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The mediating role of Coping Self-efficacy on the relationship between Strengths use and Well-being among Higher education Students

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Abstract

The mental health and well-being of higher education students is of concern to academics and psychologists worldwide due to the impact on student learning and academic attainment. In particular, academic-related stresses have been found to be indicative of lower well-being in higher education students. An essential factor in coping with academic-related stresses is the students' coping self-efficacy, that is their confidence in the ability to cope with stresses. Previous research has led to the expectation that strengths use is in relation to both coping self-efficacy and well-being. Furthermore, coping self-efficacy is expected to predict well-being, upon which, the current study hypothesised that coping self-efficacy mediates the relationship between strengths use and well-being among higher education students. Using the online platform Qualtrics, a survey was devised based on the three constructs of strengths use, coping self-efficacy and well-being. A convenience sample of higher education students was recruited (N = 88) and a mediation analysis was performed. The results revealed positive and significant relations between strengths use and well-being, strengths use and coping self-efficacy and coping self-efficacy and well-being. Furthermore, in line with the expectations prior to the study, results showed that coping self-efficacy mediated the relationship between strengths use and well-being among higher education students. Results were in line with literature that has explored the impact of coping self-efficacy on well-being and has substantiated these relations for higher education students. The results attribute to previous research on strengths use as well as being the first as of current knowledge to have explored the impact of coping self-efficacy in relation to strengths use and well-being among higher education students. Findings of the study have stressed the importance of enabling students to use their strengths in order to strengthen their coping self-efficacy and in turn their well-being. The obtained knowledge should be embedded into current and newly designed strengths-based interventions to ensure well-being of students in the academic setting.

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Introduction

Mental health is an essential prerequisite for quality of life, performance and social interaction. We require stable mental health in order to flourish as individuals as well as interact within our community (World Health Organisation, 2019). The WHO has defined mental health as "a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community" ("Mental health: strengthening our response," 2018). In the past, psychology has often focused on negative mental health (i.e. illness and distress) (Horwitz & Scheid, 1999), whilst neglecting the fulfilled and thriving community (Seligman & Csikszentmihalyi, 2014). With the rise of positive psychology, the importance of protecting and promoting the mental health and well-being of all people has been recognised (Seligman & Csikszentmihalyi, 2014). In particular, the health of higher education students has become an internationally recognised public health issue (Stallman, 2010; Bonell et al., 2014). In 2017, the *Chronical of Higher Education* survey has listed student mental health as their number one concern (Rubley, 2017). Students have been identified as an "at risk" population, because the typical age at which most young adults enter higher education coincides with the age at which many mental disorders manifest themselves (Kessler et al., 2005). Whilst young adults are known to be vulnerable to mental health issues, students have reported higher rates of mental health problems than their non-student peers (Keyes et al., 2012).

One concern of academics and psychologists worldwide is the impact of mental health on students' academic performance. Studies have found students' energy level, concentration, dependability and optimism to be significantly affected by the state of their mental health (Eisenberg, Downs, & Golberstein, 2009). Furthermore, the American College Health Association has shown that stress (30%), anxiety (22%), sleep difficulties (20%) and depression (14%) are the most common mental health issues impacting their academic performance (American College Health Association, 2015). Similarly, the well-being of students has a direct influence on the learning and academic engagement of students (Noble, Wyatt, McGrath, Roffey, & Rowling, 2008). Studies show an existing synergistic relationship between health and well-being and academic attainment. Those who are well educated have an improved well-being and those with greater well-being have a higher academic attainment (Bonell et al., 2014). This suggests the importance of academic performance to achieve as well as ensure well-being in students.

Coping Self-efficacy and Well-being

In regard to the importance of academic attainment within higher education students, particularly academic-related pressures and stress have been found to impact the well-being of higher education students (Pascoe, Hetrick, & Parker, 2020). Researchers have found that students experience levels of distress to rise towards the beginning of the semester and to never cease beyond pre-university levels for the duration of their course (Bewick, Koutsopoulou, Miles, Slaa, & Barkham, 2010). During their studies, students proceed through important life transitions and experience an increased sense of independence (Watkins, Hunt, & Eisenberg, 2011). They have reported feeling distressed within a variety of domains, ranging from general emotional problems, such as worrying and feelings of anxiety (Kumaraswamy, 2013), to academic, time management and financial demands (Beiter et al., 2015; El Ansari & Stock, 2010). Higher education is for a majority of the students, a time of great change and the consequential experiences have been noted as distressing and overwhelming to many students (Thurber & Walton, 2012).

In order to adapt to such stressors, adaptive coping behaviours have been found to regulate their impact on student well-being (Kohler Giancola, Grawitch, & Borchert, 2009). Stress by definition is the evaluation of a person-environment relationship as significantly exceeding one's resources for coping. Upon a stressful situation, a person evaluates the situation considering a choice of coping behaviour, based on the judgement of perceived controllability of the situation. This judgement depends on the persons self-efficacy (Chesney, Neilands, Chambers, Taylor, & Folkman, 2006). Bandura (1997) refers to self-efficacy, in his social cognitive theory, as "beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments". A persons' self-efficacy impacts their level and persistence of efforts made to act effectively (Zhang, Li, Zhang, & Chen, 2016). Furthermore, the level of self-efficacy in higher education students has been linked to foster motivation, academic accomplishments and the development of intrinsic interest in academic subject matter (Bandura, 1997). It has been found to prevent academic stress in students (Denovan & Macaskill, 2017), contribute to achievement enhancement and ultimately improving well-being (Bandura and Locke, 2003). In facing academic-related pressures, students require adaptive coping behaviours. Self-efficacy beliefs have been identified to be an integral part in influencing this choice of coping behaviour. Specifically, this is known as an individuals' coping self-efficacy which refers to the belief in one's ability to cope effectively. One's coping self-efficacy is an important prerequisite to changing coping behaviour (Chesney et al., 2006) and hence deal with stressors experienced by students. This heavily suggests the importance of

high coping self-efficacy in students, in order to obtain adaptive coping behaviours to cope with stressors and ensure well-being.

Strengths use and Well-being

Another well-established construct in relation to well-being, is the study of character strengths. A character strength is by definition "a disposition to act, desire, and feel that involves the exercise of judgment and leads to a recognizable human excellence or instance of human flourishing" (Yearley, 1990). The use of strengths makes students feel more content about themselves and their abilities, motivating them to fulfil their potential (Linley & Harrington, 2006), promoting stronger vitality and well-being (Govindji & Linley, 2007). Zhang and Chen (2018) have showed that it is the usage of strengths that is the predictor of achieving optimal functioning. The use of our strengths promotes a positive self-image, increasing our ability to achieve things, as well as positively developing the tendency of working towards fulfilling our potential (Linley & Harrington, 2006). Within higher education students, strengths use is associated with improved goal process, psychological need fulfilment and enhanced well-being (Linley, Nielsen, Gillet, & Biswas-Diener, 2010). Whilst facing many stressors as aforementioned, students have shown to develop on a variety of psychological dimensions, their interpersonal horizons as well as individual autonomy and maturity, making higher education a fertile setting for studying character strengths (Lounsbury, Fisher, Levy, & Welsh, 2009).

Studies have also linked student strengths use to general self-efficacy (Proctor, Maltby, & Linley, 2011). By heightening students' level of perceived competence in respect to their academic performance (Linley & Harrington, 2006), the improvement of their features of strengths enables a decrease in stress (Proctor et al., 2011). Moreover, the increased use of strengths enables a more accurate judgment of expectancies. It facilitates the matching of one's abilities to external challenges, which fosters intrinsic motivation and engagement, goal setting and striving (Zimmerman, 2000). It is the students' increased control over their actions and behaviour due to strengths use that in turn increases self-efficacy (Loton & Waters, 2017). Whilst the relationship between strengths use and general self-efficacy has been substantiated by previous researchers, there is no previous research on the impact of student strengths use on coping self-efficacy specifically, despite the existing literature having established the importance of coping self-efficacy in maintaining the well-being of higher education students. Based on the positive impact of strengths use on general self-efficacy in higher education students, this study predicts a relation between strengths use on coping self-efficacy for higher education students. Furthermore, based on the previous exploration of

literature, the study predicts a positive relation between coping self-efficacy and well-being in higher education students. The aim of the current study was to explore the expected relationship between the three variables, in that coping self-efficacy mediates the relationship between strengths use and well-being for higher education students. The expected relationship is depicted below (Figure 1).

As of current knowledge, coping self-efficacy has not yet been explored in the context of being a mediator for strengths use on well-being in higher education students. This study aims to fill a gap in existing literature and explore this relationship, aiming to further ground the understanding of well-being in higher education students. Students are society's investment for the future. Ensuring their mental health and well-being is in itself important as individuals but is also essential to the society's well-being (Kumaraswamy, 2013). The following research question was developed for this study: Does coping self-efficacy mediate the relationship between strengths use and coping well-being among higher education students? In order to evaluate the research question, four hypotheses (H) were tested.

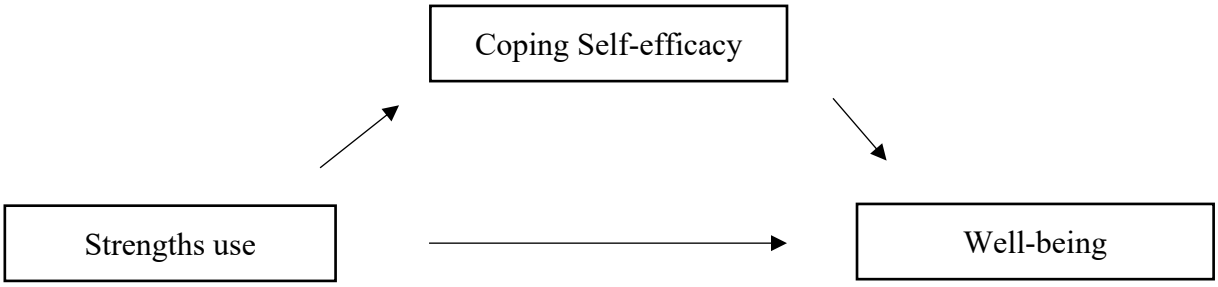

Figure 1. Graphical representation of expected relationship between strength's use, coping self-efficacy and well-being among higher education students

H1: There is a significant positive relation between strengths use and well-being in higher education students.

H2: There is a significant positive relation between strengths use and coping self-efficacy in higher education students.

H3: There is a significant positive relation between coping self-efficacy and well-being in higher education students.

H4: Coping self-efficacy serves as a mediator in the relationship between strengths use and well-being in higher education students.

Method

Participants

The current study had a total of 114 respondents. The data was screened for missing values and according to the inclusion criteria of being 18 years of age and currently being in higher education, 25 respondents were excluded. Furthermore, extreme outliers were determined based on the interquartile range equation (Tukey, 1977). By subtracting three times the interquartile range from the first quartile and adding three times the interquartile range to the third quartile (*Q1 – 3*IQR and Q3 + 3*IQR)*, one further participant was excluded. The final sample included 88 students (M_{age} = 21.39; SD = 2.88); 37.5% (n = 33) male, 62.5% (n = 55) female. The participants were 76.1% (n = 67) German, 2.3% (n = 2) Dutch and 21.6% (n = 19) of other nationality.

Materials

In order to answer the research question, three variables had to be investigated: strengths use, coping self-efficacy and well-being. To evaluate these three variables, participants were presented with three scales that were combined into the final questionnaire. The three scales used were the *Strengths Use Scale* (SUS), the *Coping Self-Efficacy Scale* (CSES) and the *Mental Health Continuum-Short Form* (MHC-SF).

Strengths Use Scale (SUS)

Strengths use of students was assessed via the *Strengths Use Scale* (SUS; Govindji & Linley, 2007). The SUS is a 14-item scale measuring the extent to which people use their strengths. Items included are e.g. “I am regularly able to do what I do best” and “I always play to my strengths” (see Appendix A). Respondents are provided with a 7-point Likert scale (1 – “*Strongly Disagree*” to 7 – “*Strongly Agree*”). Items are summated to create a total score (maximum 98), higher scores indicative of greater strengths use. Scores can be compared to the SUS findings of Govindji and Linley (2007) on a student population (*M* = 64.83 and *SD* = 14.09). The psychometric properties of the scale have shown excellent internal consistency (α = .94) and high test-retest reliability (*r* = .84). The scale has good criterion validity with well-being (Wood at al., 2011). The Cronbach’s alpha of the current study demonstrated good internal consistency for the scale (α = .87).

Coping Self-Efficacy Scale (CSES)

Coping self-efficacy was assessed via the *Coping Self-Efficacy Scale* (CSES; Chesney et al., 2006). The CSES is a 26-item measure of one's confidence in performing coping behaviour when facing life challenges. It measures the use of problem-focused coping, receiving of social support and stopping unpleasant emotions and thoughts. Participants are given the statement "When things aren't going well for you, or when you're having problems, how confident or certain are you that you can do the following:" and are presented with statements such as e.g. "Keep from getting down in dumps" and "Talk positively to yourself" (see Appendix A). Respondents are asked to rate on an 11-point Likert scale the extent to which they believe they could perform behaviours important to adaptive coping (anchors 0 – "*cannot do at all*", 5 – "*moderately certain can do*", and 10 – "*certain can do*"). Item scores are summated to create an overall CSES score (maximum 260). The higher the score, the higher the level of coping self-efficacy. The CSES has good internal consistency for receiving social support ($\alpha = .80$) and excellent internal consistency for measures of using problem-focused coping ($\alpha = .91$) and stopping unpleasant emotion and thoughts ($\alpha = .91$). The internal consistency of the current study was excellent ($\alpha = .91$). Additionally, test-retest correlation coefficients were strong ranging from .40 to .80 up to 12-month data (Chesney et al., 2006). Furthermore, validity analyses showed that changed scores were predictive of decreased levels of psychological distress and increased levels of well-being (ranging $\beta = 0.21$ to 0.35, $p < .001$) (Chesney et al., 2006).

Mental Health Continuum-Short Form (MHC-SF)

In order to assess well-being, the *Mental Health Continuum-Short Form* (MHC-SF; Keyes, 2006) was used. The MHC-SF consists of 14 items representative of emotional (3 items), psychological (6 items) and social well-being (5 items). Confirmatory factor analysis confirmed the 3-factor structure in these three facets of well-being (Lamers, Westerhof, Bohlmeijer, ten Klooster & Keyes, 2011). Respondents are asked "In the past month, how often did you feel…" and are presented with items such as e.g. "happy" and "interested in life" (see Appendix A). Respondents are asked to rate the frequency of every feeling on a 6-point Likert scale (1 – "*Never*" to 6 – "*Every day*"). Item scores on a scale of 0-5 are summated and divided by the number of items to create an overall score (maximum 6), a higher score indicate of greater well-being. Scores are compared to norms by Keyes (2009) based on a Dutch population aged 18-29 ($M = 3.05$, $SD = 0.78$). The MHC-SF has shown high internal consistency ($\alpha = .89$) and

questionable test-retest reliability (r = .68) (Lamers et al., 2011). The Cronbach's alpha of the current study was good (α = .89).

Procedure

The study had been approved by the BMS ethics committee of the University of Twente before the start of data collection (case number 200390). Participants were recruited using a convenience sample with people close to the researcher being contacted personally and asked to participate. The social media platforms Facebook and Instagram were also used to distribute the survey. Snowball sampling was used when previous participants were asked to spread the survey to fellow known individuals fitting the inclusion criteria. Furthermore, the survey was uploaded to the Sona-system test subject pool of the BMS faculty at the University of Twente, for which participants received 0.25 Sona credits for their participation. During recruitment, interested participants received an information sheet (see Appendix B) in which they were informed about the aim and procedure of the study. Furthermore, they were guaranteed that their participation was voluntary and that all responses were anonymous. At the start of the survey, participants were then presented with an online informed consent form on which they had to check either "*Yes"* or "*No"* in order to continue the survey (see Appendix B). Subsequently, participants were asked to report their age, gender, whether they were currently in higher education as well as their nationality. After this, the participants were presented with the SUS, CSES and MHC-SF successively. Items of tests were shown on three separate pages. The estimated time for completion of the survey was 5-10 minutes. At the end of the survey, participants were thanked for their participation and confirmed that their answers were saved.

Data Analysis

The data of the participants was transferred to IBM SPSS Statistics Software (Version 24.0). The data was screened for missing values according to the inclusion criteria of being 18 years of age and currently being in higher education. Furthermore, extreme outliers were excluded in order to reach the final sample of 88 higher education students for statistical analysis. Firstly, the reliability of data was assessed using Cronbach's alpha and the value was compared to previous studies. A value equal to or greater than 0.7 was considered an acceptable reliability (Santos, 1999). Then descriptive statistics of age, gender and nationality of participants were calculated. In order to answer the research question, a mediation analysis was conducted. The cut-off p-value used was < .001. One assumption for mediation analysis is the normal distribution of data. The skewness and kurtosis of data were computed in order to check for

normal distribution of data. Data was considered normally distributed between the cut-off values of -2 and 2 (George & Mallery, 2010). The dependent variable (DV) was well-being, the independent variable (IV) was strengths use. The mediator variable (M) for the analysis was coping self-efficacy. The mediation effect was confirmed when the relation between strengths use (IV) and well-being (DV) (direct causality) was no longer significant when strengths use (IV) predicted coping self-efficacy (M), which in turn predicted well-being (DV) (indirect causality) (displayed in Figure 2).

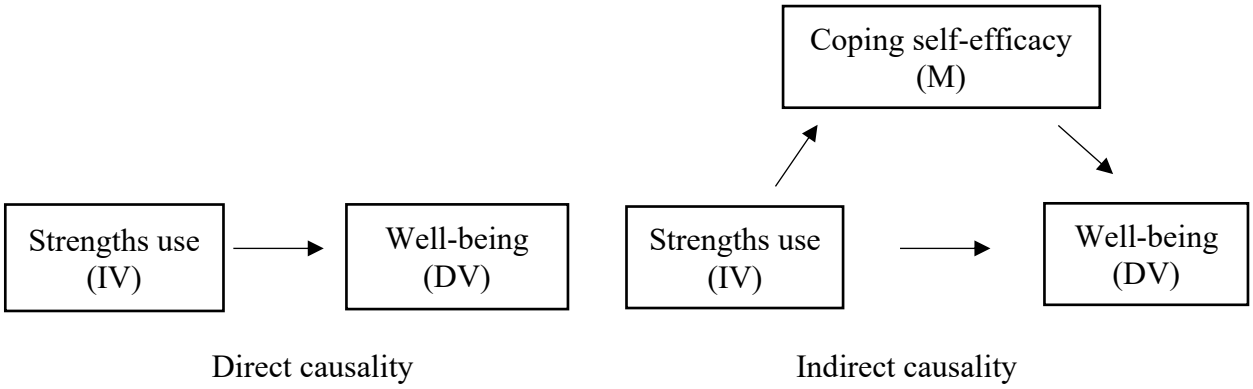

Figure 2. The expected mediation analysis among the strengths use (IV), well-being (DV) and coping self-efficacy (M)

Mediation analysis was performed using PROCESS Macro (Hayes, 2013). Four steps were conducted. In step 1, the regression between strengths use and well-being, whilst ignoring the variable of coping self-efficacy, was tested (IV → DV). In step 2, the regression between strengths use and coping self-efficacy was tested (IV → M). Step 3 tested the regression between coping self-efficacy and well-being (M → DV). And lastly in step 4, in order to confirm the mediation effect, the insignificance of the relationship between strength use and well-being in the presence of the coping self-efficacy was tested (IV|M → DV). The statistical significance of this indirect effect (IV → DV) was tested using bootstrapping. The effect was considered significant when the bootstrapped 95% confidence interval did not contain 0.

Results

Before the statistical analysis of data, outliers were determined, and descriptive statistics were compared to previous studies. Then in order to test the hypothesis, four steps were undertaken to perform the mediation analysis.

Descriptive statistics

Based on previous studies and norm values, scores were compared and analysed. Participants scored slightly above average, less than one standard deviation above the mean on strengths use (M = 74.17, SD 9.53). Scores on coping self-efficacy were above the middle value of the range (M = 159, SD = 34.7) and scores on the MHC-SF were also less than on standard deviation above the mean (M = 3.1, SD = .84), indicating that participants had a slightly above average level of strengths use, coping self-efficacy and well-being. The Cronbach's alpha was computed and demonstrated good internal consistency for all scales (in reference to the *Materials* section of current report). The skewness and kurtosis of data showed that the data was normally distributed (Table 1).

Table 1

Descriptive statistics and psychometric properties of data (N = 88)

Variable	M	SD	Skewness	Kurtosis
1. SUS	74.17	9.53	-1.21	1.91
2. CSES	159	34.7	-.37	1.0
3. MHC-SF	3.10	.84	-.59	-.1

Note. SUS = Strengths Use Scale. CSES = Coping Self-Efficacy Scale. MHC-SF = Mental Health Continuum - Short Form.

Mediation analysis

In order to answer the research question, the four hypotheses were tested in a series of four steps (results depicted in Figure 3). In step 1, the regression of strengths use on well-being, was found to be positive and significant, b = .04, $t(86) = 4.76$, $p < .001$. The higher the students' score of strengths use, the higher was their score on well-being. This result indicated that the use of strengths in higher education students predicts well-being. In step 2, the regression of strengths use on coping self-efficacy was also found to be positive and significant, b = 2.06, $t(86) = 6.36$, $p < .001$. The higher the score of strengths use, the higher was their score on coping self-efficacy, indicating that strengths use in higher education students predicts coping self-efficacy. Step 3 showed that the effect of coping self-efficacy on well-being was positive and significant, b = .01, $t(85) = 4.61$, $p < .001$. Students with higher scores on coping self-efficacy also scored higher on well-being. This demonstrates that higher coping self-efficacy predicts well-being in higher education students. Lastly, step 4 revealed that whilst controlling for

coping self-efficacy, strengths use was no longer a significant predictor of well-being (direct effect) $b = .02$, $t(85) = 1.76$, $p = .08$. Bootstrapping confirmed the indirect effect of strengths use on well-being to be statistically significant at $b = .03$ [95% CI: -.04; -.01]. This suggests that coping self-efficacy does mediate the relationship between strengths use and well-being.

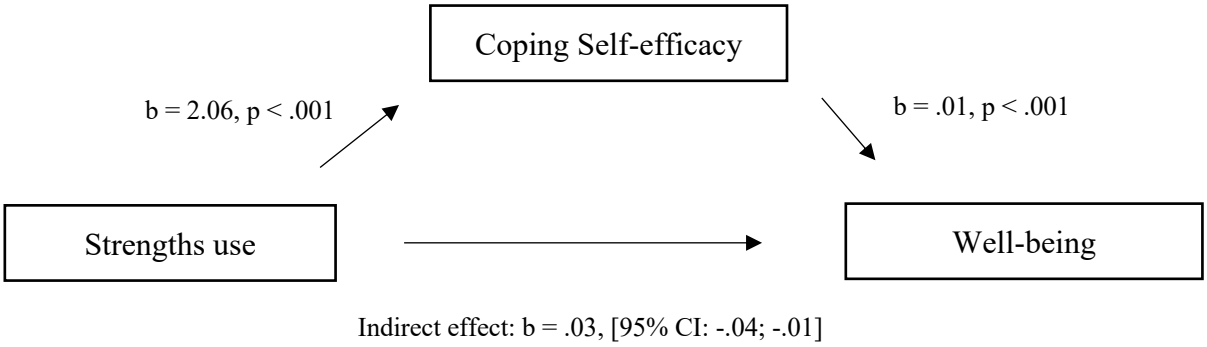

Figure 3. Graphical representation of results of mediation analysis

Based on this analysis, H1, H2 and H3 were able to be accepted. H4 was also accepted since there was no longer a significant relation between strengths use and well-being which shows that coping self-efficacy serves as a mediator in the relationship between strengths use and well-being in higher education students.

Discussion

As an effort to evaluate the, prior to this study, undiscussed impact of coping self-efficacy on the relationship between the strengths use and the well-being of higher education students, the following research question was developed: Does coping self-efficacy mediate the relationship between strengths use and well-being among higher education students? The results have allowed to answer the research question. Coping self-efficacy was found to predict the relationship between strengths use and well-being among higher education students.

The current study has shown that strengths use predicts well-being in higher education students as it has been expected. This is in line with previous research (Linley et al., 2010) that has explored the association between strengths use and well-being among college students. These results can be explained by the fact that strengths use increases our self-worth and our ability to achieve things, which in turn is associated with well-being (Linley & Harrington, 2006). This is relevant for higher education students in that an increased ability to achieve things can be related to academic or social demands experienced by students. Demands and pressures have been recognised to be detrimental to student well-being (Pascoe et al., 2020)

and minimising pressures through an increased ability can therefore predict well-being (Linley & Harrington, 2006; Linley et al., 2010)

Moreover, the study showed that the use of strengths predicts coping self-efficacy in higher education students. Research by Proctor et al. (2011) has demonstrated that university students' strengths use was positively correlated with general self-efficacy. The current study expected similar results for the relation between strengths use and coping self-efficacy in higher education students. Findings of Linley and Harrington (2006) have found that the use of strengths makes students feel more content about themselves and their abilities (Linley & Harrington, 2006). They experience a heightened level of perceived competence to perform in their studies (Linley & Harrington, 2006) and are able to make more accurate judgements of expectancies. Strengths use increases control over behaviour, which in turn increases self-efficacy (Loton & Waters, 2017). This can explain the findings of the current study in that strengths use strengthens students' belief in themselves, which in turn are necessary when choosing coping behaviour and hence regulate the belief in their coping behaviour.

Furthermore, as expected, the current study has shown that coping self-efficacy predicted for well-being in higher education students. The examined results may be explained by previous studies that have linked higher coping self-efficacy to adaptive coping behaviours. In their study, Delahaij and Van Dam (2017) have explored the impact of coping self-efficacy on the appraisal of a stressful situation. They have found that low coping self-efficacy individuals might appraise a situation as threatening, whilst high coping self-efficacy individuals might perceive it as a challenge. In line with Lazarus' (1991) appraisal theory, threatening appraisal might lead to negative emotions, whereas a challenging appraisal would rather lead to positive emotions. The appraisal and associated negative or positive emotions in turn impact the effectiveness of coping behaviour (Delahaij & Van Dam, 2017). Based on this, the study expected this relationship for higher education students. Coping self-efficacy determines the belief in choice of coping behaviour. Findings of the study are in line with the study of Kohler Giancola et al. (2009), that have found student cognitive appraisal style to be strongly predictive of their coping choices. These choices of certain coping behaviours in turn have been predictive of general well-being for higher education students (Kohler Giancola et al., 2009). This indicates how coping self-efficacy is expected to impact well-being in higher education students.

These three relationships coincide with existing literature and confirm the anticipated outcome previous to the study. Furthermore, they built the foundation for the fourth hypothesis (H4), which stated that coping self-efficacy serves as a mediator in the relationship between

strengths use and well-being in higher education students. The mediation analysis revealed that there was no longer a significant relation between strengths use and well-being in higher education students in the presence of coping self-efficacy, indicating that the hypothesis was able to be accepted. This finding is in line with previous findings by Chesney et al. (2006) that have shown the importance of coping self-efficacy in adaptive coping behaviour, which is expected to predict well-being in students (Kohler Giancola et al., 2009). This suggests that higher education students who use their strengths experience increased coping self-efficacy than those who do not use their strengths. In turn the higher coping self-efficacy predicts well-being in students. It is coping self-efficacy that is the essential bridge in the relationship between strengths use and well-being in higher education students.

Limitations and Recommendations

The study entails some limitations that are noteworthy to mention due to the possible impact on the reliability and validity of results. Upon the mentioned limitations of the current study, recommendations have been given. One limitation regards the recruitment of participants. The majority of participants were recruited from the faculty of behavioural, management and social sciences (BMS) at the University of Twente. The sample might not be representative of the general student population or of other faculties even. This limits the generalisability of results to the general higher education student population. It might have influenced the results as it is expected that students from different faculties display differences in awareness and use of strengths. Furthermore, in line with this, the use of a convenience sample could have led to a response bias in which, despite anonymity had been ensured, participants responded in a manner that would be considered favourable to others. Based on this, the scores on strengths use, coping self-efficacy and well-being could have been higher than participants' actual scores, in turn influencing the results of the analysis. Despite the results demonstrating a normal distribution and data being only slightly above average, it is recommended that the study should be replicated using a larger sample of students across several faculties, distributed through other platforms to increase the generalisability of results.

Another limitation is that several participants voiced their concerns about having had difficulties in understanding the concepts of "strengths use". Participants might not have been aware of their strengths before this study and could have misunderstood the term which might have impacted the validity of results. This can be expected because a misunderstanding of key terms impacts the understanding of survey items and therefore the responses of participants. This could lead to scores not being representative of actual strengths use. Due to providing

participants with an information sheet at the beginning of the study, they were given the opportunity to ask questions about the study in an attempt to minimise any uncertainty. Nevertheless, one recommendation for future research would be to ensure that the concept of strengths use is fully understood before the study. In addition to the information sheet, the researcher could provide a short definition and summary of strengths and how they can be used in order to ensure that participants understand the term. Furthermore, participations could undertake the Values in Action Inventory (VIA) before starting the survey. By doing so, participants can become aware of their strengths as well as increase their understanding of the study and its aims. Furthermore, the VIA inventory of strengths could be used to identify the individual strengths of higher education students. Whilst the study has explored the general use of strengths, research into specific strengths use and its impact on coping self-efficacy and well-being might be of interest to both students and academics. It would be beneficial to know whether all strengths act similarly or whether some strengths impact coping self-efficacy and hence well-being more than others. This knowledge could aid students in their quest for well-being by becoming aware of their strengths.

Lastly, it should be taken to account that the survey was conducted at the start of the COVID-19 coronavirus pandemic and the beginning of lockdown measures (end of march for Germany). The scope of the impact on the participants and consequentially the data from the current study has not yet been measured. Nevertheless, such a time of uncertainty and change is most likely significant in regard to the well-being of higher education students and should therefore be taken into account when analysing the results. Previous experiences with isolation measures due to medical reasons have been linked to an increase in mental distress (Torales, O'Higgins, Castaldelli-Maia, & Ventriglio, 2020). The outbreak is leading to additional mental health problems, such as stress and anxiety and the fear of the unknown leads to increased anxiety levels in both healthy people and those with pre-existing mental health problems (Torales et al., 2020). This is important to consider, as measures of well-being in participants of the study might not be impacted by academic-related pressures solely, but also by the COVID-19 lockdown measures and its scope. Despite participants' scores of the MHC-SF being comparable to previous studies and the norm population of Dutch students (Keyes, 2009), it is nevertheless recommended to replicate the study at a time at which students are no longer restricted and are attending higher education as usual.

Strong points and Practical implications

The current study also holds strong points based on which practical implications for the future have been proposed. The first strong point to mention is that the findings of the current study attribute to the findings of previous studies and the results of the study once again stress the importance of strengths use for higher education students. As suggested by several researchers in this domain, identifying, developing and using our strengths helps us flourish rather than simply function (Clifton & Anderson, 2004). Based on the findings of this study, strengths use is expected to be an ideal approach for students in respect to their immediate exposure to challenges and developments in a variety of dimensions (Lounsbury et al., 2009). Places of education are seen as the ideal institutions to teach strengths use (Peterson, 2006) and should therefore be used to strengthen coping self-efficacy and facilitate well-being in students.

Another strong point important to mention is that this study was the first as of current knowledge to have explored the impact of coping self-efficacy on the relation between strengths use and well-being for higher education students. The study has explored how exactly strengths increase well-being, in that coping self-efficacy was found to be the necessary "bridge" between strengths use and well-being among higher education students. This deeper understanding of practices is beneficial for both students themselves as well as psychologists and other professionals in the academic setting. The obtained knowledge can be put into practice and be incorporated into strengths-use programs. Coping self-efficacy is malleable and can therefore increase. It can be enhanced via modelling, positive feedback, performance attainments, vicarious learning and physiological or psychological arousal (Bandura, 1997). Interventions and strengths-use programs could be (re-) designed to focus on improving coping self-efficacy in students via the use of strengths. A similar approach has already been successfully established for character-strengths based interventions in adolescents, resulting in increased self-efficacy. The results had showed increases in confidence, enhanced motivation and coping behaviours whilst prior knowledge of strengths was not even necessary (Toback, Graham-Bermann, & Patel, 2016). Worldwide, strengths-based approaches are being integrated into academics, aiming for academic improvement in students. Researchers are becoming increasingly aware of the importance of providing learning experiences that enhance and support student's well-being (Stanton, Zandvliet, Dhaliwal, & Black, 2016). Within the educational setting, class structures, course design and curricula can be intentionally designed to enhance well-being (Stanton et al., 2016). Clifton and Anderson (2004) have already established specific intervention sessions, which aim to improve college students' academic

performance and increase persistence to graduation using strengths. The current study has enabled further research into improving interventions, in order to increase the well-being of higher education students by using their strengths and strengthening their coping self-efficacy.

Conclusion

The purpose of the study was to explore the impact of coping self-efficacy on the relationship between strengths use and well-being in higher education students. Findings of the study indicate that higher education students who use their strengths experience greater coping self-efficacy, and increased coping self-efficacy in turn predicts well-being in students. These findings were in line with existing literature and the initial hypotheses prior to the study. Overall this research has stressed the importance of enabling students to use their strengths. Higher education students should be pushed towards the use of their strengths in order to increase their coping self-efficacy and in turn ensure their well-being. The well-being of students is important for individuals themselves, but also to ensure society's well-being. Within higher education, students face a period of self-exploration which is important to many young adults in shaping their lives. It can be a critical point to intervene and aid students in the development of their character. Academic institutions have the ability to impact students' mental health and their social, educational, and economic well-being and should do so. The exploration of their use of strengths, coping self-efficacy and well-being can be seen as the steppingstone for student academic achievement and also the rest of their lives.

References

American College Health Association. (2015). American college health association-national college health assessment II: Reference group executive summary. *Hanover, MD: American College Health Association*.

Bandura, A. (1997) *Self-Efficacy. The Exercise of Control,* New York: W. H. Freeman and Company.

Bandura, A., & Locke, E. A. (2003). Negative self-efficacy and goal effects revisited. *Journal of applied psychology*, *88*(1), 87. doi:10.1037/0021-9010.88.1.87

Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of affective disorders*, *173*, 90-96. doi:10.1016/j.jad.2014.10.054

Bewick, B., Koutsopoulou, G., Miles, J., Slaa, E., & Barkham, M. (2010). Changes in undergraduate students' psychological well-being as they progress through university. *Studies in Higher Education*, *35*(6), 633-645. doi:10.1080/03075070903216643

Bonell, C., Humphrey, N., Fletcher, A., Moore, L., Anderson, R., & Campbell, R. (2014). Why schools should promote students' health and wellbeing. doi: 10.1136/bmj.g3078

Brady-Amoon, P., & Fuertes, J. N. (2011). Self-Efficacy, Self-Rated abilities, adjustment, and academic performance. *Journal of Counseling & Development*, *89*(4), 431-438. doi:10.1002/j.1556-6676.2011.tb02840.x

Chesney, M. A., Neilands, T. B., Chambers, D. B., Taylor, J. M., & Folkman, S. (2006). A validity and reliability study of the coping self-efficacy scale. *British journal of health psychology*, *11*(3), 421-437. doi:10.1348/135910705X53155

Clifton, D. O., Anderson, E., & Schreiner, L. (2004). StrengthsQuest: Develop your strengths in academics, career and beyond. *Washington, DC: The Gallup Organization*.

Delahaij, R., & Van Dam, K. (2017). Coping with acute stress in the military: The influence of coping style, coping self-efficacy and appraisal emotions. *Personality and Individual Differences*, *119*, 13-18. doi: 10.1016/j.paid.2017.06.021

Denovan, A., & Macaskill, A. (2017). Stress and subjective well-being among first year UK undergraduate students. *Journal of Happiness Studies*, *18*(2), 505-525.

Dubreuil, P., Forest, J., & Courcy, F. (2014). From strengths use to work performance: The role of harmonious passion, subjective vitality, and concentration. *The Journal of Positive Psychology*, *9*(4), 335-349. doi:10.1080/17439760.2014.898318

Eisenberg, D., Downs, M., & Golberstein, S. (2009). Stigma and help-seeking for mental health among college students. *Medical Care Research and Review*, *66*(5), 522–541. doi:10.1177/1077558709335173

El Ansari, W., & Stock, C. (2010). Is the health and wellbeing of university students associated with their academic performance? Cross sectional findings from the United Kingdom. *International journal of environmental research and public health*, *7*(2), 509-527. doi:10.3390/ijerph7020509

George, D., & Mallery, P. (2010). SPSS for Windows Step by Step: a Simple Guide and Reference, 17.0 Update, 10th.

Govindji, R., & Linley, P. A. (2007). Strengths use, self-concordance and well-being: Implications for strengths coaching and coaching psychologists. *International Coaching Psychology Review*, *2*(2), 143-153.

Hayes, A. F. (2013). Model templates for PROCESS for SPSS and SAS.

Horwitz, A. V., & Scheid, T. L. (Eds.). (1999). *A handbook for the study of mental health: Social contexts, theories, and systems*. Cambridge University Press.

Johnson, L. R., & Sandhu, D. S. (2007). Isolation, adjustment, and acculturation issues of international students: Intervention strategies for counselors.

Kessler, R. C., Berglund, P., Demler, O., Jin, R., Meriakngas, K. R., & Walters, E. E. (2005). Lifetime prevalence and age-of-onset distributions of DSM-IV disorder on the national co-morbidity survey replications. Archives of General Psychiatry, 62, 593-602. doi:10.1001/archpsyc.62.6.593

Keyes, C. L. (2006). The subjective well-being of America's youth: Toward a comprehensive assessment. *Adolescent & Family Health*.

Keyes, C. L. M. (2009). Brief description of the mental health continuum short form (MHC-SF). Atlanta, GA: Emory University.

Keyes, C. L., Eisenberg, D., Perry, G. S., Dube, S. R., Kroenke, K., & Dhingra, S. S. (2012). The relationship of level of positive mental health with current mental disorders in predicting suicidal behavior and academic impairment in college students. *Journal of American College Health*, *60*(2), 126-133. doi:10.1080/07448481.2011.608393

Kohler Giancola, J., Grawitch, M. J., & Borchert, D. (2009). Dealing with the stress of college: A model for adult students. *Adult Education Quarterly*, *59*(3), 246-263. doi:10.1177/0741713609331479

Kumaraswamy, N. (2013). Academic stress, anxiety and depression among college students: A brief review. *International review of social sciences and humanities*, *5*(1), 135-143.

Lamers, S. M., Westerhof, G. J., Bohlmeijer, E. T., ten Klooster, P. M., & Keyes, C. L. (2011). Evaluating the psychometric properties of the mental health continuum-short form (MHC-SF). *Journal of clinical psychology*, *67*(1), 99-110. doi: 10.1002/jclp.20741

Lazarus, R. S. (1991). Progress on a cognitive-motivational-relational theory of emotion. *American psychologist*, *46*(8), 819.

Linley, P. A., & Harrington, S. (2006). Strengths coaching: A potential-guided approach to coaching psychology. International Coaching Psychology Review, 1(1), 37- 46.

Linley, P. A., Nielsen, K. M., Gillett, R., & Biswas-Diener, R. (2010). Using signature strengths in pursuit of goals: Effects on goal progress, need satisfaction, and well-being, and implications for coaching psychologists. *International Coaching Psychology Review*, *5*(1), 6-15.

Loton, D. J., & Waters, L. E. (2017). The mediating effect of self-efficacy in the connections between strength-based parenting, happiness and psychological distress in teens. *Frontiers in psychology*, *8*, 1707. doi:10.3389/fpsyg.2017.01707

Lounsbury, J. W., Fisher, L. A., Levy, J. J., & Welsh, D. P. (2009). An investigation of character strengths in relation to the academic success of college students. *Individual Differences Research*, *7*(1).

Mental health: strengthening our response. (2018, March 30). Retrieved from: https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response

Morton, S., Mergler, A., & Boman, P. (2014). Managing the transition: The role of optimism and self-efficacy for first-year Australian university students. *Journal of Psychologists and Counsellors in Schools*, *24*(1), 90-108. doi:10.1017/jgc.2013.29

Noble, T., Wyatt, T., McGrath, H., Roffey, S., & Rowling, L. (2008). Scoping study into approaches to student wellbeing.

Oades, L. G., & Anderson, J. (2012). Recovery in Australia: Marshalling strengths and living values. doi:10.3109/09540261.2012.660623

Pascoe, M. C., Hetrick, S. E., & Parker, A. G. (2020). The impact of stress on students in secondary school and higher education. *International Journal of Adolescence and Youth*, *25*(1), 104-112. doi:10.1080/02673843.2019.1596823

Peterson, C. (2006). *A primer in positive psychology*. Oxford university press.

Peterson, C., & Seligman, M. E. (2004). *Character strengths and virtues: A handbook and classification* (Vol. 1). Oxford University Press.

Proctor, C., Maltby, J., & Linley, P. A. (2011). Strengths use as a predictor of well-being and health-related quality of life. *Journal of Happiness Studies*, *12*(1), 153-169. doi: 10.1007/s10902-009-9181-2

Rubley, J. N. (2017). The student-centered university: Pressures and challenges faced by college presidents and student affairs leaders. *The Chronicle of Higher Education*, 3-26.

Santos, J. R. A. (1999). Cronbach's alpha: A tool for assessing the reliability of scales. *Journal of extension, 37*(2), 1-5.

Seligman, M. E., & Csikszentmihalyi, M. (2014). Positive psychology: An introduction. In *Flow and the foundations of positive psychology* (pp. 279-298). Springer, Dordrecht.

Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist*, *45*(4), 249-257. doi:10.1080/00050067.2010.482109

Stanton, A., Zandvliet, D., Dhaliwal, R., & Black, T. (2016). Understanding Students' Experiences of Well-Being in Learning Environments. *Higher Education Studies*, *6*(3), 90-99. doi:10.5539/hes.v6n3p90

Thurber, C. A., & Walton, E. A. (2012). Homesickness and adjustment in university students. *Journal of American college health*, *60*(5), 415-419.For many students, the experience is a stimulating adventure, both socially and intellectually. doi:10.1080/07448481.2012.673520

Toback, R. L., Graham-Bermann, S. A., & Patel, P. D. (2016). Outcomes of a character strengths–based intervention on self-esteem and self-efficacy of psychiatrically hospitalized youths. *Psychiatric Services*, *67*(5), 574-577. doi:10.1176/appi.ps.201500021

Torales, J., O'Higgins, M., Castaldelli-Maia, J. M., & Ventriglio, A. (2020). The outbreak of COVID-19 coronavirus and its impact on global mental health. *International Journal of Social Psychiatry*. doi: 10.1177/0020764020915212.

Tukey, J. W. (1977). *Exploratory Data Analysis* (Vol. 2). Addison-Wesley Publishing Company.

Watkins, D. C., Hunt, J. B., & Eisenberg, D. (2012). Increased demand for mental health services on college campuses: Perspectives from administrators. *Qualitative Social Work*, *11*(3), 319-337. doi:10.1177/1473325011401468

Wood, A. M., Linley, P. A., Maltby, J., Kashdan, T. B., & Hurling, R. (2011). Using personal and psychological strengths leads to increases in well-being over time: A longitudinal study and the development of the strengths use questionnaire. *Personality and Individual Differences*, *50*(1), 15-19. doi:10.1016/j.paid.2010.08.004

World Health Organisation. (2019). *Mental health: fact sheet* [Fact sheet]. Retrieved from https://www.euro.who.int/__data/assets/pdf_file/0004/404851/MNH_FactSheet_ENG.pdf?ua=1

Yearley, L. H. (1990). *Mencius and Aquinas: Theories of virtue and conceptions of courage.* Albany, NY: State University of New York Press.

Zhang, W., Li, K., Zhang, X., & Chen, L. (2016). Coping self-efficacy of Chinese nursing undergraduates with their research projects. *Nurse education today*, *45*, 126-131. doi:10.1016/j.nedt.2016.07.003

Zhang, Y., & Chen, M. (2018). Character strengths, strengths use, future self-continuity and subjective well-being among Chinese university students. *Frontiers in psychology*, *9*, 1040. doi:10.3389/fpsyg.2018.01040

Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary educational psychology*, *25*(1), 82-91. doi:10.1006/ceps.1999.1016

Appendix A

Strengths Use Scale

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

Coping Self-Efficacy Scale

"When things aren't going well for you, or when you're having problem, how confident or certain are you that you can do the following:"

1. Keep from getting down in the dumps.
2. Talk positively to yourself.
3. Sour out what can be changes, and what can not be changed.
4. Get emotional support from friends and family.
5. Find solutions to your most difficult problems.
6. Break an upsetting problem down into smaller parts.
7. Leave options open when things get stressful.
8. Make a plan of action and follow it when confronted with a problem.
9. Develop new hobbies or recreations.
10. Take your mind off unpleasant thoughts.
11. Look for something good in a negative situation.
12. Keep from feeling sad.

13. See things from the other person's point of view during a heated argument.
14. Try other solutions to your problems if your first solutions don't work.
15. Stop yourself from being upset by unpleasant thoughts.
16. Make new friends.
17. Get friends to help you with the things you need.
18. Do something positive for yourself when you are feeling discouraged.
19. Make unpleasant thoughts go away.
20. Think about one part of the problem at a time.
21. Visualize a pleasant activity or place.
22. Keep yourself from feeling lonely.
23. Pray or meditate.
24. Get emotional support from community organizations or resources.
25. Stand your ground and fight for what you want.
26. Resist the impulse to act hastily when under pressure.

Mental Health Continuum-Short Form

"In the past month, how often did you feel…"

1. happy
2. interested in life
3. satisfied in life
4. that you had something important to contribute to society
5. that you belonged to a community (like a social group, or your neighbourhood)
6. that our society is a good place, or is becoming a better place, for all people
7. that people are basically good
8. that the way our society works makes sense to you
9. that you liked most parts of your personality
10. good at managing the responsibilities of your daily life
11. that you had warm and trusting relationships with others
12. that you had experiences that challenged you to grow and become a better person
13. confident to think or express your own ideas and opinions
14. that your life has a sense of direct or meaning to it

Appendix B

Information sheet

Information Sheet for Research

Study Title: The relationship between the use of strengths and well-being among higher education students

Name of researcher: Lisa Schneider
University of Twente – Department of Psychology

The mental health of students of higher/post-secondary education is an internationally recognised important public health issue. A key aspect of positive psychology is focusing on one's strengths in dealing with mental health. Strengths are 'a disposition to act, desire, and feel that involves the exercise of judgment and leads to a recognizable human excellence or instance of human flourishing'- that being, what a person can do well or best. It has been found that humans strive using their strengths. The purpose of this research is to explore the relationship between ones' use of strengths in relationship with well-being.

The research project has been reviewed and approved by the BMS Ethics Committee. There are no known risks to participating in the study and participants can be granted credits using the SONA test-subject pool.

Data collected will be anonymised and safeguarding of personal information will be ensured if handed over to third parties for possible further research. If the participant wishes to withdraw from the study at any time, they can do so without having to give a reason.

If you have a spare 5-10 minutes, I would greatly appreciate your input in my study. If you have any further questions, please do not hesitate to contact me.

Link to survey: https://utwentebs.eu.qualtrics.com/jfe/form/SV_0lk3ZEFbO7DHb6d

I look forward to hearing from you!

Lisa Schneider (l.schneider-1@student.utwente.nl)

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 researcher, please contact the Secretary of the Ethics Committee of the Faculty of Behavioural, Management and Social Sciences at the University of Twente by ethicscommittee-bms@utwente.nl

Informed Consent Form

Informed Consent Document for Research

Study Title: The relationship between the use of strengths and well-being among higher education students
Name of researcher: Lisa Schneider
University of Twente – Department of Psychology

The following information is provided to inform you about the research project and your participation in it. Please read this carefully and feel free to contact the researcher at any given time if questions about this study or the information given below might arise.

The purpose of this study is to explore the relationship between an individuals' use of strengths in relationship with their well-being. The study involves a survey questionnaire to be truthfully completed by the participant themselves. There are no known risks in the participation of this study. The research project has been reviewed and approved by the BMS Ethics Committee. The data collected will be anonymised and the safeguarding of personal information is ensured if handed over to third parties for possible further research. The approximate duration of this survey will be 5-10 minutes.

Statement by person giving consent to participate in this study:

- I am 18 years or older.
- I have read and understood each part of this document.
- I choose freely and voluntarily to participate in this study.
- I understand that I can refuse to answer questions and that I can withdraw from the study at any time, without having to give a reason.

Study contact details for further information:

Lisa Schneider (l.schneider-1@student.utwente.nl)

Contact information for questions about your rights as a research participant:

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 researcher, please contact the Secretary of the Ethics Committee of the Faculty of Behavioural, Management and Social Sciences at the University of Twente by ethicscommittee-bms@utwente.nl