Investigating the influence of psychological flexibility on the relationship between personality and well-being within University Students in the post-pandemic context

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Abstract

Objective: The importance of personality for well-being has already been established by previous research. Further, psychological flexibility is seen as an influential factor for this relationship by past research, as it comprises of the ability to adjust flexibly to situations which can enhance well-being. Not much research, has been conducted on these three constructs in the post-pandemic context within university students. In order to understand the differences in well-being levels between students, the present study investigated in what ways psychological flexibility served as a mediator for the relationship between personality and well-being.

Method: A cross-sectional study design was chosen. One-time administered survey data from a student population were collected and analysed (N=113), of which most were either German or Dutch with ages ranging from 19 to 30. Personality, with the focus on neuroticism and extraversion, psychological flexibility and well-being were measured through questionnaires in an online survey.

Results: A mediation analysis showed partial mediation of psychological flexibility on the relationship between neuroticism and well-being and between extraversion and well-being.

Conclusions: As psychological flexibility cannot explain the relationship between personality and well-being fully, a theoretical implication is to investigate further influential factors for this relationship that could be added to the model, in order to arrive at a more conclusive understanding of well-being. Nevertheless, a practical implication is that psychological flexibility is important for well-being in the post-pandemic context due to its protective properties. Hence, strengthening this ability in interventions is recommended in order to be better prepared for future crises.

Keywords: psychological flexibility, well-being, personality, post-Covid-19, university students, mediation analysis

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The question of what makes some people more resilient than others and why some people are more likely to experience a decline in mental well-being has been widely researched in the past. Particularly in light of the Covid-19 pandemic, which has heavily impacted many people's lives over the last two years, resilience is seen as an important factor in protecting against negative impacts on well-being (McCracken et al., 2021). Especially, psychological flexibility as part of resilience has been seen as having a great influence on well-being when faced with a big life stressor such as the Covid-19 pandemic (Dawson & Golijani-Moghaddam, 2020; McCracken et al., 2021). Given the fact that personality traits are closely connected to psychological flexibility (Gloster et al., 2011), it is essential to investigate the role of personality in individual differences in psychological flexibility and the resulting effects on well-being. Not much research has yet been conducted on this model with university students as the target group after the Covid-19 restrictions were lifted. Their lives have also changed drastically due to many constraints, such as the working from home policy and restrictions on social life (Holzer et al., 2021). Therefore, the aim of this research is to investigate in what ways personality and psychological flexibility affect well-being in university students after having navigated through the challenging Covid-19 pandemic.

Covid-19 pandemic and well-being

The unexpected and rapid outbreak of the Covid-19 virus in early 2020 imposed a big challenge for people all over the world. Strict government restrictions were announced trying to contain the spread of the virus in form of lockdowns, restrictions on social gatherings, and working and studying from home measures to only name a few. This sudden and big change in people's lives influenced the mental health and well-being of citizens all over the world to a great extent (O'Connor et al., 2021). Reports have been made on a decrease of well-being and increased mental health issues such as anxiety, depression and insomnia for many people (McCracken et al., 2021). In order to understand how such mental health issues develop, it is important to examine the concept of well-being.

Positive well-being is closely linked to mental health as it refers to a state of mind and living in which the individual is capable of dealing well with life stressors, can fulfil their own potential and is considered to go through life in a content and productive way (Westerhof & Keyes, 2010). More specifically, a high degree of mental well-being is described as the state of

optimal functioning through high levels of emotional, psychological and social well-being. High levels on all three dimensions mean that a person is flourishing in life. When a person shows low levels on all three dimensions, the individual is considered to be languishing which is related to lower mental health. (Westerhof & Keyes, 2010). Consequently, it is vital to protect the well-being of a person from adverse effects such as the recent Covid-19 pandemic and to strengthen skills that can aid in raising well-being levels during the recovery from such adverse effects. According to McCracken et al. (2021), in order to prevent negative effects on well-being from recurring in the future, it is important to investigate factors that can serve as a safeguard against such effects on well-being.

Psychological flexibility and well-being

A possible safeguard against negative effects on well-being is a person's level of psychological flexibility. The concept of psychological flexibility describes the skill of being able to respond flexibly to challenging situations and can be seen as part of mental resilience (Dawson & Golijani-Moghaddam, 2020). The latter refers to a way of effectively adapting to a challenging situation (Wu et al., 2013). For psychological flexibility, the fundamental aspect is the ability of a person to choose the way they want to respond to the situation by the choice of helpful coping strategies that can aid in achieving higher-level and long-term meaningful goals (Dawson & Golijani-Moghaddam, 2020). This can be beneficial for the individual as it reduces the risk of experiencing unpleasant mental health outcomes (Dawson & Golijani-Moghaddam, 2020). The term psychological flexibility originates from Acceptance and Commitment Therapy (ACT; Hayes et al., 1999). According to Bryan et al. (2015), an important characteristic of psychological flexibility is the resistance to avoidance coping styles. Such coping mechanisms offer individuals the opportunity to escape a stressful life event by avoiding to face or deal with it, for example through the use of distraction (Tindle et al., 2022). However, according to Tindle et al. (2022) such coping styles are connected to lower well-being. Nevertheless, it has been found that a high degree of psychological flexibility can decrease the use of avoidant coping mechanisms within an individual (Tindle et al., 2022). In addition, a higher degree of psychological flexibility has been associated with the use of approach coping styles, which are more solution-oriented coping styles that offer the possibility of dealing constructively with the stressful situation by accepting it as an example (Tindle et al., 2022). Hence, an individual high in psychological flexibility chooses to face emotional distress and is not easily brought off track in the accomplishment of meaningful goals. Consequently, psychological flexibility has been proven to be a protective factor against mental health problems and a decline in well-being

(Bryan et al., 2015). In light of recent events, multiple studies have already established the importance of psychological flexibility for mental health when faced with big challenges such as those imposed by the Covid-19 pandemic (Dawson & Golijani-Moghaddam, 2020; McCracken et al., 2021). This highlights the usefulness of examining these constructs in the context of the Covid-19 pandemic and recovery from it.

Personality and well-being

When having a closer look at the vital concept of psychological flexibility in past research, one can see that the concept is closely linked to personality (Steenhaut et al., 2020). More specifically, previous studies have found that psychological flexibility is associated with personality traits (Steenhaut et al., 2019; Steenhaut et al., 2020), which can lead to the assumption that a persons' level of psychological flexibility is unique and related to the nature of the individual personality. In order to understand how a persons' level of psychological flexibility is constituted and can be raised effectively in order to improve well-being levels, it seems plausible to look at the individual personality traits. The personality model that has often been used in recent studies on this matter is the Big Five with the traits neuroticism, extraversion, openness, agreeableness and conscientiousness (Osimo et al., 2021). The traits extraversion and neuroticism have mostly been related to effects on well-being (Steenhaut et al., 2020). Extraversion describes a proneness to positive emotional experiences meaning that individuals high in extraversion are more positively influenced by positive experiences than people who are less extraverted (Soto, 2015). On the contrary, neuroticism is a trait with an inclination to negative emotional experiences which means that an individual reacts more strongly to negative incidents (Soto, 2015). When setting these traits in relation to well-being, it has been found that extraversion is positively related to well-being, while neuroticism influences well-being in a negative way (Kocjan et al., 2021). A proneness towards positive or negative emotions consequently impacts how a person's well-being is constituted.

Personality and psychological flexibility

Not just the relation between personality traits and well-being is of importance to examine, also the relation between traits and psychological flexibility is of great value due to the traits' predictive nature. According to Latzman and Masuda (2013), a positive relation was found between neuroticism and psychological inflexibility, which can be explained by the fact that both are related to the experience of negative emotions by the individual. Moreover, a negative relation between psychological inflexibility and extraversion has been found (Latzman

& Madusa, 2013). As especially the trait neuroticism has been linked to psychopathology in past research (Latzman & Madusa, 2013), it is vital to investigate the three variables personality, psychological flexibility and well-being and their relationship to each other.

This is what Steenhaut et al. (2019) and Steenhaut et al. (2020) undertook in two of their studies, in which they established that psychological flexibility can mediate the relationship of personality to subjective well-being. It was found that the personality trait extraversion had a positive effect on well-being through psychological flexibility and the personality trait neuroticism had a negative effect on well-being which ran partially through psychological flexibility (Steenhaut et al., 2020). Thereby the effect of the different personality traits, mainly extraversion and neuroticism on well-being were proven and were seen as partially explained by the cognitive skill of psychological flexibility. Given the fact that this model can explain the importance of personality and psychological flexibility with regard to subjective well-being, it would be of great interest to investigate this relationship in the post-Covid-19 context. Not much research has yet been conducted on the connection between these constructs in times in which people recover from the effects of the pandemic.

University students in the Covid-19 pandemic

Another gap that has been identified is the examination of the variables personality, psychological flexibility and well-being in the post-pandemic context within younger people such as university students. As the pandemic drastically changed their realities from on-campus classes to entirely virtual work from home, many students experienced a decline in overall quality of life which led to a decrease in well-being and mental health for many students (Holzer et al., 2021). Being isolated at home, and not being able to meet fellow students and interact in the usual way was associated with increased loneliness and a decline in well-being (Kohls et al., 2021). Furthermore, several studies have shown that symptoms of depression and anxiety increased within students as a consequence of the Covid-19 pandemic and its drastic changes to academic as well as personal and social life (Kohls et al., 2021). According to Kohls et al (2021), what is striking is that half of the participants in their study who had been diagnosed with a mental health condition before had not undergone therapy, which underlines the need for psychological support in crises such as the recent Covid-19 pandemic. When looking at the vast number of reports of decreased well-being in university students, the question arises which protective measures could prevent low levels of well-being. Further, another question emerges on why not every student's mental well-being decreased notably as all were affected by the

pandemic. This could indicate that a difference in resilience and more specifically psychological flexibility could have played an important role.

The present study

A connection between personality, psychological flexibility and well-being has already been established (Steenhaut et al., 2020). Therefore, investigating these variables amongst university students who had to navigate through the challenging time of the pandemic could provide a deeper understanding of how personality and psychological flexibility can explain well-being levels in times of recovery from adverse effects. The research question and focus of this study therefore is "In what ways does psychological flexibility serve as a mediator in the relationship between personality and well-being in the post-Covid 19 context within university students?" The aim is to find out how psychological flexibility is influenced by personality and in what ways this influences well-being in the face of the Covid-19 pandemic. Consequently, the hypotheses are:

H1: After the pandemic, student's neuroticism negatively relates with their well-being levels through being negatively associated with their psychological flexibility.

H2: After the pandemic, student's extraversion positively relates with their well-being levels through being positively associated with their psychological flexibility.

Investigating this could provide useful insights on the role of both personality and psychological flexibility in the context of the recovery from a big life stressor such as the Covid-19 pandemic. Especially, psychological flexibility is of interest as it is a skill that can be trained (Steenhaut et al., 2019), and can therefore be a valuable tool for navigating through future crises.

Methods

Design

The study design is a cross-sectional design with one-time administered survey data. In this study personality was the predictor variable, psychological flexibility the mediator variable and well-being the outcome variable. To examine these variables a quantitative online survey was conducted.

Participants

A sample of 156 participants took part in the study which was carried out in April 2022. The participants consisted of university students living in Germany and the Netherlands and who were of legal age. Many of these participants were recruited through SONA, a website of the University of Twente that offers researchers to publish their studies and find participants who are offered credits for their participation. Apart from the SONA system, participants were also found through publishing information and the participation link to the study on social media platforms (WhatsApp, Instagram). Criteria for participation were to be of legal age and to speak English fluently. Fortunately, all participants met the inclusion criteria. However, if participants did not complete the survey their response was removed. Consequently, not having completed the survey was an exclusion criterion. 43 participants met this exclusion criterion and were therefore excluded, which resulted in a final sample of 113 participants. Of these 113 participants, 80 (71 %) were female, 32 (28 %) male, and 1 (1%) other. Their ages ranged from 19 to 30 (M=22.7, SD=2.2). 60 (53%) were German, 43 (38%) Dutch, and 10 (9%) Other.

Materials

The data was collected through an online survey which was created with Qualtrics, a virtual survey tool. For this survey, several scales were chosen that examined the variables relevant to the hypotheses.

Demographics

First, demographic questions were asked. The participants had to type their age in an open field, and could further choose several response options for their gender, ranging from "female", "male", "non-binary/third gender" to "prefer not to say". The last two demographic questions asked about whether their nationality was "German", "Dutch" or "Other" and whether the students were Bachelor, Master or PhD students.

BFI scale

The first content-related scale is the "Big Five Inventory (BFI)" scale. This scale offers 44 statements to which the participant has to indicate whether the statement fits his or her personality or not. The BFI is said to have good convergent and discriminant validity (John & Srivastava, 1999). For this study, only the subscales for the traits neuroticism and extraversion were used, as the remaining subscales of the BFI scale target personality traits that were not

investigated in this study. The first subscale includes eight items that refer to the trait neuroticism. A Cronbach's Alpha value of α= .86 was found for this subscale, indicating high reliability. An example statement for this trait is "I see myself as someone who worries a lot" (John & Srivastava, 1999). The next subscale includes eight items that refer to the trait extraversion. A Cronbach's Alpha value of α= .89 was found for this subscale, indicating high reliability as well. An example statement for this trait is "I see myself as someone who is full of energy" (John & Srivastava, 1999). A five-point Likert scale was used ranging from "disagree strongly" to "agree strongly" for both subscales.

MHC-SF scale

The next scale is the "Mental Health Continuum – Short Form" scale which measures well-being in emotional, social and psychological dimensions with 14 questions that ask the participants about their mental well-being in the last month (Lamers et al., 2012). Overall, high validity scores have been reported for this scale (Lamers et al., 2012). The first subscale includes three items that refer to emotional well-being. A Cronbach's Alpha value of α= .83 was found for this subscale, indicating high reliability. An example item for the first subscale is "During the past month, how often did you feel satisfied with life?" (Lamers et al., 2012). The next subscale consists of five items and refers to social well-being. A Cronbach's Alpha value of α= .78 was found for this subscale, indicating good reliability. An example item for this subscale is "During the past month, how often did you feel that you belonged to a community […]?" (Lamers et al., 2012). The last subscale includes six items and refers to psychological well-being. A Cronbach's Alpha value of α= .76 was found for this subscale, indicating good reliability. An example item of this subscale is "During the past month, how often did you feel that you liked most parts of your personality?" (Lamers et al., 2012).

The original MHC-SF scale had a six-point Likert scale but to make it fit to the other scales a five-point Likert scale for all subscales was chosen instead, ranging from "never" to "every day". Based on the scores a person achieves on each subscale, the person's well-being level can be determined (Keyes, 2009). An individual is considered to be "flourishing" when at least one out of the three items from the first subscale and six out of 11 items from the remaining subscales are scored with the highest two scores (Keyes, 2009). For this study these were "every day" and "two or three times a week". Similarly, an individual can be considered to be "languishing" when at least one out of the three items from the first subscale and six out of 11 items from the remaining subscales are scored with the two lowest scores (Keyes, 2009). For this

study, this was "never" or "once or twice a month". An individual that is classified as neither, can be considered "moderately mentally healthy" (Keyes, 2009).

PsyFlex scale

The last scale used was the "PsyFlex Scale", which measures psychological flexibility and has been proven to have good convergent, divergent and incremental validity (Gloster et al., 2021). The Cronbach's Alpha for this scale was α= .77, showing good reliability. The 6 items consist of statements that relate to the ability to be psychologically flexible. The participant was asked to indicate how much they felt able to do what was described in the statement in the past month. An example item is "Even if I am somewhere else with my thoughts, I can focus on what's going on in important moments" (Gloster et al., 2021). Again, a five-point Likert scale was used ranging from "very seldom" to "very often".

Procedure

The participants were provided with a link to the study either through the SONA website on which they could sign up for the study or through the distribution of information about the study on social media. When accessing the survey, the participants were first informed about the content and reason for the study. Next, they were asked to give their consent to the use of their data and had to declare that their participation was voluntary and that they understood all information that was provided to them (see Appendix A).

As a next step, the participants were asked to state their age, gender, nationality and study level. After these demographic questions, the first content-related questionnaire, BFI, had to be filled out, which asked about the participant's personality. The next questionnaire, MHC-SF, asked about the participant's mental well-being. Lastly, the participants were asked to fill out the Psy-Flex questionnaire about psychological flexibility.

After the completion of these questionnaires, the participants were thanked for their participation and were reminded that if they had questions, they could contact the researchers through the contact details provided at the end of the survey.

Data analysis

The statistics programme IBM SPSS version 27 was used for the data analysis. Before starting with the analysis process the data set was prepared. First, all incomplete responses were removed from the data set. As a next step, the demographic variables were coded and labelled with labels such as "age". The latter variable was originally a string variable and was changed

to a numeric variable. Further, for the personality scales six items in total had to be reverse coded. For both neuroticism and extraversion this was the case for the second, fifth and seventh item. As a next step, all items from the scales and subscales were named and computed into sum scores, resulting in four new variables.

As a next step, the statistical assumptions of normality, equal variance, linearity and independence were tested. To test the assumption of normality a Shapiro-Wilk test was conducted. To test the assumption of equal variance the Levene's test was used. Furthermore, to test the assumption of linearity, scatterplots were created for the outcome, predictor and mediator variables. To test the assumption of independence, box plots were created for each of the descriptive variables, age, gender, nationality and study level with each variable from the scales.

In order to test the internal consistency of the scales and subscales a reliability analysis for all scales was conducted. As a next step, descriptive statistics were run for all demographic variables in order to get insights into the means and standard deviations for those variables.

Furthermore, the hypotheses of the study were tested using the statistics programme PROCESS Macro version x4.1 by Andrew Hayes (Hayes, 2013). For the first hypothesis "After the pandemic, student's neuroticism negatively relates with their well-being levels through being negatively associated with their psychological flexibility", neuroticism was indicated as the predictor variable, well-being as the outcome variable and psychological flexibility as the mediating variable. For the analysis model number four was used, which is specifically designed for mediation analyses.

For the second hypothesis "After the pandemic, student's extraversion positively relates with their well-being levels through being positively associated with their psychological flexibility", the variable extraversion was chosen as the predictor variable, well-being as the outcome variable and psychological flexibility as the mediating variable. The same procedure of using the PROCESS Macro tool was applied for this analysis as well.

Results

Descriptive Statistics

The table below shows the descriptive statistics and correlations for the variables of extraversion, neuroticism, well-being and psychological flexibility. For the variable extraversion a small standard deviation was found, indicating that most scores are close around the mean ($M = 26.8$, $SD = 6.6$). This means that the majority of participants scored average on the personality trait extraversion. Similar results have been found for the other personality trait variable

neuroticism (*M* = 24.4, *SD* = 6.4). Additionally, also the standard deviation for the well-being score is relatively small (*M* = 49.8, *SD* = 8.6), indicating that most sores were close around the mean. Considering the fact that the highest possible score to achieve on the MHC-SF is 70, a mean of 49.8 can be considered higher than average, which means that the majority of partici-pants scored higher than average on well-being. For the psychological flexibility variable, a small standard deviation was found (*M* = 21.9, *SD* = 3.7) indicating that most scores are close around the mean. All variables from the four scales and subscales were significantly correlated with each other, although the correlations were not very high. All corresponding p-values were significant below the 0.01 α-level. Furthermore, the variables age and well-being were nega-tively correlated. Moreover, gender was positively correlated with neuroticism, indicating a relationship between the degree of neuroticism and gender. No further correlations between the remaining demographic variables and the variables of the scales and subscales were found.

Moreover, the statistical assumptions were tested. To test the assumption of normality, a Shapiro-Wilk test was conducted. It showed that the variables well-being, extraversion, neu-roticism and psychological flexibility all followed normal distributions (W (113) = .99, p = .413.; W (113) = .99, p = .246; W (113) = .98, p = .188; W (113) = .98, p = .098) (see Appendix B). Furthermore, the Levene's test of equal variance showed good equal variance for all varia-bles, hence the assumption of equal variance was met (see Appendix C). Also, the assumption of linearity was met for all variables (Appendix D). Further, the assumption of independence was also met (see Appendix E).

Table 1

Descriptive Statistics and Pearson's Correlations for Extraversion, Neuroticism, Well-being, Psychological Flexibility, Age and Gender

	Mean	SD	Extraversion	Neuroticism	Well-being	Psychological flexibility	Age
Extraversion	26.83	6.64	1	-.44**	.53**	.36**	.02
Neuroticism	24.43	6.43	-.44**	1	-.41**	-.41**	-.06
Well-being	49.84	8.60	.53**	-.41**	1	.54**	-.19*
Psychological Flexibility	21.87	3.66	.36**	-.41**	.54**	1	-.08
Age	22.66	2.24	.02	-.06	-.19*	-.08	1

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Mediation analysis

In order to test the two hypotheses a mediation analysis using PROCESS Macro was conducted. The overall significance for the model with neuroticism is good (R^2 = .36, F(3, 109) = 20.77, p < .001). For the corresponding hypothesis "After the pandemic, student's neuroticism negatively relates with their well-being levels through being negatively associated with their psychological flexibility" the predicting variable is neuroticism, the outcome variable is well-being and the mediating variable is psychological flexibility. It was found that neuroticism negatively influences psychological flexibility to a significant degree (b = -0.24, t = -4.77, p < .001). Moreover, the covariate age was significant in this model (p = .034). Furthermore, according to the results psychological flexibility predicts and has a partial indirect effect on well-being (b = 1.01, t = 5.11; b = -0.24, 95% CI = [-0.38, -0.12]). Consequently, high levels of neuroticism are associated with lower levels of well-being and this relationship is mediated by lower levels of psychological flexibility. Hence, the hypothesis H1 can be accepted (see Figure 1).
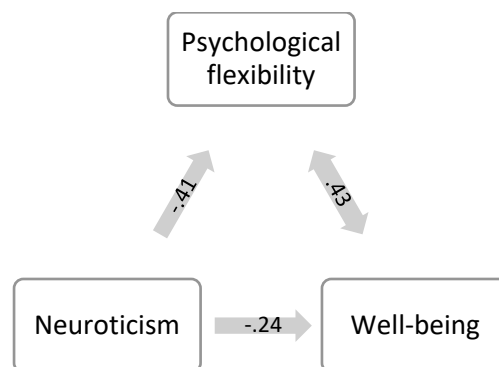
Psychological flexibility

-.41   .43

Neuroticism   -.24   Well-being

Figure 1 Mediation model of the effect of neuroticism and the indirect effect of psychological flexibility on well-being

The overall significance of the model with extraversion is good too (R^2 = .44, F(3,109) = 29.05, p < .001). The corresponding hypothesis is "After the pandemic, student's extraversion positively relates with their well-being levels through being positively associated with their psychological flexibility." In this case extraversion was the predicting variable, well-being was the outcome variable and psychological flexibility was the mediating variable. It was found that extraversion predicts psychological flexibility (b = 0.20, t = 4.13, p < .001). Additionally, the covariate age was significant in this model (p = .026). Further, psychological flexibility predicts and has an indirect effect on well-being (b = 0.91, t = 5.05, p < .001; b = 0.18, 95% CI = [0.09, 0.29]). Therefore, high levels of extraversion are associated with higher levels of well-being

and this relationship is mediated by high levels of psychological flexibility. Hence, the hypothesis H2 can be accepted (see Figure 2).
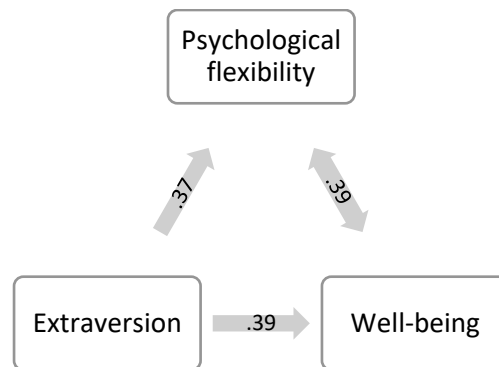

Figure 2 Mediation model of the effect of extraversion and the indirect effect of psychological flexibility on well-being

Discussion

The aim of this study was to investigate in what ways psychological flexibility mediates the relationship between personality and well-being in the post-Covid context. More specifically, the personality traits neuroticism and extraversion were chosen and put into relation with psychological flexibility and well-being. The findings indicate that for both personality traits, psychological flexibility serves as a mediator in the relationship of the respective trait with well-being. However, only a partial mediation for both models could be found, indicating that the personality traits still explained a lot of the effect on well-being. Neuroticism had a negative effect on psychological flexibility and on well-being, whilst extraversion had a positive effect on psychological flexibility and on well-being.

The first hypothesis "After the pandemic, student's neuroticism negatively relates with their well-being levels through being negatively associated with their psychological flexibility" could be accepted. A partial mediation of psychological flexibility on the relationship between neuroticism and well-being had been found. These findings are similar to those of past research, as in the studies of Steenhaut et al. (2019; 2020), psychological flexibility also proved to have an indirect effect on well-being. Also, in these studies only a partial mediation of psychological flexibility on the relationship between neuroticism and well-being was found. However, contrary to the current study, Steenhaut et al. (2019; 2020) used the construct subjective well-being which includes an affective and a cognitive component. Subjective well-being is often seen as connected to hedonic well-being, also called emotional well-being (Thrash, 2021). The present study, however, makes use of a more multi-dimensional well-being construct, which includes

the sub-components emotional well-being, social well-being and psychological well-being. Hence, it included the emotional well-being construct but additionally measured social and psychological well-being, also referred to as eudaimonic well-being (Keyes, 2009).

Moreover, contrary to the present study, Steenhaut et al. (2019) found a complete mediation of psychological flexibility on the relationship between neuroticism and life satisfaction, a sub-component of subjective well-being also referred to as cognitive well-being. This means that psychological flexibility explains the relationship between neuroticism and life satisfaction to a large extent. Further, it seems plausible that an individual who is seen as neurotic would most likely be psychologically inflexible and as a result would report lower life satisfaction. Whereas, according to Lucas and Moore (2020), someone who is psychologically flexible possesses the ability to respond flexibly to life events whilst keeping track of one's own goals and ideals which is highly important for life satisfaction.

Further, the second hypothesis "After the pandemic, student's extraversion positively relates with their well-being levels through being positively associated with their psychological flexibility" can also be accepted. A partial mediation of psychological flexibility on the relationship between extraversion and well-being was found. These findings are similar to the findings from the studies of Steenhaut et al. (2019; 2020), in which a partial mediation effect was found too. Again, attention has to be drawn to the fact that different well-being constructs were used. Similar to the findings on neuroticism mentioned above, Steenhaut et al. (2019; 2020) found psychological flexibility to fully mediate the relationship between extraversion and life satisfaction. This underlines the fact that psychological flexibility seems to be an important factor for life satisfaction, the subcomponent of subjective well-being.

When investigating the reason why psychological flexibility had a full indirect effect on life satisfaction but not on subjective well-being as a whole or on well-being as a multi-dimensional construct, it becomes obvious that psychological flexibility did not seem to be able to explain enough of the relationship between personality and well-being. The findings of this study indicated that both personality traits still had a direct link to well-being when psychological flexibility was controlled for. Hence, there might be more subcomponents of well-being, other than life satisfaction, that psychological flexibility cannot explain enough of in order to have a full mediation effect. This means that psychological flexibility is not the only influential factor for the relationship between personality and well-being. According to Westerhof and Keyes (2010), well-being can be seen as constituted of social, psychological and emotional well-being. Further, Thrash (2021) stated that life satisfaction is related to emotional well-being. Consequently, investigating constructs that relate to personality as well as to social or

psychological well-being can be regarded as valuable. As a result, a more conclusive picture of how the relationship between personality and well-being is constituted can be achieved. Nevertheless, psychological flexibility had a significant effect on this relationship, which shows that psychological flexibility is a vital concept when it comes to improving well-being levels in times of the recovery from the pandemic.

Strengths

A strength of this study is that it bridges the gap in existing literature on this model conducted in times of recovery from the Covid-19 pandemic. Hence, the findings of this study can contribute to the exploration of resilience factors such as psychological flexibility that can aid in protecting as well as strengthening well-being in the aftermath of impactful events such as the Covid-19 pandemic. Consequently, the present study shows that resilience factors are of paramount importance for future protection of well-being against adverse mental health effects. Furthermore, this study sheds light on the connection between psychological flexibility, personality and well-being, at a measured point in time, within a target group that has not been subject of many studies in the post-pandemic context.

Another strength of this study is that the psychometric properties of the measurement scales used in this study show good to high validity in past research. For example, for the well-being scale, it can be assumed that it measures the students' level of well-being at the time of data collection to a very satisfactory degree. Hence, one can assume that the collected data on well-being gives an accurate description of the students' level of well-being at that particular moment in times of the recovery from the pandemic. Further, this strength of high validity also applies to the remaining scales measuring personality and psychological flexibility, and hence, proves to be an appropriate tool for future research on these constructs. Beyond, the reliability of all three scales and its subscales was tested which resulted in good to high reliability, which increases the replicability of this study.

Limitations

A limitation that has been found is that the majority of participants of this study were female and only a small number were male or non-binary. As gender has been associated with well-being by previous research (Batz-Barbarich et al., 2018), this means that the insights gathered from this study were primarily influenced by a female perspective and might not be as representative of the experiences of all genders in the post-pandemic context.

Further, the data on which the present study is based on was gathered through a self-report measure. To give an example, this means that the students assessed their state of well-being themselves by choosing the degree to which they agree to the questions from the questionnaires. A drawback of self-report measures is the possibility for participants to answer the questions in a way that matches society preferences (Richter & Johnson, 2001). This indicates that they can choose their responses to be socially desirable which might not necessarily lead to the most honest answer (Richter & Johnson, 2001). Hence, for the well-being questionnaire that could mean that there was a possibility that the participants answered the questions in a biased and dishonest way.

Another limitation that has been found is that the present study only made use of one-time survey administered data. This indicates that the results of this study only reflect the levels of well-being and psychological flexibility and the degree of the two personality traits of one moment in time. Hence, only between-participants and no within-participants comparisons can be made which means that it is unclear how the levels of the measured constructs within the target group are constituted over a longer period of time.

Recommendations for future research

A suggestion for future research could be to include multiple student populations from different countries around the world and include that effect as a confounding variable. As the post covid situation is new, it could be of great interest to measure the constructs at hand in differing populations in order to arrive at a more accurate picture of how the recovery from the pandemic is experienced within students across the globe. To see how students are affected in the aftermath of the pandemic and to test the relationship of psychological flexibility, personality and well-being in a more varied sample could offer more conclusive insights into the importance of psychological flexibility in the context of the recovery from a crisis. As a next step, possible interventions with the aim to strengthen psychological flexibility could lead to students being better prepared for crises in the future.

Further, a recommendation is to use pre-and post-measurements instead of one-time measurements as that can provide an understanding of how the levels of the constructs are constitutes within participants over a longer period of time. As the well-being and psychological flexibility constructs can fluctuate over time (Steenhaut et al., 2019), it could be of great interest to investigate them over a longer period of time. By using two measures in the post-pandemic context, it is therefore possible to say with greater certainty what the levels of well-being and

psychological flexibility of students are over time in the recovery phase from the pandemic. Moreover, an experimental set up could offer the possibility to introduce an intervention on strengthening psychological flexibility within university students. One measure of all three constructs could be conducted before the intervention and one measure after the intervention process. It could then be measured if and in what ways psychological flexibility increased and how it affects the relationship of personality and well-being over time. In this way, it is possible to obtain results that have a higher validity than the present study can offer.

Conclusion

When looking at the aim of this study, one can say that the gap of knowledge on the influence of personality and psychological flexibility on well-being in the post-Covid context within university students has been narrowed. Personality, and more specifically the traits neuroticism and extraversion, were found to be predictor variables of student well-being and psychological flexibility was found to partially mediate these relationships. This underlines the importance of psychological flexibility in the times of recovery from adverse effects of the pandemic. Past research has identified that training psychological flexibility could significantly help people in challenging times and protect well-being. In order to be more prepared for future crises it can be advised to incorporate the training of this skill in future interventions designed for university students in times of recovery.

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Appendices

Appendix A – Consent form

Dear participant,

As the pandemic seems to have reached its end, this research investigates which factors influence resilience and well-being after the challenging COVID-19 pandemic. It is conducted by two third-year Psychology students. The pandemic notably affected mental well-being, especially in students, due to the tight restrictions on work and social life. However, not everyone is affected by the pandemic in the same way. Participation in this study will provide useful insights into how resilience can be strengthened, so it might contribute to the recovery from the pandemic's negative effects. Also, it might help to be better prepared for future crises.

The research includes an online questionnaire, which will take approximately 15 minutes to answer. First, demographic questions are asked (such as gender, age, and nationality), after which several questions and statements about well-being and resilience, among others, will follow. The research has been reviewed and approved by the BMS ethics committee. Participation will take around 15 minutes.

The data that is collected will be processed anonymously. No data that could lead to you as a person will be used. The data will only be accessible to the two researchers whose contact details are mentioned below, and will only be used for the purposes of this research. It will be safely stored and at the end of the research period, the collected data will be deleted. As a participant, you are able to withdraw at any time without any consequences during participation. However, it is not possible to withdraw from participation after your answers have been submitted. Furthermore, you have the right to request access to your data and to rectify or erase personal data. As the questionnaire contains questions and statements about well-being, resilience, personality, and social support, this could momentarily trigger people that suffer from mental health issues. Nonetheless, it is expected that participation in this research will not entail any risks.

If you have questions about your rights as a research participant, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researchers, please contact the Secretary of the Ethics Committee/domain Humanities &

Social Sciences of the Faculty of Behavioural, Management and Social Sciences at the University of Twente. Any questions regarding the content of the research or the procedure can be asked to the researchers who are mentioned below.

Thank you very much for your interest in this research, and for your willingness to participate.

Kindest regards,

Lucy Weßelborg
Maaike Jansen

By answering 'I agree with the abovementioned information and want to participate in this study', you agree to have read and understood the information regarding this study. You consent voluntarily to be a participant in this study and understand that you can refuse to answer questions and you can withdraw from the study at any time, without having to give a reason.

- o   I agree with the abovementioned information and want to participate in this study
- o   I don't want to participate in this study

Appendix B – Shapiro-Wilk test

Table 2

Tests of Normality with the Shapiro-Wilk test

	Statistic	df	Sig.
Well-being	.99	113	.413
Extraversion	.99	113	.246
Neuroticism	.98	113	.188
Psychological flexibility	.98	113	.098

Appendix C – Levene's test

Table 3

Levene's Test of Equality of Error Variances

Dependent variable: well-being	Levene Statistic	df1	df2	Sig.
Neuroticism	1.23	22	87	.245
Extraversion	1.00	22	85	.479
Psychological flexibility	1.22	14	96	.275

Appendix D – Testing the assumption of linearity

Simple Scatter of Well-being by Neuroticism

Simple Scatter of Well-being by Extraversion

R² Linear = 0,275

Simple Scatter of Well-being by Psychological Flexibility

R² Linear = 0,295
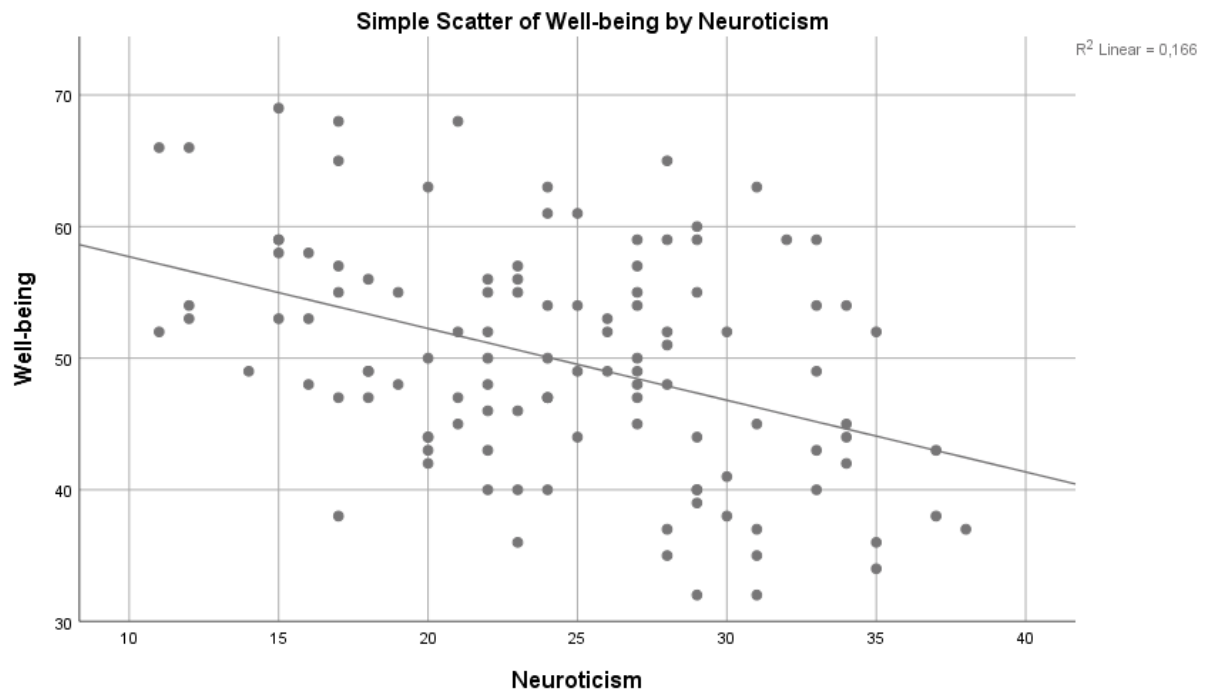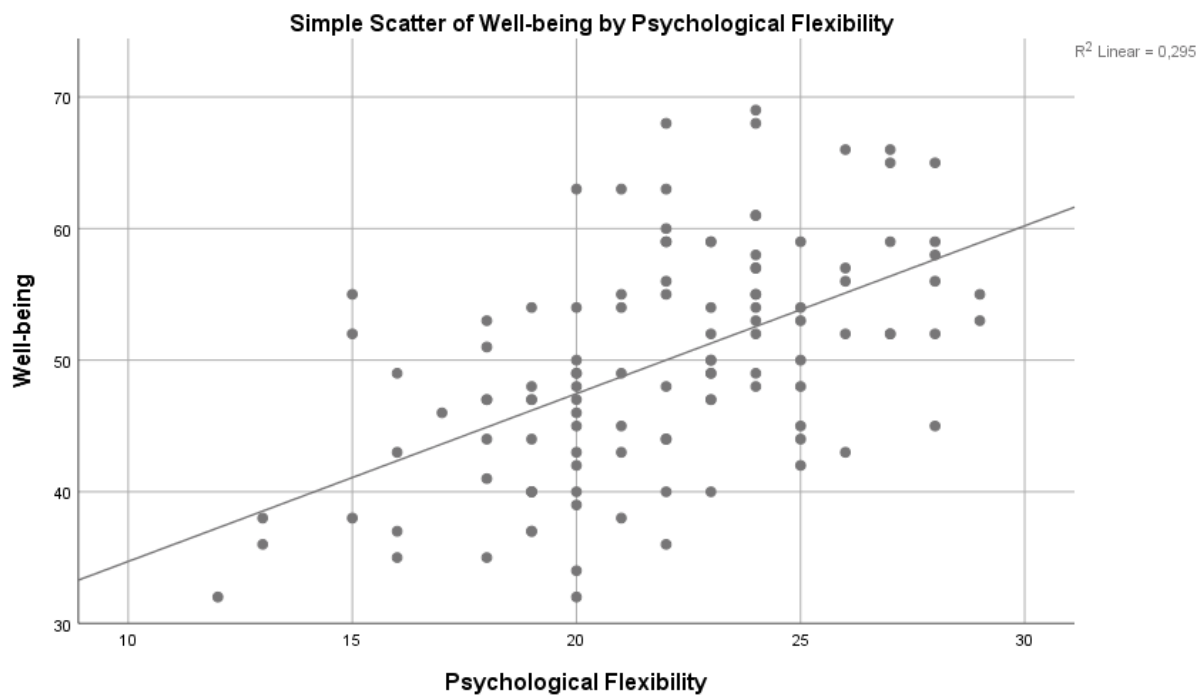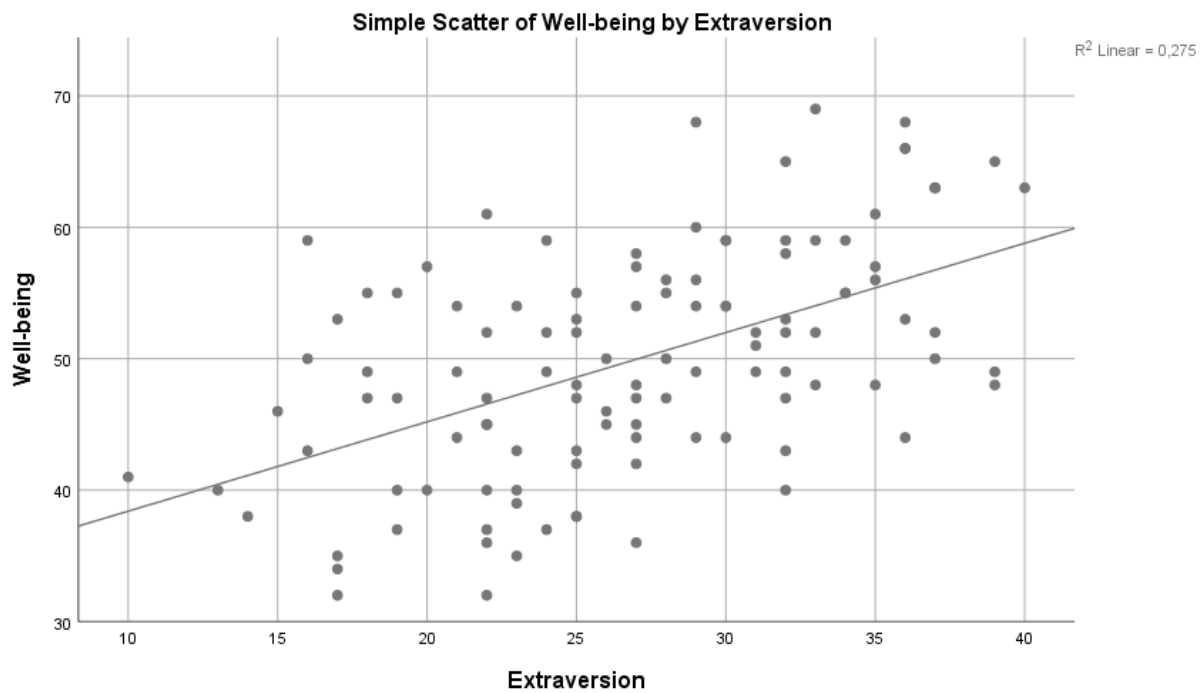
Appendix E – Testing the assumption of independence

Simple Boxplot of Well-being by Age

Simple Boxplot of Neuroticism by Age

Simple Boxplot of Extraversion by Age

Simple Boxplot of Psychological Flexibility by Age

Simple Boxplot of Well-being by Gender

Simple Boxplot of Neuroticism by Gender

Simple Boxplot of Extraversion by Gender

Simple Boxplot of Psychological Flexibility by Gender

Simple Boxplot of Well-being by Nationality

Simple Boxplot of Neuroticism by Nationality

Simple Boxplot of Extraversion by Nationality

Simple Boxplot of Psychological Flexibility by Nationality

Simple Boxplot of Well-being by Studylevel

Simple Boxplot of Neuroticism by Studylevel

Simple Boxplot of Extraversion by Studylevel

Simple Boxplot of Psychological Flexibility by Studylevel