, Y., Gayer-Anderson, C., Kempton, M. J., Valmaggia, L., McGuire, P., Murray, R. M., Garety, P., Wykes, T., Morgan, C., Lataster, T., Lataster, J., Collip, D., Hernaus, D., Kasanova, Z., Delespaul, P., Oorschot, M., Claes, S., . . . Myin-Germeys, I. (2019). Recovery from daily-life stressors in early and chronic psychosis. *Schizophrenia Research, 213*, 32–39. <https://doi.org/10.1016/j.schres.2019.03.011>
- Van Steenbergen, H., De Bruijn, E. R., Van Duijvenvoorde, A. C. K., & Van Harmelen, A. (2021). How positive affect buffers stress responses. *Current Opinion in Behavioral Sciences, 39*, 153–160. <https://doi.org/10.1016/j.cobeha.2021.03.014>
- Vorkapić, S. T., & Pelozza, I. (2017). Exploring personality traits and well-being among pre-school and primary school teachers in croatia. *Current Issues in Personality Psychology, 1*, 21–31. <https://doi.org/10.5114/cipp.2017.65830>
- Wang, X., Zhang, D., & Wang, J. (2011). Dual-factor model of mental health: Surpass the traditional mental health model. *Psychology, 02*(08), 767–772. <https://doi.org/10.4236/psych.2011.28117>
- Zamir, S., Afzal, S., & Shaheen, S. (2022). Social media engagement, perceived stress and mental wellbeing of prospective teachers: A mediation analysis. *Journal of Positive School Psychology, 6*(11), 1505–1518. <https://doi.org/10.1007/s10567-008-0030-3>
- Zautra, A., & Sturgeon, J. A. (2016). Examining the complexities of affective experience will enhance our understanding of pain and inform new interventions designed to bolster resilience. *Pain, 157*(8), 1586–1587. <https://doi.org/10.1097/j.pain.0000000000000614>
- Zhang, Y., Cole, D. A., Mick, C. R., Lovette, A. J., & Gabruk, M. E. (2020). Cognitive reactivity to low positive and high negative affect. *Behaviour Research and Therapy, 132*, 103683. <https://doi.org/10.1016/j.brat.2020.103683>

Appendix

Complete Baseline and ESM Questionnaire

Baseline questionnaire

Triggered once in the beginning, reminder after 8, 24 and 72 hours, does not expire

Demographics

- Age: How old are you?
- Gender: What gender do you identify as? Male, female, other
- Nationality: What is your nationality? Dutch German Other
- Occupation: What is your current occupation? Student, Working, Self-employed, studying and working, not working, other
- Highest degree obtained: Middle school (such as MBO, MTS, MEAO or Haupt- oder Realschule), High school (such as HAVO, VWO, HBS or Gymnasium/ Berufsschule/ Berufskolleg), High school, Bachelor, Master, PhD, Other

Mental well-being (MHC-SF)

During the past month, how often did you feel...

1. Happy
2. Interested in life
3. Satisfied with life
4. That you had something important to contribute to society
5. That you belonged to a community
6. That our society is a good place or is becoming a better place, for all people
7. That people are basically good
8. That the way our society works makes sense to you

9. That you liked most parts of your personality
10. Good at managing the responsibilities of your daily life
11. That you had warm and trusting relationships with others
12. That you had experiences that challenged you to grow and become a better person
13. Confident to think or express your own ideas and opinions
14. That your life has a sense of direction or meaning to it
 - a. Never
 - b. Once or twice
 - c. About once a week
 - d. About 2 or 3 times a week
 - e. Almost every day
 - f. Every day

Anxiety (GAD-7)

Over the last two weeks, how often have you been bothered by the following problems?

1. Feeling nervous, anxious, or on edge
2. Not being able to stop or control worrying
3. Worrying too much about different things
4. Trouble relaxing
5. Being so restless that it is hard to sit still
6. Becoming easily annoyed or irritable
7. Feeling afraid, as if something awful might happen
 - a. Not at all
 - b. Several days
 - c. More than half the days

- d. Nearly every day

Depression (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems?

1. Little interest or pleasure in doing things
2. Feeling down, depressed, or hopeless
3. Trouble falling or staying asleep, or sleeping too much
4. Feeling tired or having little energy
5. Poor appetite or overeating
6. Feeling bad about yourself or that you are a failure or have let yourself or your family down
7. Trouble concentrating on things, such as reading the newspaper or watching television
8. Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety or restless that you have been moving around a lot more

than usual

9. Thoughts that you would be better off dead, or of hurting yourself
 - a. Not at all
 - b. Several days
 - c. More than half the days
 - d. Nearly every day

Resilience (BRS)

Please respond to each item by marking one box per row

1. I tend to bounce back quickly after hard times

2. I have a hard time making it through stressful events.
3. It does not take me long to recover from a stressful event.
4. It is hard for me to snap back when something bad happens.
5. I usually come through difficult times with little trouble.
6. I tend to take a long time to get over set-backs in my life

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

Perceived Stress (PSS)

The questions in this scale ask you about your feelings and thoughts during THE LAST MONTH. In each case, please indicate your response by placing an “X” over the circle representing HOW OFTEN you felt or thought a certain way.

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and “stressed”?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?

6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that were outside your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

Never

Almost never

Sometimes

Fairly often

Very often

Cognitive reappraisal (ERQ subscale)

1. When I want to feel more positive emotion (such as joy or amusement), I change what I'm thinking about
2. When I want to feel less negative emotion (such as sadness or anger), I change what I'm thinking about.
3. When I'm faced with a stressful situation, I make myself think about it in a way that helps me stay calm
4. When I want to feel more positive emotion, I change the way I'm thinking about the situation
5. I control my emotions by changing the way I think about the situation I'm in

6. When I want to feel less negative emotion, I change the way I'm thinking about the situation.

1 Strongly disagree

2

3

4 Neutral

5

6

7 strongly agree

Rumination (CERQ subscale)

1. I often think about how I feel about what I have experienced.

2. I am preoccupied with what I think and feel about what I have experienced.

3. I want to understand why I feel the way I do about what I have experienced

4. I dwell upon the feelings the situation has evoked in me.

Almost never

Rarely

Occasionally

Frequently

Almost always

Acceptance (CERQ subscale)

1. I think that I have to accept that this has happened.
2. I think that I have to accept the situation.
3. I think that I cannot change anything about it.
4. I think I must learn to live with it.

Almost never

Rarely

Occasionally

Frequently

Almost always

ESM questionnaire

Triggered ten times a day at random moments between 07.30 until 22.30 in blocks of 90 minutes for a period of one week, no reminder, expires after 15 minutes

Positive and negative affect

Below you can find several questions about your current feelings. Please try to indicate how you felt right before you started to answer the questionnaire!

- How *cheerful* do you feel right now?
- How *enthusiastic* do you feel right now?
- How *satisfied* do you feel right now?
- How *relaxed* do you feel right now?
- How *anxious* do you feel right now?
- How *irritable* do you feel right now?
- How *down* do you feel right now?

- How *guilty* do you feel right now?
 - 1 (not at all) to 7 (very much)

Perceived stress

- How stressed do you feel right now?
 - 1 (not at all) to 7 (very much)

Stressful event + coping

Think of the most striking event or activity in last hour. How (un)pleasant was this event or activity?

- -3 (very unpleasant) to +3 (very pleasant)

How did you deal with this event?

- I kept thinking about it (rumination/savoring)
- I tried to distract my attention from it (distraction)
- I expressed my emotions (emotion expression)
- I talked to others about it (social support seeking)
- I tried to look at it in a different way (positive/negative reappraisal)
 - Yes/no

Think of the most striking event or activity in the last hour. How stressful was this event or activity?

- 1 (not at all) to 7 (very much)

Social context

Who are you with right now?

- Family member, friend, romantic partner, co-worker/fellow-student, unknown people/others, I am alone
- **If not alone:**
 - **I like this company**
 - 1 (not at all) to 7 (very much)
 - **I would rather be alone**
 - 1 (not at all) to 7 (very much)

Cognitive reappraisal

In the last hour, I tried to look at my problems from a different perspective

- 1 (not at all) to 7 (very much)

Rumination

In the last hour, I have been thinking about my problems

- 1 (not at all) to 7 (very much)

Acceptance

In the last hour, I could let go of my negative thoughts and feelings without acting upon them

- 1 (not at all) to 7 (very much)