How does Neuroticism Influence the Relationship between Self-Regulation and Well-Being in University Students?

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Abstract

In recent studies, it was indicated that self-regulation can be a means to well-being. Furthermore, there is research which includes personality traits as key factors to improve self-regulation. However, there has been less research on the connection between self-regulation and neuroticism compared to the other Big Five traits. Therefore, the purpose of this research was to investigate if neuroticism has a moderation effect on the relationship between self-regulation and well-being.

A Qualtrics survey was conducted which included the Mental Health Continuum-Short Form, the Self-Regulation Questionnaire Short-Form, and the 12-Item Neuroticism Scale. The dataset was analysed by using the SPSS 27 Software and the focus was on the descriptive statistics, correlations, and the moderation analysis.

The results showed significant findings supporting a positive relationship between self-regulation and well-being. However, there was no moderation effect of neuroticism on the relationship.

A possible explanation might be that the sample size or the study design did not suffice to indicate moderation effects. Another implication might be that neuroticism can opposingly act as a facilitator for motivation and effort to self-regulate. In conclusion, the study supports that self-regulation strategies can be implemented to increase well-being. Additionally, personality traits can be considered in future interventions to tailor the strategies to each individual.

Keywords: Well-being, self-regulation, neuroticism, moderation

The Influence of Neuroticism on the Relationship between Self-Regulation and Well-Being in University Students

In recent years, there has been an increased report of lower mental health and well-being among university students. According to a global survey (N = 13,984), 35% of the students had a history with at least one of the DSM-IV mental disorders (Auerbach et al., 2018). Even though higher education is not identified as the cause for the decrease in well-being, it can be seen as a significant contributor to the stress in a student´s life (Duffy et al., 2020). This can lead to depressive and anxiety symptoms which in turn reduce the psychological well-being of students, accompanied by reduced general health, social functioning, and fatigue (Jenkins et al., 2020). Another study suggests that these mental health issues can significantly affect the academic performance of students negatively which might even lead to them dropping out of their current courses (Eisenberg, Hunt & Speer, 2013). Despite the stressors which come with the higher education context, students with high levels of self-regulation showed better coping abilities and lower levels of mental health problems. Thus, self-regulation can be seen as one of the aspects which can increase students´ well-being and support them in their academic achievement (Rodríguez et al., 2022). A growing body of research suggests the importance of personality when it comes to students' well-being and self-regulation. Thus, the Big Five personality model shows how personality traits can even have a significant impact on learning and academic achievement when placed in the educational context. In previous research, neuroticism is the only personality trait which predicts lower self-regulation and well-being, as well as decreased coping and adapting abilities (de la Fuente et al., 2020).

Well-Being

According to the World Health Organization, well-being can be defined as a general way of being instead of only the absence of disease (WHO, n.d.). The American Psychological Association defines this state as "a state of happiness and contentment, with low levels of distress, overall good physical and mental health and outlook, or good quality of life." (APA, n.d.). Furthermore, Huppert (2009) adds that a valuable predictor of well-being is effective functioning. He includes that there are factors which are essential to effective functioning, such as developing one´s own potential and having control, a sense of purpose as well as positive relationships (Huppert, 2009). Keyes (2003) also related well-being to functioning but distinguishes between two dimensions, namely mental health, and mental disorder. Well-being is indicated by the mental health dimension, whereas the mental disorder dimension shows the existence or absence of psychopathology (Keyes, 2003).

When it comes to the operationalization of mental health, Keyes (2003) combined emotional, social, and psychological well-being. For instance, emotional well-being can be categorized as more subjective since it focuses on the life satisfaction and general level of happiness (Langeland, 2014). Additionally, life satisfaction is based on the cognitive appraisal of individuals (Lamers et al., 2011). Emotional well-being is different than psychological well-being since the psychological dimension focuses more on the development and the challenges in life. For instance, relevant topics are personal growth or purpose (Ryff, 1989). The third dimension, social well-being, includes how an individual functions in his or her social life based on social actualization or social acceptance (Keyes, 1998, 2002). The three dimensions of well-being can be seen as mutually inclusive since

there is an overlap between them. Thus, it is possible to measure an individual´s overall level of well-being by taking the three dimensions together (Keyes & Annas, 2009).

One aspect, which has continuously been linked to well-being, is self-regulation. Self-regulation has crucial implications when it comes to an individual´s levels of well-being throughout his or her life (McClelland et al., 2017). A study conducted in 2021 found that there was a significant positive effect of self-regulation on well-being in undergraduate students (Salleh, Ismail & Idrus, 2021). This was taken a step further by including self-regulation tasks to a study to measure if they have a positive influence on well-being and academic performance. The study found that students reported higher levels of academic achievements which in turn showed an increased level of well-being due to the application of self-regulation strategies. These strategies mainly involved goal-orientation (Wang, Yang & Li, 2022).

Self-Regulation

According to the American Psychological Association (n.d.), self-regulation is about controlling one´s behaviour by implementing self-monitoring, self-evaluation, and self-reinforcement. Self-monitoring is seen as keeping track of the behaviour. Self-evaluation is the term used for the assessment of the information which results through the self-monitoring process. And lastly, self-reinforcement is defined as the reward one gives him or herself for executing the behaviour or reaching the initial goal (APA, n.d.). Another definition of self-regulation includes the monitoring and evaluation of the own internal states which lead to identifying discrepancies. Once identified, the thoughts, feelings, and behaviours of an individual can be adapted accordingly so that he or she can achieve their personal goals (Ramli et al., 2018). According to Zimmerman (2000), self-regulation involves having

control over environmental influences, which also include emotional and cognitive processes such as feelings and thoughts. This skill is not only important for temptation resistance, but also for setting, controlling, and directing the achievement of a personal goal (Hofer et al., 2010). Bandura (1989) defines self-regulation as acting intentionally and purposefully from within.

Self-regulation has further been described as the ability to control responses from within, which can be based on behavioural or physiological factors. Physiological factors would refer to temperament and behavioural factors would be stemming from personality (Thomson & Jaque, 2017). A four-level model of development of self-regulation has been created by Zimmerman and Schunk which includes internalization as a key factor to improve self-regulation (2004). Besides identifying the goals and tracking the achievements, they also distinguished between different types of learners, divided into proactive and reactive. Thus, Zimmerman and Schunk supported the importance of individual differences when it comes to increasing self-regulation (2004). These individual differences were also considered in the action control theory of self-regulation, which emphasized that individuals´ predispositions are less researched but fundamental sources for the development of self-regulation (Kuhl, 1985). Individual predispositions are also defined as personality traits (Bidjerano & Dai, 2006).

Neuroticism

Personality traits can be seen as a consistent pattern of thinking, feeling, or behaving which is characteristic to each individual in different situations (Soto, 2018). Neuroticism is part of the Big-Five personality traits along with Extraversion, Agreeableness, Conscientiousness, and Openness to Experience (Widiger & Oltmanns, 2017).

Previous research indicated the importance of considering personality traits when it comes to measuring important life outcomes (Soto, 2018). Thus, it is important to consider the personality traits in the context of the influence on well-being. Especially neuroticism has been found to be a strong predictor of well-being and health in general (Lahey, 2009). Neuroticism is seen as a personality trait which has a negative influence on well-being since it combines negative effects, such as anger, anxiety, and depression. Furthermore, people who are high in neuroticism have a higher chance to be self-conscious, irritable, and emotionally unstable (Widiger & Oltmanns, 2017).

Some studies showed a negative correlation between neuroticism and academic performance which is an important goal for students to aim for. According to these studies, the anxiety and negative feelings lead to lower memory and confidence (Nechita et al., 2015). Other research suggests that neuroticism does not necessarily correlate with academic performance but only has an effect on how a person evaluates their own image and intelligence which has an influence on the coping ability (Nechita et al., 2015).

In general, university students are more prone to experience psychological distress since this has also been identified as a common problem in higher education. For instance, students are expected to adapt to a different system right after high school which requires them to possess active coping strategies and adapt to the diverse and challenging environment of a university (Krifa et al., 2022). This highlights the importance of self-regulatory skills for students in the university environment.

However, there has been a link between neuroticism and higher levels of impulsivity and lower levels of self-control (Eysenck & Eysenck, 1977; Tangney et al., 2004). Thus, students who show high levels of neuroticism would also show lower levels of self-

regulation. This would cause difficulties with adopting coping strategies to overcome stressors (de la Fuente et al., 2020). On the other side, neuroticism was found to be a facilitator for motivation and effort. This is supported by defensive pessimism which means that an anxious individual takes action to prevent failure since there is a higher level of anticipation for it (Norem & Cantor, 1986).

Overall, there has been more research on the connection between self-regulation and the other Big Five traits compared to the link between self-regulation and neuroticism (Bidjerano & Dai, 2006). That is why there is a need for further research on the effect of neuroticism since it has mainly been associated with negative emotional experiences rather than a lower level of self-regulation (Clark & Watson, 1999).

Well-Being, Self-Regulation and Neuroticism

Looking at the relationship between self-regulation and a personality trait, in this case neuroticism, would allow to measure if personality traits can have an influence on the relationship between self-regulation and well-being. Self-regulation requires a person to show inhibition of impulses, desires, and temptations (Heatherton, 2011). Additionally, it is important to partake in behaviours or actions which one might not prefer or ignore intrusive thoughts that might come up (Heatherton & Vohs 1998). These requirements are especially hard to be met by a person with a high neurotic personality since neuroticism includes a decreased level of self-control (Eysenck & Eysenck, 1977; Tangney et al., 2004).

Besides these requirements, self-regulation also needs to involve proactivity when it comes to regulating one´s behaviour and emotions (Heatherton, 2011). According to a study by de la Fuente et al. (2020), students who showed high levels of neuroticism showed lower

levels of self-regulation which caused difficulties to cope and adapt. Nevertheless, self-regulation might be a crucial aspect to consider in the context of well-being and neuroticism. There is evidence which supports that self-regulatory skills can indeed increase well-being (Hofer et al., 2011). Other evidence shows that these skills can also decrease depression and stress levels (Park et al., 2012; Zhao et al., 2019).

Overall, there is a need for further research on how neuroticism influences the relationship between self-regulation and well-being (Durand-Bush et al., 2015). More specifically, the aim is to find out if a higher level of neuroticism would have a negative moderation effect on the relationship between self-regulation and well-being.

Current Paper and Target Group

Based on these evidences and previous studies, this research paper will aim to specifically investigate whether the expected positive relationship between self-regulation and well-being depends on a person's level of neuroticism.

The target group consists of university students since university students are more prone to experience psychological distress caused by the expectation to possess active coping strategies and adapt to the diverse and challenging environment of a university (Krifa et al., 2022). Furthermore, it has been shown that high levels of neuroticism would indicate lower levels of self-regulation in students (de la Fuente et al., 2020).

Based on the research findings, it will be possible to come up with future recommendations on how to support students who show high levels of depression, anxiety, or lower self-control in order to increase their levels of well-being and consequently academic performance.

Research Question and Hypotheses

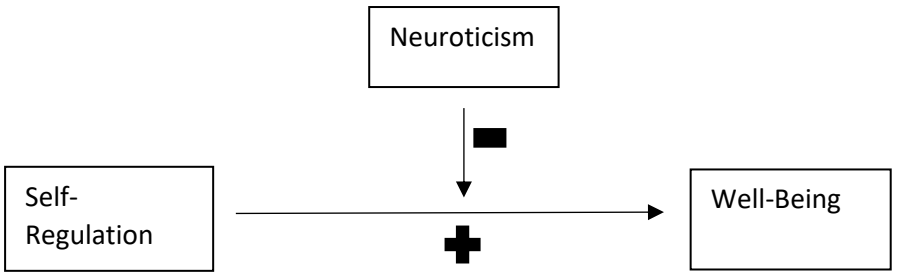
RQ: How does neuroticism influence the relationship between self-regulation and well-being?

H1: There is a positive relationship between self-regulation and well-being in university students.

H2: Neuroticism moderates the relationship between self-regulation and well-being in university students.

Figure 1

Model for Research Question



Methods

Design

The research investigates how neuroticism influences the relationship between self-regulation and well-being. The outcome variable is well-being. The predictor variables are neuroticism and self-regulation.

Participants

The only inclusion criteria was that the participants had to be students at a university and speak English. The participants were recruited mostly due to the use of the convenience sampling method since the study was published on the SONA website of the University of Twente. After completion of the survey, the participants who are students at the University of Twente, received 0.25 SONA credit points. Non-UT participants were recruited by the snowball method and also via survey exchange websites. In total, 77 participants between the ages of 18 and 32 took part in the survey ($M = 21.49$, $SD = 3.05$). 23 of the participants identified as male, and 51 of them as female. 3 participants identified as non-binary or preferred not to answer. Additionally, the students differed in their nationalities, including Dutch ($n = 23$), German ($n = 41$), and Other ($n = 13$).

Materials

Before recruiting the participants, the Qualtrics software was used to set up the survey, which was then published on the SONA System website. To access the Qualtrics

survey, the participants needed to own a device with an internet connection, such as a laptop or a mobile phone. A consent form was included in the beginning of the survey, with a brief description of the research and the conditions under which the participants could indicate their agreement or disagreement to take part in the study (see Appendix A). The consent form was followed up by a demographics section, which included general questions about the age, nationality, sex, and the occupation of the participants. The survey itself consisted of self-report scales measuring well-being, self-regulation, and neuroticism.

Measures

Well-Being

Well-being was measured using the Mental Health Continuum-Short Form (see Appendix B-1) (MHC-SF; Lamers et al., 2011). This scale includes 14 items in total. It can be divided into three subscales, which are emotional well-being (3 items), social well-being (5 items), and psychological well-being (6 items). The scales are measured on a 6-point Likert scale (0 = never, 5 = everyday). Example items are: “During the past month, how often do you feel satisfied with life?” (emotional well-being), “During the past month, how often did you feel that you had something important to contribute to society?” (social well-being), and “ During the past month, how often did you feel that your life has a sense of direction or meaning to it?” (psychological well-being).

By means of this scale, people can be classified as ‘languishing’ (= low level of mental wellbeing) and ‘flourishing’ (= high level of mental well-being) (Keyes, 2006). The score for the total scale ranges from 0 to 70, whereas the scores for the subscales differ from each other. Emotional well-being ranges from 0 to 15, psychological well-being from 0 to 30

and social well-being from 0 to 25. The higher a participant scores on one of the subscales, the higher their perceived level of well-being was during the past month (Keyes, 2009).

The psychometric properties of the MHC-SF were assessed in a study conducted by Luijten et al. (2019), which showed a high internal reliability (α = .91). A second study found high internal reliability as well (α = 0.89), but also added convergent and discriminant validity (Lamers et al., 2011). The reliability for each of the three subscales of the measure have all been high (α > .80) (Keyes, 2005). More specifically, the reliability values for the subscales of emotional well-being (α = 0.83) and psychological well-being (α = 0.83) are high and they are adequate for the subscale social well-being (α = 0.74) (Lamers et al., 2011).

Self-Regulation

Self-regulation was measured by including the Short Form Self-Regulation Questionnaire (see Appendix B-2) (SSRQ; Carey, Neal & Collins, 2004). The SSRQ includes 31-items and is the shorter version of the Self-Regulation Questionnaire (SRQ) (Brown et al., 1999). The questionnaire includes items such as, “I usually think before I act.”, or “I can usually find several different possibilities when I want to change something.” (Carey, Neal & Collins, 2004). The items are scored on a 1–5 scale (strongly disagree–strongly agree) which can be added to create a total score. Some of the items need to be reverse coded. The interpretation of the total score is as follows: the higher the score, the higher is the level of self-regulation.

The psychometric properties of the SSRQ showed a high correlation with the original 63-item SRQ (r = .96). It also showed good internal consistency (α = .92) (Neal & Carey, 2005). The reliability of the SSRQ is satisfactory for the total score (α = 0.89) (Potgieter & Botha, 2009).

Neuroticism

The third scale is the 12-Item Neuroticism Scale (EPQR-S) to measure the third variable, neuroticism (see Appendix B-3) (Eysenck, Eysenck & Barrett, 1985). This scale includes questions such as “Does your mood often go up and down?” and “Do you ever feel ‘just miserable’ for no reason?”. The items were measured by applying a 5-point Likert-scale (1= strongly disagree, 2= slightly disagree, 3= neither agree nor disagree, 4= slightly agree, and 5= strongly agree). The items can be summed up to create a total score. The level of neuroticism can be interpreted as follows: the higher the total score, the higher is the level of neuroticism.

The neuroticism scale showed good reliability for males ($\alpha = 0.80$) and females ($\alpha = 0.84$) (Eysenck et al., 1985). The overall internal reliability was also found to be high ($\alpha = 0.92$) (Muñiz, García-Cueto & Lozano, 2005).

Procedure

The survey was created by using the Qualtrics software. The study was then submitted to the Ethics Committee and approved for further distribution. The timeframe of the study was 23.10.2022 until 11.12.2022. The participants were recruited by publishing the survey on the University of Twente´s SONA Systems website and by using the snowball sampling method. The participants took part in the survey in the online environment with no set time or date. First, the participants received information about the study and contact details of the researcher if they have concerns or remarks about the research in future. This first section also involved the informed consent which the participants could agree or disagree to. After that, the participants filled out the Mental Health Continuum-Short Form (MHC-SF; Lamers

et al., 2011). This survey was followed by the Short Form Self-Regulation Questionnaire (SSRQ; Carey, Neal & Collins, 2004). In the next section, the participants answered the 12-Item Neuroticism Scale (EPQR-S; Eysenck, Eysenck & Barrett, 1985). After the data collection, the results were saved and the UT-student participants received SONA points (0.25 points).

Data Analysis

The collected data was imported to the IBM SPSS (27) software for the data analysis. First, a data screening was conducted to exclude cases with missing or extreme values. The data set initially included N=77 participants. Before the data could be analyzed, 3 cases were excluded from the final data set since the question "Are you currently enrolled at a university?" was answered with a "No, I am not a student.". This was followed by a check for validity and reliability of the final dataset, which was done by conducting a factor analysis for the validity and a test-retest analysis for the reliability. Thirdly, a general overview of the final dataset was created by looking for descriptive statistics, frequencies, and mean item scores. Thus, a possible floor or ceiling effect could be ruled out. The next step involved checking the statistical assumptions. More specifically, normality, linearity, and equality of variance were checked and the assumptions were met.

To test hypothesis one, Pearson correlation coefficients were computed for all three variables. To test hypothesis two, the effect of neuroticism on the relationship between well-being and self-regulation was measured. For this purpose, a regression analysis was conducted in which well-being acted as the outcome variable, whereas self-regulation was the predictor variable and neuroticism the moderator variable. More specifically, a moderation analysis was performed by using the PROCESS macro command (Hayes, 2018.).

Results

Descriptive Statistics

The scores on the well-being, self-regulation and neuroticism scales were normally distributed and did not differ significantly across gender.

Table 1

Descriptive Statistics of Well-Being, Self-Regulation, and Neuroticism

	M	SD
well-being	53.96	12.41
self-regulation	130.61	15.13
neuroticism	18.50	3.61

Note. Descriptive statistics of measurements after correction and exclusion.

Correlations

The first hypothesis: there is a positive relationship between self-regulation and well-being, was tested by a Pearson correlation analysis. Thus, a Pearson correlation coefficient was computed to assess the linear relationship between self-regulation and well-being.

There was a positive correlation between the two variables well-being and self-regulation, $r(72) = .36$, $p = .002$. This significant result leads to the acceptance of hypothesis

one. Additionally, there was no significant correlation between neuroticism and well-being ($r(72) = .37$, $p = .222$) or between neuroticism and self-regulation ($r(72) = -.03$, $p = 0.80$).

Table 2

Correlation between Well-Being, Self-Regulation, and Neuroticism

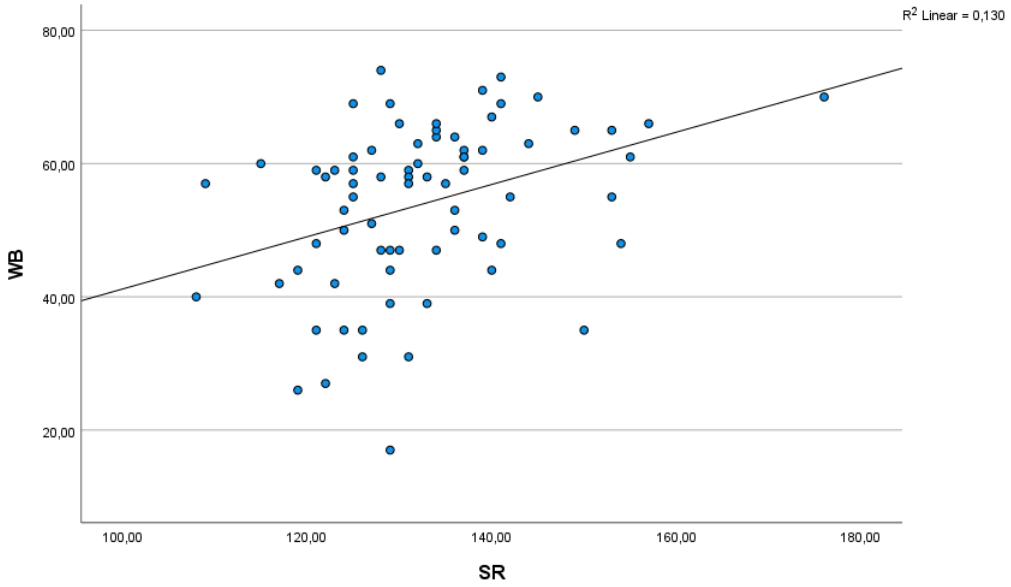
		1	2	3
1. well-being	Pearson Correlation	1	.36	.37
	Sig. (2-tailed)		.002	.222
2. self-regulation	Pearson Correlation	.36	1	-.03
	Sig. (2-tailed)	.002		.799
3. neuroticism	Pearson Correlation	.37	-.03	1
	Sig. (2-tailed)	.222	.799	

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

To demonstrate the positive relationship between well-being and self-regulation a graph was created which shows well-being as the dependent variable on the Y-axis and self-regulation as the independent variable on the X-Axis. The graph in Figure 1 depicts how an increase in self-regulation leads to an increase in well-being.

Figure 2

Effect of Self-Regulation on Well-Being



Moderation Analysis

To investigate hypothesis two: the moderating effect of neuroticism on the relationship between well-being and self-regulation, a moderation analysis was performed using the PROCESS macro extension (Hayes, 2018.). The outcome variable for the analysis was well-being. The predictor variable for the analysis was self-regulation. The moderator variable evaluated for the analysis was neuroticism.

Table 3

Moderation Analysis for the Interaction Effect of Neuroticism on the Relationship between Self-Regulation and Well-Being

	B	SE	t	Sig.	CI	
(Intercept)	-152.06	104.82	-1.45	.15	-361.11	57.00
self-regulation	1.37	0.79	1.74	.09	-0.20	2.94
neuroticism	8.44	5.78	1.46	.15	-3.08	19.97
moderation	-0.05	0.04	-1.24	.22	-0.14	0.03

The overall model was found to be significant, $R^2 = .29$, $F(3, 70) = 9.62$, $p < .001$. The interaction term was statistically non-significant ($F(1, 70) = 1.53$, $p = .221$) in the model, indicating that neuroticism was not a significant moderator of the effect of self-regulation on well-being. Thus, there was no moderation effect found which leads to the rejection of hypothesis two.

Discussion

The purpose of this study was to investigate the relationship between well-being and self-regulation. Additionally, this research explored a possible moderation effect of neuroticism on the relationship between well-being and self-regulation. With hypothesis one it was expected that there is a positive relationship between self-regulation and well-being. Hypothesis two indicated the expectation that neuroticism has a negative moderation effect

on the relationship between self-regulation and well-being. The main aim of the research was to investigate if personality traits, in this case neuroticism, can have an influence on self-regulation and well-being. The results were significant related to hypothesis one, but the findings were non-significant for hypothesis two.

Implications – Hypothesis 1

Hypothesis one, there is a positive relationship between well-being and self-regulation, was accepted. This would suggest that engaging in more self-regulation would lead to an increase in levels of well-being. Previous research indicates that self-regulatory skills can indeed increase well-being (Hofer et al., 2011). Other evidence shows that these skills can also decrease depression and stress levels (Park et al. 2012; Zhao et al. 2019). Thus, the findings regarding hypothesis one are in line with previous findings. There is a positive relationship between well-being and self-regulation.

Implications – Hypothesis 2

Hypothesis two, neuroticism moderates the relationship between well-being and self-regulation, was rejected since no moderation effect was found. This would suggest that the positive relationship between well-being and self-regulation does not change within the frame of this study when the variable neuroticism is added. Thus, it is suggested that individuals who are higher in neuroticism can still benefit from engaging in self-regulation and impacting their well-being positively.

However, the findings related to hypothesis two do not stand in line with most claims made in previous research. For instance, in one study it is shown that the requirements for self-regulation are especially hard to be met by a person with a high neurotic personality since neuroticism includes a decreased level of self-control (Eysenck & Eysenck, 1977;

Tangney et al., 2004). Besides these requirements, self-regulation also needs to involve proactivity when it comes to regulating one´s behaviour and emotions (Heatherton, 2011). According to a study by de la Fuente et al. (2020), students who showed high levels of neuroticism showed lower levels of self-regulation which caused difficulties to cope and adapt. According to these findings, neuroticism should have a moderating role in the relationship between well-being and self-regulation.

Thus, a possible explanation for the findings of this study could be that neuroticism might indeed be a facilitator for motivation and effort (Norem & Cantor, 1986). For instance, the findings might support defensive pessimism as an effective self-regulation strategy. This strategy is applied by people with high levels of anxiety and it involves setting low expectations while preparing to reach a goal (Norem, 2008). This might explain why there were no significant moderation effects on the relationship between self-regulation and well-being when including neuroticism as a third variable.

Besides the implications, there are also strengths and limitations that can be indicated regarding the research.

Strengths

A strength that is important to mention is the fact that all of the used scales are highly researched, reliable, and valid scales which included the Mental Health Continuum-Short Form (MHC-SF; Lamers et al., 2011), the Self-Regulation Questionnaire Short-Form (SRQSF; Carey, Neal & Collins, 2004) and the 12-Item Neuroticism Scale (EPQR-S; Eysenck, Eysenck & Barrett, 1985).

Another strength the study showed is that it included anonymous self-report questionnaires which allowed the participants to feel more comfortable sharing personal

information and answering truthfully. There is evidence that anonymous questionnaires led to higher measures of socially unacceptable or undesirable behaviour and thoughts compared to surveys which required the participants to identify themselves (Lelkes et al., 2012). Since there was no set date or time to take part in the survey, the participants also had the freedom to focus on the questions and answer them on their own pace without feeling any pressure.

Limitations

A crucial limitation of the research was the relatively small sample size, which consisted of 74 participants after excluding the cases according to the exclusion criteria. Thus, the results show less potential to be representative of the greater population. This would imply that more research needs to be conducted on the effect of neuroticism on the relationship between well-being and self-regulation. By recruiting more participants and increasing the sample size, the moderation analysis might show different results and include significant moderation effects.

Another point to consider is to select participants with higher scores on neuroticism before testing for moderation effects since this would allow for more accurate analysis of how neuroticism affects the relationship. The mean score for neuroticism in this study was 18.50 (SD = 3.61) which can be considered as relatively low in comparison to the mean score found in a larger sample (N = 2356). In the research conducted by Jeronimus (2015) the average mean score for neuroticism was 35.71 (SD = 9.40). The sample was more diverse with a mean age of 41.99 years (SD= 13.08). The much lower mean score in the sample of this research could be explained by the young age of the target group (M = 21.49). This is supported by research, which shows that the mean level of neuroticism decreases between late adolescence and early adulthood due to intrinsic maturation which takes place later on

(Roberts & Mroczek, 2008). High levels of stress, which are experienced during that period in life, were found to contribute to the levels of neuroticism the more the individual ages (Rutter, 2006).

A final limitation is related to the study design of the research. Self-report momentary measures depend on the individual´s own subjective perception and is not data which is measured in the laboratory (Möller et al., 2013). Furthermore, the survey was not taken in a controlled environment, which means that participants might be more inclined to give answers according to the social-desirability bias since there is no way for the researcher to measure if the answers are correct or not. This can lead to exaggerating positive qualities and under-reporting negative behaviours or feelings (Donaldson & Grant-Vallone, 2002). The social-desirability-bias can be seen as a crucial source which affects the level of validity of the data collected through survey research (Nederhof, 1985).

Conclusion

In conclusion, the study did not support a moderation effect of neuroticism on the relationship between well-being and self-regulation. Future research should focus on specific target groups to account for any external differences and conduct more surveys on how neuroticism is related to self-regulation and well-being since the sample size of this research might not have been sufficient to show any moderation effects.

Nevertheless, there was a positive relationship found between well-being and self-regulation. This suggests that people who are more able to self-regulate can indeed improve their well-being. In future research, this information can be useful when inventing methods or techniques to increase well-being in university students. Tasks or activities which include self-regulation can be implemented to maintain or increase well-being. For instance, there is

evidence that different self-regulation strategies are significantly related to the levels of well-being in students. More specifically, goal selection was found to be one of the strategies to reduce the stress that comes with future orientation and increase life satisfaction (Rodríguez et al., 2022). Furthermore, personality traits can be considered in future interventions to tailor self-regulation strategies to each student. Some self-regulation strategies, such as defensive pessimism, might work much better with highly anxious students since they strongly focus on their performance but utilize their anxiety as a driving motivator (Norem, 2008).

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Appendix

A Introduction and Informed Consent

Dear participant,

You have been invited to participate in a survey about the influence of neuroticism on the relationship between self-regulation and well-being. This survey is created by Nida Cimcir under the supervision of Martha Kreuzberg. In the following, I would like to provide you with some information about the survey and how your data will be handled.

Purpose

The purpose of this survey is to gain insight into how the relationship between self-regulation and well-being is influenced by personality traits. This research will exclusively focus on the personality trait neuroticism. The survey is divided into four parts and will take approximately 15 minutes to complete.

Conditions

Participation will be completely anonymous. Your personal information will not be shared beyond this research. In addition, all responses will remain confidential. Furthermore, there are no known risks associated with the participation in this survey. The results will only be used for the purpose of this study.

In signing this consent form you give permission for the survey data to be archived in a Qualtrics server so it can be used for the aims of this research. Your participation in this survey is voluntary. You may withdraw from this study at any time without giving a reason.

Contact

If you have any questions, want to gain further information or want to express any concerns regarding this survey, you can contact the researcher under the following e-mail address:

n.n.cimcir@student.utwente.nl

If you wish to contact anyone other than the person involved in the project regarding the research (e.g., for questions, information or concerns) you can contact the BMS ethics committee via:

committee-bms@utwente.nl.

Thank you for your participation!

I hereby declare that I read the information about this study. I know that the participation is voluntary, that data will be processed anonymously, and that I can withdraw from the study at any given moment. I understand that my answers will be used for research purposes only. I agree with the conditions and I consent to participate in the study.

B Questionnaires

B-1 Well-being - Mental Health Continuum Short Form (MHC-SF)

[WB-1] How often in the past month did you feel happy?

[WB-2] How often in the past month did you feel interested in life?

[WB-3] How often in the past month did you feel satisfied with your life?

[WB-4] How often during the past month did you feel that you had something important to contribute to society?

[WB-5] How often during the past month did you feel that you belonged to a community (like a social group, your neighbourhood, your city, your school)?

[WB-6] How often during the past month did you feel that our society is becoming a better place for people like you?

[WB-7] How often during the past month did you feel that people are basically good?

[WB-8] How often during the past month did you feel that the way our society works makes sense to you?

[WB-9] How often during the past month did you feel that you liked most parts of your personality?

[WB-10] How often during the past month did you feel good at managing the responsibilities of your daily life?

[WB-11] How often during the past month did you feel that you had warm and trusting relationships with others?

[WB-12] How often during the past month did you feel that you had experiences that challenged you to grow and become a better person?

[WB-13] How often during the past month did you feel confident to think or express your own ideas and opinions?

[WB-14] How often during the past month did you feel that your life has a sense of direction or meaning to it?

[6-point Likert scale, Never, Once or twice, About once a week, About 2 or 3 times a week, Almost every day, Every day]

B-2 Self-Regulation – Self-Regulation Questionnaire Short-Form (SSRQ)

[SR-1] I usually keep track of my progress towards my goals.

[SR-2} I have trouble making up my mind about things.

[SR-3] I get easily distracted from my plans.

[SR-4] I don't notice the effects of my actions until it is too late.

[SR-5] I am able to accomplish goals I set for myself.

[SR-6] I put off making decisions.

[SR-7] It's hard for me to notice when I've "had enough" (alcohol, food, sweets).

[SR-8] If I wanted to change, I am confident that I could do it.

[SR-9] When it comes to deciding about a change, I feel overwhelmed by the choices.

[SR-10] I have trouble following through with things once I've made up my mind to do something.

[SR-11] I don't seem to learn from my mistakes.

[SR-12] I can stick to a plan that's working well.

[SR-13] I usually only have to make a mistake one time in order to learn from it.

[SR-14] I have personal standards and try to live up to them.

[SR-15] As soon as I see a problem or challenge, I start looking for all possible solutions.

[SR-16] I have a hard time setting goals for myself.

[SR-17] I have a lot of willpower.

[SR-18] When I'm trying to change something, I pay a lot of attention to how I'm doing.

[SR-19] I have trouble making plans to help me reach my goals.

[SR-20] I am able to resist temptation.

[SR-21] I set goals for myself and keep track of my progress.

[SR-22] Most of the time I don't pay attention to what I'm doing.

[SR-23] I tend to keep doing the same thing, even when it doesn't work.

[SR-24] I can usually find several different possibilities when I want to change something.

[SR-25] Once I have a goal, I can usually plan how to reach it.

[SR-26] If I make a resolution to change something, I pay a lot of attention to how I'm doing.

[SR-27] Often I don't notice what I'm doing until someone calls it to my attention.

[SR-28] I usually think before I act.

[SR-29] I learn from my mistakes.

[SR-30] I know how I want to be.

[SR-31] I give up quickly.

[5-point Likert-Scale, Strongly Disagree, Disagree, I don´t know, Agree, Strongly Agree]

B-3 Neuroticism - Eysenck Personality Questionnaire-Revised Short Form – 12-Item Neuroticism Scale (EPQR-S)

[N-1] Does your mood often go up and down?

[N-2] Do you ever feel ‘just miserable’ for no reason?

[N-3] Are you an irritable person

[N-4] Are your feelings easily hurt?

[N-5] Do you often feel ‘fed-up’?

[N-6] Would you call yourself a nervous person?

[N-7] Are you a worrier?

[N-8] Would you call yourself tense or ‘highly strung’?

[N-9] Do you worry too long after an embarrassing experience?

[N-10] Do you suffer from ‘nerves’?

[N-11] Do you often feel lonely?

[N-12] Are you often troubled about feelings of guilt?

[‘yes’, ‘no’, ‘I don’t know’]