The Relation between the Use of Strengths and Psychological Well-being of University Students

Bachelor Thesis

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Abstract

Background: Mental health as a state of well-being is crucial for the optimal functioning of a person. Nevertheless, according to the World Health Organisation (2018), problems regarding mental health affect every fourth person worldwide. Especially University students suffer from conditions concerning their well-being, like periods of depressive mood, stress, anxiety and loneliness. Consequences of mental health problems in this early stage of life can impair academic and social functioning, as well as representing difficulties in identity development or even manifested psychological disorders such as major depression. As a promising means, Positive Psychology has proven to be particularly effective in prevention and treatment of those conditions by dealing with the strengths of individuals in order to improve the mental well-being.

Methods: The current study aims to unravel the relation between the use of strengths and the dimensions of psychological well-being. It was hypothesized that the psychological well-being dimension of *Engagement, Mastery* and *Autonomy* have a positive relationship with the use of strengths, whereas no relationship was expected between the dimensions *Meaning, Relationship* and *Optimism* and the use of strengths of university students. A sample of 172 University students filled out a combined questionnaire with the items of the VIA 120, the CIT and SUS.

Results: As a result, all dimensions indicate a relationship with strength use, solely the dimensions of *Relationship* and *Autonomy* do not have a significant relationship with the use of strengths.

Conclusion: By showing the relationships between the use of strengths and four dimensions of PWB, the current study offers important findings that might be useful to improve health care interventions among university students to help them cope with challenges concerning their well-being.

List of Contents

List of Tables

Introduction

Mental well-being

Nowadays, mental health can be regarded as a state of well-being which goes beyond the mere absence of mental illness. It emphasises an individual's ability to actualize one's own potential, to cope with stressful life events, to work efficaciously and to make contributions to one's own society (World Health Organisation, 2014). Therefore, mental health emphasises the optimal functioning of a person and this well-being is an important component in every phase of an individual's life.

Consequences of Mental Well-being Conditions

However, according to the World Health Organization (WHO) (2018), every fourth person worldwide will experience negatively influencing conditions concerning their mental health throughout their lifespan. Approximately 450 million individuals are affected by problems regarding mental or neurological health (WHO, 2018). The United States Department of Health and Human Service (2016) declared problems concerning mental health as a public health issue due to the prevalence throughout society. Mental health problems can manifest themselves in different ways. Affected persons may experience periods of sadness, stress, fear or loneliness which can have detrimental impacts on the normal functioning, including dysfunctional thoughts, emotions or behaviour (WHO, 2018).

Mental Well-being among University Students

As research in the field of mental well-being has shown, especially university students are affected by problems regarding mental health. A survey conducted with university students by Wadman, Webster, Mawn and Stain (2019) in the UK and Germany shows that up to 30 % of the sample suffered from mental health problems. Similar results were gathered by Vidourek and Burbage (2019), indicating that "Mental health problems are widespread among college students [..] with 60.9% feeling overwhelming anxiety, 39.3% of students reporting past-year depression […]" (Vidourek & Burbage, 2019, p.1). Accordingly, a study conducted among students in the US suggests that approximately 50% of the target group show signs of mental health issues (Macaskill, 2013). As reported by Macaskill (2013), the UK Royal College of Psychiatrists suggests an increase in numbers of students who suffer from conditions interfering with their mental health. Even more, periods of depression and anxiety serve as the most reported mental health issues among university students (Vidourek & Burbage, 2019).

Consequences of mental health problems among university students are college dropouts, reduced academic functioning or low academic achievement (Bruffaerts et al., 2018).

Besides consequences regarding the academic achievement of students, mental well-being problems also include periods of depressive mood, stress and anxiety (Wadman et al. 2019). Bruffaearts and colleagues (2018) investigated that these problems are starting during the college years and can lead to more severe mental disorders, such as major depression or anxiety disorders later in life. This is partly due to the assumption that mental health disorders are likely to become apparent and manifest during late adolescence (Wadman et al., 2019). According to Villacura et al. (2015), mental health problems also have a negative impact on the identity development of a person, which can lead to abnormal behaviour, impaired social functioning and impaired well-being.

Prevention and Treatment Options

In order to prevent and treat mental health problems, different therapeutic approaches aim to counteract their causes and consequences. The most prominent method, widely known as the traditional psychological approach, focuses on the dysfunction or psychological illness of individuals (Govindji & Linley, 2007; Wood, Linley, Maltby, Kahdan, & Hurling, 2011). The intention behind focussing on dysfunctions is to be able to formulate diagnoses and provide individuals with a tailored treatment to overcome illness and achieve a normal functioning (Protcor, Maltby, & Linley, 2010). This approach was established decades ago and has proven to be useful, especially in terms of treating severe mental illness such as schizophrenia (Gable & Haidt, 2005).

Since the traditional approach has proven to be particularly effective for the treatment of *severe* mental disorders, it is necessary to introduce a further approach which has successfully established itself for the treatment of *initial* mental health related problems, called positive psychology. It has become a promising alternative to traditional treatment within the last years because the approach focuses on the strengths of a person rather than pathology. Besides the focus on strengths, positive psychology deals with different dimensions of well-being such as meaning or purpose in life, engagement and mastery which serve as means to prevent initial mental health problems and enhance the mental well-being (Sin & Lyubomirsky, 2009). Due to the success of dealing with strengths and different factors of well-being in the field of positive psychology, the aim of this study is to provide better understanding of how an interplay between those principles might contribute to the well-being of university students. Knowledge about the possible relationships will help to develop more efficient treatment programs of such conditions in order to avoid the development of severe mental illnesses among university students. Therefore, the research question of this study is

Is there a relationship between the use of strengths and the dimensions of psychological well-being of University students?

In order to clarify the necessity of dealing with strengths and the dimensions of well-being, information about those factors are provided.

Positive Psychology

The focus of positive psychology goes beyond overcoming impairment but aims to reach optimal well-being (Diener, Su & Tay, 2014). Especially in terms of the prevention of impairments of mental well-being and the treatment of mental health problems, such as depressive mood, positive psychology serves as successful therapy (Gable & Haidt, 2005). This is due to the success of dealing with the strengths, possibilities and talents of an individual instead of focusing on pathology. With this approach, positive psychology aims to achieve flourishing and optimal functioning of a person (Peterson & Seligman, 2004; Gable & Haidt, 2005).

According to Park, Peterson and Seligman (2004) positive traits which are reflected in thoughts, feelings and behaviours of individuals can be referred to as character strengths. Additionally, strengths can be described as a kind of innate talent an individual can intuitively make use of (Park et al., 2004). Inferring from this definition, each person has multiple strengths which are expressed through the thoughts, feelings and behaviours of individuals and are helpful in order to achieve goals and sustain well-being (Clifton & Anderson, 2002; Peterson & Seligman, 2004). Moreover, as previous research has shown, positive behaviours, such as executing one's own strengths, facilitates the psychological well-being of individuals (Huppert, 2009). Since positive Psychology is effective in terms of preventing and treating initial mental well-being problems, it is directly applicable to the target group of university students that develop or experience negative effects to mental health.

Mental Well-being: Different Dimensions

Besides the use of strengths, also the different dimensions of well-being are beneficial to maintain a positive mental health (Sin & Lyubomirsky, 2009). A person's well-being can be divided into different constructs, the subjective well-being (SWB) and the psychological well-being (PWB) (Diener et al., 2014).

SWB entails three distinctive dimensions, namely, *life satisfaction* as the cognitive part and *positive affect*, and *negative affect* as the emotional part (Lucas, Diener, & Suh, 1996). Since the positive effect of SWB for the overall mental well-being and the relation to strengths

has already been investigated by different studies, the current study focusses on the construct PWB (Protcor, Maltby, & Linley, 2011, Park et al., 2004). PWB can be divided into six different dimensions: *Relationship, Engagement, Mastery, Autonomy, Meaning* and *Optimism* (Diener et al., 2014). The dimension *"Relationship"* focuses mainly on interpersonal relationships, while the dimension *"Engagement"* deals with the individual's behaviour during activities. *"Mastery"* entails skills, learning, accomplishments, self-efficacy and self-worth. The dimension of *"Autonomy"* deals with life-choices an individual makes and the dimension *"Meaning"* concerns living a meaningful life with a purpose. Lastly, *"Optimism"* focuses on the perspectives of an individual's life (Diener et al., 2014). According to Diener and Chan (2011), high levels of the dimensions of PWB have a positive impact on health outcomes such as longevity and physical health of a person. Individuals who report high levels of the PWB dimensions tend to successfully cope with stressful events (Diener & Chan, 2011). Moreover, decreased levels of the dimensions of PWB are assumed to cause conditions to the overall mental well-being such as depression or anxiety (Liu, Shono, & Kitamura, 2009). A lack of the dimensions of *"Mastery", "Relationship"* and *"Optimism"* accounts for depression, whereas low levels of *"Autonomy"* and *"Engagement"* induce periods of anxiety (Liu et al., 2009).

The Interplay of Strengths and PWB

Previous research has shown an association between possessing knowledge of one's own strengths and high mental well-being, using a community sample (Wood et al., 2011; Park et al., 2004). Moreover, also the relation between mental well-being and specific character-strengths, as well as the possessed level of strengths have been investigated intensively (Wood et al., 2011). However, according to Wood et al. (2011), almost no studies have investigated the relationship between the use of strengths and the dimensions of PWB so far. Moreover, it is noticeable that studies which observed the relation between using strengths and well-being did rarely focus on University students (Diener & Chan, 2011).

A study which has actually gone in that direction was conducted by Govindji and Linley (2007). They found that the association between the overall PWB of a sample of University students and the use of strengths was significant. However, the research did not distinctively investigate the six different constructs of psychological well-being but simply summarized it as "engagement with the existential challenges of life" (Govindji & Linley, 2007, p.145). Based on the findings of the study, Proctor, Maltby and Linley (2011) measured the association between generic use of strengths, subjective well-being and self-efficacy of University students, again, omitting the discrete constructs of PWB.

The importance of the different dimensions of the PWB was, however, partially investigated by Govindji and Linley (2007), who found that the use of strengths enhances especially the dimension of *Engagement,* leading to a generally higher mental health. This also applies to the PWB dimension *Mastery* since the use of strengths is considered to correlate significantly with self-efficacy, a subscale of the respective dimension (Govindji & Linley, 2007; Diener et al., 2014). Moreover, using one's own strengths is thought of as an enhancement to the PWB dimension of *Autonomy* (Linley, Nielsen, Gillet, & Biwas-Diener, 2010). Regarding the dimension *Meaning*, no association to the use of strengths has been studied yet (Linley et al., 2010). Nevertheless, further research for this particular dimension was recommended by Linley et al. (2010) due to an expected beneficial impact of the overall PWB. This is also applicable to the remaining dimensions of *Relationship* and *Optimism*. In order to answer the research question and investigate the relationships between the dimensions of PWB and the strength use of university students, six hypotheses are proposed based on the literature of the previous studies:

H1: There is a positive relationship between the use of strengths and the PWB dimension Engagement of university students.

H2: There is a positive relationship between the use of strengths and the PWB dimension Mastery of university students.

H3: There is a positive relationship between the use of strengths and the PWB dimension Autonomy of university students.

H4: There is no relationship between the use of strengths and the PWB dimension Meaning of university students.

H5: There is no relationship between the use of strengths and the PWB dimension Relationship of university students.

H6: There is no relationship between the use of strengths and the PWB dimension Optimism of university students.

Methods

Participants

This study involved 188 participants in total, from which 15 were excluded from the analysis since the respondents did not answer the questionnaire completely. Outliers were determined based on extreme values and excluded from the sample. Based on that, one participant was

deleted and the sample decreased to N= 172 University students. The age ranges from 18-28 years (*M*age= 21.2, *SD*age= 1.8). A convenience sampling method was applied due to the inclusion criteria of (1) a sufficient English level of the participant, (2) a minimum age of 18 years and (3) the participants had to follow an educational program at a University. The study was approved by the Behavioural, Management and Social Science ethics committee of the University of Twente. The demographics of the participants are depicted in Table 1.

Table 1

Demographics of Participants

Variable	*n*	%
Gender		
Male	30	17.4
Female	142	82.6

Materials

This particular study was part of a shared research project with the main focus on the constructs of well-being and strengths of University students. In particular, the constructs of PWB, SWB and self-esteem were investigated within the joint research and data collection. The focus of this particular study was to deal with the different dimensions of PWB and the relation to the use of strengths of University students.

In the interest of answering the research question, all participants were asked to fill out four consecutive tests that have been combined into one final questionnaire at the online platform Qualtrics. The final questionnaire consisted of the items of the Values in Action Inventory of Strengths (VIA), the Strength Use Scale (SUS), the Comprehensive Inventory of Thriving (CIT) and the Rosenberg Self-Esteem Scale. Due to the nature of joint research, only the materials applicable for the purpose of this particular study are presented and evaluated. This study concerned the first three parts of the combined questionnaire, leaving out the Rosenberg Self-Esteem scale.

The VIA. First of all, the questionnaire regarded the items of the VIA, in order to enable the participants to become aware of their own strengths. The VIA was created in 2004 and is a self-assessment online test which supplies information about the strengths and core characteristics an individual possesses (Peterson & Seligman, 2004; Diamond, O'Brien-Malone, & Woodworth, 2010). The survey consists of 120 items provided with a 5-point Likert-scale ranging from 1 = "*very much unlike me*" to 5 ="*very much like me*" and evaluates 24

strengths of a person. An example item of the questionnaire is "Being able to come up with new and different ideas is one of my strong points" (VIA Institute on Characters, 2004). Regarding the psychometric properties, the test showed average internal consistency reliability of .79, which could be labelled as very good (VIA Institute on Character, n.d.). However, for this research, the VIA served solely as a mean for participants to form a first impression of their own strengths and the results are not statistically investigated later on in this study.

   The SUS. Subsequently, the questionnaire presented the items of the SUS. The SUS was invented by Govindji and Linley in 2007 and is intended to measure the use of strengths of an individual. Originally, it consists of 14 items provided with a 7-point-Likert-scale ranging from 1 = "*Strongly disagree*" to 7 = "*Strongly agree*". One example for the items of the SUS is "I am regularly able to do what I do best" (Govindji & Linley, 2007). According to Wood et al. (2011), the psychometric properties of the scale show high internal consistency (α= .94) of the items, as well as high test-retest reliability (r = .84). However, this study made use of a 5-point Likert scale ranging from 1 = *"Agree"* to 5 = *"Disagree"*, in order to generate coherence throughout the combined questionnaire. To justify the use of a 5-point Likert-scale, a reliability analysis was performed and Cronbach's alpha computed. The alpha coefficient for the 14 items is .90, indicating an excellent internal consistency (Mallery & George, 2010).

   The CIT. After answering the items of the SUS, the participants were asked to respond to the items of the CIT, created by Diener et al. (2014). The CIT consists of 7 scales with 18 subscales and 54 items and measures the well-being of individuals on the different levels of PWB and SWB (Diener et al., 2014). Since this study examines in how far the use of strengths of University students relates to the dimensions of PWB, only the items that cover these dimensions were investigated. These items belong to the first six scales of *Relationship, Engagement, Mastery, Autonomy, Meaning* and *Optimism* (Diener et al., 2014). All items are provided with a 5-point-Likert-scale ranging from "*Strongly disagree*" to "*Strongly agree*". An example question is "My life has a clear sense of purpose." (Diener et al., 2014). According to Diener et al. (2014) the test showed a good test-retest reliability for all subscales of psychological well-being ranging from .57 to .83. Moreover, the test had good internal consistency with α = .71 (Diener et al., 2014). The final questionnaire can be found in Appendix A.

Design and Procedure

This study used a correlational online survey design. A questionnaire, including the items of the four distinctive tests VIA, SUS, CIT and the Rosenberg Self-Esteem Scale was developed, using the online platform Qualtrics. The test was then presented on the platform Qualtrics,

enabling persons that were provided with a link via mail to participate with all web-enabled devices. Additionally, the questionnaire was uploaded to another online platform called SONA, to which students following an educational program at the University of Twente had access.

Before the participants were able to fill out the questionnaire, an information text about the terms of the study was presented to them. It entailed information about the purpose of the study, the approximate time required to fill out the questionnaire, the collection of data, the analysis of the data and the confidentiality in dealing with individual data as well as the contact information of the researchers. Additionally, the participants were informed about the possibility to quit at any time without giving any reasons. Subsequently, an informed consent was presented and the participants were asked to either agree on the terms of the study by ticking a box stating "*I agree*" or to withdraw by ticking a box stating "*I disagree*" (see Appendix A). Participants that gave their consent indicated to have read the conditions of the study and to voluntarily take part.

The online questionnaire was then answered by the participants within a time frame of 30-45 minutes. In order to answer a question, boxes entailing the possible answer options of the 5-point Likert scale were presented below every item. Each participant then had to decide for one of the answer options by ticking the respective box. At the end of the online questionnaire, contact details of the researcher were given in order to answer remaining questions or to be informed of the results of the study afterwards. Furthermore, the respondents were thanked and a confirmation that the answers were saved was given.

Data Analysis

The data of participants that did not answer the questionnaire completely were excluded from the analysis. Another exclusion criterion was answering the questions with a certain answer pattern, such as the permanent ticking of the Likert scale with value 1. Since the questionnaires also contain reversed items, it could be determined who followed this pattern and then participants with this type of answers were excluded. Furthermore, outliers were detected based on extreme values and, as well, excluded from the sample. Additionally, irrelevant data gathered due to the condition of joint research were excluded for the analysis of this particular study.

The data retrieved from the questionnaire was analysed with SPSS 25.0 for statistical analyses. As a first step, the reliability was investigated by Cronbach's Alpha. Subsequently, descriptive statistics and the means of the items were calculated and analysed. Regarding the skewness, a cut-off score between -2 and 2 was set (Mallery & George, 2010). The research

question *"Is there a relationship between the use of strengths and the dimensions of PWB of university students?"* contained the six distinctive dimensions of PWB of university students as variables and the use of strengths as a second variable. In order to test the relationship between the use of strengths and the dimensions of PWB of university students, Pearson's product-moment correlation coefficient was computed.

Subsequently, the six hypotheses were investigated by correlating the total score of the Strength Use with the six distinctive PWB dimensions of *Mastery, Autonomy, Engagement, Relationship, Optimism* and *Meaning*. In order to investigate the strength and direction of the correlation, effect-sizes for a very weak correlation ($r = .00-.19$), a weak correlation ($r = .20-.39$), a moderate correlation ($r = .40-.59$), a strong correlation ($r = .60-.79$) and a very strong correlation ($r = .80-1.0$) were determined (Evans, 1996). The direction of the correlation was determined to either a negative linear correlation ($r < 0$), indicating a decreasing relationship, no relationship ($r = 0$) or a positive linear correlation ($r > 0$), indicating an increasing relationship (Kent State University, 2019).

Results

Descriptive statistics

The descriptive statistics for all variables are listed in Table 2. The data is normally distributed with skewness between the cut-off values of -2 and 2 (Mallery & George, 2010). For all variables, the mean lies in the lower half of the possible score range. The mean of *Autonomy* ($M(172) = 5.6$, $SD = 2.3$) was the lowest in comparison to the other variables. The highest mean was obtained for the variable *Relationship* ($M(168) = 45.0$, $SD = 6.7$).

Table 2

Descriptives of Strength Use and the PWB Dimensions

Variable	*n*	*M*	*SD*	Range Actual	Range Potential	Skew
Strength Use	170	28.9	7.7	14-60	14-70	.31
Autonomy	172	5.6	2.3	3-14	3-15	1.13
Relationship	168	45.0	6.7	26-70	18-90	.25

Mastery	169	33.4	7.4	15-66	15-75	.77
Engagement	172	6.8	2.0	3-15	3-15	.90
Meaning	172	7.2	2.6	3-15	3-15	.80
Optimism	171	6.4	2.5	3-15	3-15	1.12

Correlational Analysis

The correlations of all variables are displayed in Table 3. The correlation of the dimension *Engagement* and Strength Use has shown a significant positive direction with a moderate strength (r (170) = .49, $p<.01$). Hence, the first hypothesis *H1* can be accepted. For the second hypothesis, the correlation of Strength Use and the dimension *Mastery* was investigated. The results indicated a significant positive relationship with a strong magnitude and *H2* can be accepted (r (167) =.74, $p< .01$). For the dimension of *Autonomy*, no statistically significant linear relationship with Strength Use was found (r (170) =.19, $p> .05$). Based on these results, *H3* cannot be accepted.

A significant positive correlation between the dimension *Meaning* and Strength Use with a moderate magnitude was found (r (170) = .54, $p< .01$). Therefore, *H4* cannot be accepted. For the dimension *Relationship* no significant linear correlation with Strength Use was investigated (r (166) =.19, $p> .05$). As indicated by the results, *H5* can be accepted. Concerning the subscale *Optimism*, a significant positive correlation with the use of strengths was calculated with a moderate strength (r (169) = .45, $p < .01$). Based on that, *H6* cannot be accepted.

Table 3

Correlations of the Strength Use and the Dimensions of PWB

		Engagement	Mastery	Autonomy	Meaning	Relationship	Optimism
Strength Use	Pearson's R	.49**	.74**	.19	.54**	.19	.45**
	Sig. (2-tailed)	.00	.00	.11	.00	.01	.00
	N	170	167	170	170	166	169

*p < .05. **p < .01.

Discussion

Due to the negative impact of experiencing mental well-being problems and the presumed beneficial effects of the interplay between the six dimensions of PWB and Strength Use, the aim of the current study was to investigate the relationship between the use of strengths and the dimensions of PWB of University students. It was expected that a positive relationship between the dimensions *Engagement, Mastery* and *Autonomy* and Strength use of university students can be found, whereas no relationship between Strength use and the dimensions *Meaning, Relationship* and *Optimism* was assumed.

Based on the results, it can be concluded that an association between Strength Use and four dimensions of PWB, namely, *Engagement, Mastery, Meaning* and *Optimism*, is given. A positive relationship of the dimension *Engagement* and the Strengths Use of University students was assumed and could be confirmed. The relation between the two constructs indicates that an increased Strength Use relates to an increased level of *Engagement*. This is consistent with Govindji and Linley's (2007) previous assumptions that strength use is considered to be essential for enriching the PWB dimension *Engagement* and therefore, mental well-being. Reflecting on these results, it can be concluded that university student's mental well-being can be enhanced through an interplay between using their strengths and being equipped with the dimension of *Engagement*. Furthermore, this connection can be beneficial for counteracting the university student's initial mental health problems, as a previous study conducted by Liu et al. (2009) identified a high level of the PWB dimension *Engagement* to counteract periods of anxiety.

Secondly, a positive connection between the dimension *Mastery* and the strength use of university students was expected and can be confirmed by the gathered results. This reflects the assumptions of previous studies, which suggested a clear connection between the use of strengths and self-efficacy, a component of the dimension *Mastery* (Govindji & Linley, 2007; Diener et al., 2014). Hence, university students that display an increased level of strength use also have an increased level of the dimension *Mastery* and therefore, also experience self-worth, self-efficacy and learning-accomplishments. This can be beneficial for counteracting the challenges students face, such as reduced academic functioning.

The expected positive relationship between the strength use and the dimension *Autonomy* of university students was not found. This means that even though a student may use his or her own strengths, it has no effect on the PWB dimension of *Autonomy* or vice versa. These findings are contrary to the results of previous research since Linley et al. (2010) found

strength use to be associated with *Autonomy*, leading to a higher life-satisfaction and promote mental well-being. A possible explanation for the findings could be that the development of *Autonomy* is influenced by different aspects than strength use as, for instance, it might develop by students moving out and managing their life on their own (Allen & Loeb, 2015).

The use of strengths was assumed to have no relationship with the dimension *Meaning* of university students. Nevertheless, the dimension *Meaning* showed a positive association with Strength Use of university students. As Linley et al. (2010) indicated, no previous studies have been able to identify a relationship between the two variables. The positive effect of having a meaningful purpose in life was already confirmed to be enriching for a positive mental well-being by Halama and Endova (2007), however, the variable of Strength Use was not taken into account. The current study was able to hint at this relationship and therefore, it can be concluded that experiencing meaning or purpose in life paired with strength use can possibly benefit the overall psychological well-being and hence, the mental health of university students.

No relationship has been assumed between the use of strengths and the dimension *Relationship* of University students which holds for true based on the findings of this study. Also, previous studies did not identify a relationship between the variables (Linley et al., 2010). Nevertheless, the dimension of *Relationship* was investigated to positively influence the mental well-being of (late) adolescents, the phase which many university students face (Allen & Loeb, 2015). In a study conducted by Allen and Loeb (2015), it has been found that adolescents state to experience the greatest happiness while interacting with their peers. However, especially adolescents and young adults are confronted with the challenge to maintain a balance between acting autonomously and uphold social relationships (Allen & Loeb, 2015). A part of the participants of the current study faces this stage of development, which could explain why no link between strength use and the dimension *Relationship* could have been found, since *Relationship* can be seen not only as part of PWB but also as a challenge. Therefore, the beneficial consequences of a relationship between both variables could exist, but have not been confirmed by means of this study.

For the dimension *Optimism*, a positive association with the use of strengths was found which is contrary to the expectations. However, the current study confirmed an association between the construct, leading to the conclusion that the student's mental well-being benefits from the interplay. Diener and Chan (2011) investigated that the dimensions of *Optimism* enhances the engagement in health-oriented behaviour and functioning positively. Therefore, *Optimism* can possibly enrich the mental well-being of University students without a relation to Strength use also. Moreover, Diener and Chan (2011) indicated that *Meaning* and *Optimism*

14

are intercorrelated and therefore, no distinct constructs. This can be an explanation for the findings of the current study, since the dimension *Meaning* also shows a relationship with strength use (Diener & Chan, 2011).

Despite the fact that the hypotheses of could not be fully accepted, the findings of the current study still contribute to the aim to investigate relationships of principles of positive psychology in order to formulate new treatment options for university students who experience initial mental health problems such as depressive episodes.

Strong Points, Limitations and Recommendations

The current study holds both strong points and limitations. Based on that, recommendations and practical implications for further research are made. The application and integration of already established tests into one questionnaire is a strong point of the study, since the VIA, SUS and CIT are proven as reliable and valid measurements. Furthermore, this study was the first to integrate these tests into one final questionnaire, which made it possible to determine the relationships of dimensions and strength of students.

Another strong point is that the current study was able to unravel a positive, significant relationship between four out of six PWB dimensions and the use of strengths of university students, even though it was hypothesized differently. Since previous studies did not determine a relationship, these findings gave new insights into both, the dimensions of PWB and use of strengths. Nevertheless, due to contrary findings to previous research, it is recommendable to replicate this study and clarify possible reasons for this. Furthermore, this study points out the usefulness of being aware of own strengths and the necessity to make use of them in order to enhance one's own well-being. This is an important insight for further research in the field of possible treatment options or to improve health care interventions among university students to help them cope with both, challenges in their study and mental well-being problems. However, since this study made use of a correlational analysis, it is recommendable to apply different statistical methods to investigate the causality of the relationship, which cannot be measured by means of Pearson's R. Due to other statistical methods, it will be possible to determine whether one variable might influence the other, such as an increased use of strengths causes an increased level of a PWB dimension among university students.

One limitation this study faces concerns the generalizability of the results is questionable due to the homogeneity of the sample. The high rate of female participants in this study underrepresents male students and the application of the results to the entire population 'university students' cannot be generated. Additionally, the questionnaire was available only for

students of the University of Twente who follow an educational program in the faculty of Behavioural, Management and Social Sciences. Hence, students of different faculties did not have the possibility to participate and possible different attitudes towards strength use and mental well-being were neglected in this study. Based on the limited generalizability of the results, it is recommended to replicate the study with a heterogeneous sample and the questionnaire should then also be accessible to students of any faculty to promote an equal chance to participate for all members of the population.

Another weak point of the study concerns the application of the VIA. The participants were asked to fill in four consecutive tests, starting with the VIA to form an impression of own strengths. However, in order to comprehend one's own strengths, the results of the VIA should have been evaluated and presented to the participants before answering the items of the SUS and CIT. Since this study did not provide the participants with the results of the VIA, it is questionable whether the participants were aware of their strengths before answering questions regarding their use of them. Therefore, it is recommendable to replicate the study to provide the participants with information regarding their strengths and then afterwards test their strengths use and psychological well-being.

This study also indicated that the dimensions of *Autonomy* and *Relationship* do not have a relationship with the use of strengths of university students but possibly influence each other, therefore, it is recommended to further investigate this topic.

Conclusion

At the present day, many individuals are affected by mental health problems. Especially young members of the society such as University students suffer from anxiety, depressive mood or dysfunctional thoughts and behaviour. However, the current study has shown that persons who have knowledge about their own strengths and increasingly make use of them also have an increased level of PWB dimensions. These relationships serve the overall mental well-being of university students and help them to cope with challenges they encounter in their lives and studies. Moreover, the findings give rise to new insights for possible interventions, treatment and prevention of mental well-being problems among university students. Therefore, further research in the field of strengths and well-being is crucial in order to understand the discovered relationships, find ideas for treatment and to be able to offer support and help individuals finding their own way to flourish.

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Appendix A

Informed Consent

Dear Participant,

You are invited to participate in a research study about the relationship between character strengths and mental well-being, compromised by subjective well-being, positive functioning and the level of self-esteem. This study is conducted by Melanie Pieper, Isabel Foltynski and Stefanie Klimow from the Faculty of Behavioural Management and Social Sciences at the University of Twente.

You will receive various questionnaires that will take about 20 minutes to fill out. Your participation in this survey is completely voluntary and all of your responses are anonymous. None of the responses will be connected to identifying information. Data will only be used for statistical analyses. Your answers will remain confidential. As your participation in this study is entirely voluntary and you can withdraw at any time.

If you have questions about your rights as a research participant or wish to obtain more information about this study, you are free to contact the researchers via the following emails: m.pieper@student.utwente.nl,i.foltynski@student.utwente.nl and s.klimow@student.utwente.nl.

By clicking "I agree", you indicate that you have read the description of the study, are over the age of 18, and that you agree with the terms as described.

Appendix B
VIA

1. Being able to come up with new and different ideas is one of my strong points,
2. I have taken frequent stands in the face of strong opposition.
3. I never quit a task before it is done.
4. I always keep my promises.
5. I have no trouble eating healthy foods.
6. I always look on the bright side.
7. I am a spiritual person
8. I know how to handle myself in different social situations
9. I always finish what I start
10. I really enjoy doing small favors for friends
11. There are people in my life who care as much about my feelings and well-being as they do about their own.
12. As a leader, I treat everyone equally well regardless of his or her experience.
13. Even when candy or cookies are under my nose, I never overeat.
14. I practice my religion.
15. I rarely hold a grudge.
16. I am always busy with something interesting.
17. I am thrilled when I learn something new.
18. I like to think of new ways to do things.
19. No matter what the situation, I am able to fit in.
20. I never hesitate to publicly express an unpopular opinion.
21. I believe honesty is the basis for trust.
22. I go out of my way to cheer up people who appear down.
23. I treat all people equally regardless of who they might be.
24. One of my strengths is helping a group of people work well together even when they have their differences.
25. I am a highly disciplined person.
26. I always think before I speak.
27. I experience deep emotions when I see beautiful things.
28. At least once a day, I stop and count my blessings.
29. Despite challenges, I always remain hopeful about the future.
30. My faith never deserts me during hard times.
31. I do not act as if I am a special person.
32. I welcome the opportunity to brighten someone else's day with laughter.
33. I never seek vengeance.
34. I value my ability to think critically.
35. I have the ability to make other people feel interesting.
36. I must stand up for what I believe even if there are negative results.
37. I finish things despite obstacles in the way.
38. I love to make other people happy.
39. I am the most important person in someone else's life.

40. I work at my very best when I am a group member.
41. Everyone's rights are equally important to me.
42. I see beauty that other people pass by without noticing.
43. I have a clear picture in my mind about what I want to happen in the future.
44. I never brag about my accomplishments.
45. I try to have fun in all kinds of situations.
46. I love what I do.
47. I am excited by many different activities.
48. I am a true life-long learner.
49. I am always coming up with new ways to do things.
50. People describe me as "wise beyond my years."
51. My promises can be trusted.
52. I give everyone a chance.
53. To be an effective leader, I treat everyone the same.
54. I never want things that are bad for me in the long run, even if they make me feel good in the short run.
55. I have often been left speechless by the beauty depicted in a movie
56. I am an extremely grateful person.
57. I try to add some humor to whatever I do.
58. I look forward to each new day.
59. I believe it is best to forgive and forget.
60. I have many interests.
61. When the topic calls for it, I can be a highly rational thinker.
62. My friends say that I have lots of new and different ideas.
63. I am always able to look at things and see the big picture.
64. I always stand up for my beliefs.
65. I do not give up.
66. I am true to my own values.
67. I always feel the presence of love in my life.
68. I can always stay on a diet.
69. I think through the consequences every time before I act.
70. I am always aware of the natural beauty in the environment.
71. My faith makes me who I am.
72. I have lots of energy.
73. I can find something of interest in any situation
74. I read all of the time.
75. Thinking things through is part of who I am.
76. I am an original thinker.
77. I am good at sensing what other people are feeling.
78. I have a mature view on life.
79. I am as excited about the good fortune of others as I am about my own.
80. I can express love to someone else.
81. Without exception, I support my teammates or fellow group members.
82. My friends always tell me I am a strong but fair leader.
83. I always keep straight right from wrong.
84. I feel thankful for what I have received in life.
85. I know that I will succeed with the goals I set for myself.
86. I rarely call attention to myself.
87. I have a great sense of humor.
88. I rarely try to get even.

89. I always weigh the pro's and con's.
90. I stick with whatever I decide to do.
91. I enjoy being kind to others.
92. I can accept love from others.
93. Even if I disagree with them, I always respect the leaders of my group.
94. Even if I do not like someone, I treat him or her fairly.
95. As a leader, I try to make all group members happy.
96. I am a very careful person.
97. I am in awe of simple things in life that others might take for granted.
98. When I look at my life, I find many things to be grateful for.
99. I have been told that modesty is one of my most notable characteristics.
100. I am usually willing to give someone another chance.
101. I think my life is extremely interesting.
102. I read a huge variety of books.
103. I try to have good reasons for my important decisions.
104. I always know what to say to make people feel good.
105. I may not say it to others, but I consider myself to be a wise person.
106. It is important to me to respect decisions made by my group.
107. I always make careful choices.
108. I feel a profound sense of appreciation every day.
109. If I feel down, I always think about what is good in my life.
110. My beliefs make my life important.
111. I awaken with a sense of excitement about the day's possibilities.
112. I love to read nonfiction books for fun.
113. Others consider me to be a wise person.
114. I am a brave person.
115. Others trust me to keep their secrets.
116. I gladly sacrifice my self-interest for the benefit of the group I am in.
117. I believe that it is worth listening to everyone's opinions.
118. People are drawn to me because I am humble.
119. I am known for my good sense of humor.
120. People describe me as full of zest.

CIT

1. There are people I can depend on to help me.
2. There are people who give me support and encouragement.
3. There are people who appreciate me as a person.
4. I pitch in to help when my local community needs something done.
5. I invite my neighbors to my home.
6. I look for ways to help my neighbors when they are in need.
7. I can trust people in my society.
8. People in my neighborhood can be trusted.
9. Most people I meet are honest.
10. People respect me.
11. People are polite to me.
12. I am treated with the same amount of respect as others.
13. I feel lonely.
14. I often feel left out.

15. There is no one I feel close to.
16. I feel a sense of belonging in my community.
17. I feel a sense of belonging in my state or province.
18. I feel a sense of belonging in my country.
19. I get fully absorbed in activities I do.
20. In most activities I do, I feel energized.
21. I get excited when I work on something.
22. I use my skills a lot in my everyday life.
23. I frequently use my talents.
24. I get to do what I am good at everyday.
25. I learned something new yesterday.
26. Learning new things is important to me.
27. I always learn something everyday.
28. I am achieving most of my goals.
29. I am fulfilling my ambitions.
30. I am on track to reach my dreams.
31. I am confident that I can deal with unexpected events.
32. I can succeed if I put my mind to it.
33. I believe that I am capable in most things.
34. What I do in life is valuable and worthwhile.
35. The things I do contribute to society.
36. The work I do is important for other people.
37. Other people decide most of my life decisions.
38. The life choices I make are not really mine.
39. Other people decide what I can and cannot do.
40. My life has a clear sense of purpose.
41. I have found a satisfactory meaning in life.
42. I know what gives meaning to my life.
43. I am optimistic about my future.
44. I have a positive outlook on life.
45. I expect more good things in my life than bad.
46. In most ways my life is close to my ideal.
47. I am satisfied with my life.
48. My life is going well.
49. I feel positive most of the time.
50. I feel happy most of the time.
51. I feel good most of the time.
52. I feel negative most of the time.
53. I experience unhappy feelings most of the time.
54. I feel bad most of the time.

SUS

1. I am regularly able to do what I do best

2. I always play to my strengths

3. I always try to use my strengths

4. I achieve what I want by using my strengths

5. I use my strengths everyday

6. I use my strengths to get what I want out of life

7. My work gives me lots of opportunities to use my strengths

8. My life presents me with lots of different ways to use my strengths

9. Using my strengths comes naturally to me

10. I find it easy to use my strengths in the things I do

11. I am able to use my strengths in lots of different situations

12. Most of my time is spent doing the things that I am good at doing

13. Using my strengths is something I am familiar with

14. I am able to use my strengths in lots of different ways