

UNIVERSITY OF TWENTE.

Bachelor thesis

**The mediating effect of coping strategies on the relationship
between character virtues and perceived stress in a student
population**

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Abstract

Background: Students encounter different new situations during their time at college, those encounters are for some a pleasant experience but others report high-stress levels. The way students handle those perceived stressors by using adaptive ways of coping like problem-focused coping strategy seems to influence their levels of perceived stress. Problem-focused coping includes strategies like generating new ways to deal with the problem, evaluating the pros and cons of different options, and a stepwise approach to tackle the problem. The main aim of the present study is to first check correlational relationships between the variables of character virtues, problem-focused coping and perceived stress. Further, a mediating effect of problem-focused coping on the relationship between character virtues/strengths and perceived stress in a student sample.

Method: This quantitative cross-sectional study design consisted of a sample of 119 students. Correlational analyses were applied between the six virtues and the subscale problem-focused coping and the total score for perceived stress within the student sample. Those constructs were further assessed with a mediation analysis, including a multiple linear regression and taking the character virtues as a predictor for perceived stress and being mediated by problem-focused coping.

Results: Within the correlational analyses weak till moderate correlations were found between the virtues wisdom ($r=.364$; $p<.05$), courage ($r=.403$; $p<.05$), humanity ($r=.558$; $p<.05$), justice ($r=.324$; $p<.05$), temperance ($r=.233$; $p<.05$), transcendence ($r=.422$; $p<.05$) and the variable problem-focused coping. No correlations between the virtues and perceived stress or coping and perceived stress were found. Therefore, the assumption to conduct a mediation analysis could not be met. A regression analysis has been conducted to further explore the predictive relationship between virtues and problem-focused coping. Resulting in positive and significant predictive relationships of all previously named virtues towards problem-focused coping.

Discussion: The outcome of the present study further supports the positive association of character strength and virtues. Possessing higher levels of virtues is associated with the use of

more adaptive coping strategy. Resulting in beneficial outcomes when being confronted with a problematic situation

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Introduction

During the time students are in college they can express themselves to explore a different environment, new people and various academic activities. This newly experienced self-exploration and development towards adulthood fosters present character strength and develops new strength throughout their time in college (Lounsbury, Fisher, Levy & Welsh, 2009). Character strengths can not only be fostered in the time of college but can be used to improve the student's academic success (Lounsbury, Fisher, Levy & Welsh, 2009; Kern & Bowling, 2009; Park & Peterson, 2009). Most students enjoy exploring their newly given and short term time as a college student but despite all the enjoyable activities are students exposed to a high amount of stress (Pariat, Rynjah, Joplin & Kharjana, 2014). Furthermore, the academic load and interpersonal conflicts are increased for those individuals, due to the new academic and social environment. The most important stressors for students are internal and external expectations (Duan & Bu, 2017). Students are faced with several factors that contribute to that high amount of stress, for example, most students live in a time of separation from their parental home and their friends. Over 70% of college students report to suffer from moderate amounts of stress and over 10% are suffering from severe stress levels (Abouserie 1994; Pierceall and Keim 2007). Internal stress in student life could be for example the integration of a new social and academic life. Examples for external stressors could be expectations raised from the parental side to complete the study in time with sufficient grade. Housing and financial matters are further external stressors that a student can experience in college life (Shaikh et al., 2004; Pariat, Rynjah, Joplin & Kharjana, 2014).

Stress, in general, can be defined as a mental or emotional strain that has several bodily reactions like sweating or increased heart rate. The common ground of explanation for stress relies mainly on the so-called fight-or-flight response, in which an individual either engages in stressors or disengage (Fevre, Matheny & Kolt, 2003). The way we deal with stressors is closely related to the way how we interpret the situation itself and our bodily reaction to it. In this way,

most individuals are different, as they have different ways of interpreting specific stressors, as for some people a spider might be a reason to leave the room whereas others see spiders as harmless living organisms that will help clear the house of flies (Taylor, Klein, Lewis, Gruenewald, Gurung & Updegraff, 2000). The spider example leaves space that not only the interpretation of the stressor itself might explain an individual's response but also the way one deals with the spider. One could say that the ability to handle the stressor determines the levels of stress experienced by an individual (Morrison & Bennett, 2012). High levels of stress can further lead to suicidal ideation and hopelessness in college students (Feldt, 2008; Mahmoud, Statem, Hall & Lenni, 2012). Perceived stress can also have physical consequences, especially common in college students are symptoms like headaches, sleep disturbance and cold (Deckro et al., 2002; Shaikh et al., 2004).

Traditional psychology would focus in this case on the negative aspects of the students' college life and try to find predictors for those undesirable outcomes to change those into a more positive outcome. For that reason classification handbooks like DSM or ICD have been used to assess individuals with pathological problems (Seligman, Csikszentmihalyi, 2014). Within the last two decades, growing interest has been raised around the topic of what is correct with humans and what contributes to their natural well-being, like for example their internal values or being encouraged in healthy behaviours (Raymond & Raymond, 2019).

Positive Psychology

This growing interest can be covered by the term of positive psychology, which focuses more on strength and how to optimize human life. To grasp this interest Seligman (2004) describes and operationalises the human character and within its strength. Focusing on the more positive side on human beings it appears that positive psychology marked its way into practical applications, several studies stated that the use of positive psychology interventions does not only increase the well being, happiness of the participants but also decreased negative symptoms like low social well-being depression and loneliness (Duan & Bu, 2019; Weiss, Voshaar, Bohlmeijer & Westerhof, 2020). Those interventions showed their functionality not only in counselling sessions but also as online intervention aiming at increasing general happiness and

well-being while decreasing depressive and anxiety symptoms (Görge, Oehler, Hirschhausen, Hegerl & Rummel-Kluge, 2019; Yu, 2020). Those positive effects of such intervention did not only show functionality in the general population but especially under college students. The use of positive psychology in the academic setting has shown that students who focus more on their positive personality traits and disposition are more motivated to engage in academic activities (Pajares, 2001). Focusing on the more positive aspects of one's personality does not only increase the academic motivation but also allows students to further flourish in their personal growth and development (Ouweneel, Blanc & Schaufeli, 2014). This flourishing in college students further enables them to explore more healthy ways to deal with their stress and further reduce the perceived stress level during their time in college (Abouserie, 1994; Gibbons, 2012; Ouweneel, Blanc & Schaufeli, 2014). Flourishment, engagement in healthy ways to cope with stress and reducing the stress level overly results in an increased individual and social well-being (Kern, Waters, Adler & Mathew, 2014). This well-being can further be fostered by focusing on the strengths of one's character (Casad, 2012).

Character strengths and virtues

Considering the term character strength it appears that this term implies more than simply the strength of a character of an individual. Strengths of character are positive personality characteristics that every human being can possess but to a different amount. They can be described as inner determinants which can contribute to a more satisfied and happy life (Peterson, Park & Seligman, 2006). The classification of the human character led to the rise of 24 character strengths that are grouped by 6 virtues (wisdom, courage, humanity, justice, temperance and transcendence). This categorization and classification of character strength can be assessed through the VIA, which can be described as the most widely used tool (Biswas-Diener, 2006). Those character strengths and virtues have shown to be universal across culture and belief (Dahlsgaard, Peterson & Seligman, 2005). They further manifest through human cognition, feelings and behaviour (Niemi, 2013). Furthermore, this setting of categorization enables a more concrete way of assessing, using and enabling the specific

strengths and virtues within an individual. There are multiple purposes for categorization of character strength and they can be applied in several areas of life, for example in academical, social and work environments (Dahlsgaard, Peterson & Seligman, 2005).

Knowing one's very own strength helps to enable individuals to flourish in their life (Wagner, Gander, Proyer & Ruch, 2019). Those strengths and virtues can further be strengthened through regular application in daily life (Duan, Ho, Tang, Li & Zhang, 2014). Studies show that the categorization of Seligman and Peterson (2004), especially shows that character strength contributes to the development of well-being. Well-being can be improved through focusing on the positive traits of one's character, this focus can be achieved for example with a diary about an individual's strengths and further deepened with counselling sessions that imply more ways to use single character strength (Wagner, Gander, Proyer & Ruch, 2019; Heintz & Ruch, 2019).

Those strength-based interventions are further used to improve the general health of people or participants. General health in this context means emotional and social well-being (Dawason, Gerhart & Judge, 2017, Smedema, 2020; Yan, Chan, Chow, Zheng & Sun, 2020). Further intervention suggests that character-strength based approaches are also useful in the context of perceived stress (Harzer & Ruch, 2015; G6rges, Oehler, Hirschhausen, Hegerl & Rummel-Kluge, 2019). Especially in students, character-strength based interventions have been shown to be successful in reducing perceived stress (Duan, Ho, Siu, Li & Zhang, 2015; Duan & Bu, 2017).

Coping strategies

When talking about reducing perceived stress in students it also appears to be of importance to consider how they cope with perceived stressors. Coping can be described as cognitive and behavioural effort to deal with difficult situations and is closely correlated with perceived stress (MacNair & Elliot, 1992). Successfully coping with a stressful encounter would

reduce stress whereas insufficient or maladaptive coping can lead to more perceived stress (Fevre, Matheny & Kolt, 2003; Pariat, Rynjah, Joplin & Kharjana, 2014). Maladaptive coping can best be described as an effort to withdraw from a problematic or stressful situation (Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen, 1986). This withdrawal is further associated with depression, anxiety and stress (Mahmoud, Statem, Hall & Lenni, 2012). One of the most often maladaptive coping strategies, in students is the usage of drugs and alcohol (Lardier, Opara, Reid & Garcia-Reid, 2020). The way people deal with stressful encounters is constantly changing and adapting cognition with the effort to manage internal and external demands to an optimal solution (Perlin & Schooler, 1978). Several theories in the last decades tried to conceptualize different coping strategies to further understand how individuals deal with stressful encounters.

Considering the terminology of problem-focused and emotion-focused coping it appears that especially problem-focused coping (PFC) has shown to result in more positive outcomes in college students (Folkman & Moskowitz, 2000). Students using the problem-focused approach are more likely to directly take action and to dissolve the stressful situation at hand, which includes generating new ways to deal with the problem, evaluating pros and cons of different options, and using a stepwise approach to tackle the problem (Baker & Berenbaum, 2007). The use of those coping strategies can lead to better health outcomes and reduced negative affect, therefore those strategies can be labelled as adaptive coping strategies (Dunkley et al., 2007; Brougham, Zail, Mendoza & Miller, 2009). Emotion-focused coping (EFC) is associated with more negative outcomes like poorer health and increased negative affect. The strategies used within EFC are broad, ranging from positive strategies like positive reinterpretation and seeking social support to more negative one's like denial or focusing on venting out emotions. Despite the positive and negative properties of EFC the predominant view of those strategies is rather maladaptive (Baker & Berenbaum, 2007; Pritchard et al., 2007; Brougham, Zail, Mendoza & Miller, 2009). Therefore, coping strategies involving problem-focused coping are labelled as adaptive coping whereas coping strategies involving emotion-focused coping are labelled as maladaptive coping.

The different styles of coping further intend that dealing with stressful situations can not only be done in various ways but also have several different consequences for different

individuals. In other words one can not state which type of coping might solely be positive or negative since the consequence and outcomes of dealing with stressful encounters differ between individuals (MacNair & Elliot, 1992). Some may find it more convenient to directly tackle and solve a problem whereas others in this kind of situation might simply be overwhelmed. Folkman and his colleagues (1986) described the process of dealing with stressful encounters as more dynamic as previous research suggested. As a dynamic process is not only meant which style of coping is applied but also how an individual evaluates the stressful encounter (Folkman et al., 1986).

Aim of the Study

Studies of character strength-based interventions have shown that the recognition of possessed virtues and character strength can enable the student to expand their repertoires of cognitive appraisal which in turn can further promote more efficient ways to cope with those newly discovered stressors (Seligman & Peterson, 2009; Gustems-Carnicer & Caldéron, 2016). Character virtues and their underlying strength seem to have an influence on how students perceive stress in college situations but also enabling them to further explore and develop their coping strategies (Peterson & Seligman, 2004; Gustems-Carnicer & Calderón, 2016). Literature has shown a relationship between character virtues and perceived stress and further a relationship between developing coping strategies and the recognition of character virtues (Tedeschi & Calhoun, 2004). Further evidence suggests that certain virtues and strength indeed have a predictive relationship with coping strategies. The virtue of wisdom appears to influence opening up new opportunities for individuals, which in turn can mean that those individuals can enable more easily new ways of coping with stressors (Tedeschi & Calhoun, 2004). Additionally, the virtue of courage to be overly linked to a more problem-focused than emotional-focused approach towards problems. Other virtues like humanity and justice are more linked to an emotional approach (Lavy & Littman-Ovadia, 2011).

The way students cope with their perceived stress influences their general stress levels, in terms of maladaptive coping (Folkman, Lazarus, Dunkel-Schetter, DeLongis & Gruen, 1996). Character strength in this case could positively affect this procedure. The knowledge of character strength possessed by one individual can enable this individual to interpret the stressor otherwise and focus more on ways to handle this stressor more effectively, for example, by using more adaptive ways of coping like PFC (Harzer & Ruch, 2015).

According to character strengths and their generally positive effect on stress levels and well-being in students, one might suggest a relationship between those three variables of character-strength, problem-focused coping and perceived stress levels. Therefore, the research question for the present study be formulated:

“To what extent is the relationship between character virtues and perceived stress in students mediated by the adaptive coping strategies of problem-focused coping?” (see Figure 1.)

According to the presented RQ following objectives can be formulated; (1) to analyze the correlational relationship between the three variables of character virtues, coping strategies (problem-focused coping and emotion-focused coping) and perceived stress in a student sample; (2) to further explore the mediating effect of problem-focused coping towards the relationship between character virtues and perceived stress.

Figure 1. Expected mediation effect of PFC on the relationship between virtues and stress

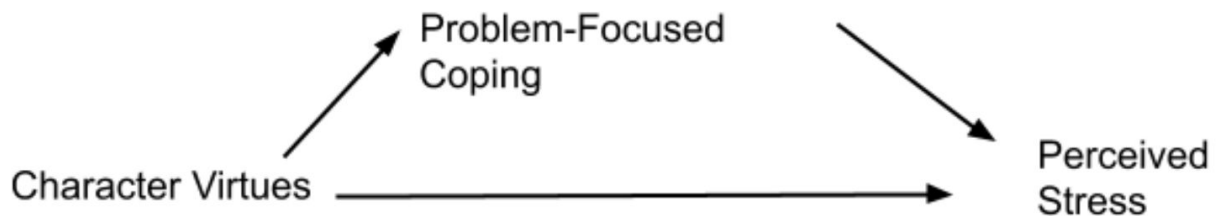


Figure 1. The independent variable character virtues imply the following concepts: wisdom, courage, humanity, justice, temperance and transcendence. Virtues are derived from Peterson and Seligman (2004).

Method

Design

A nonexperimental, quantitative cross-sectional survey design was employed. The study was approved by the Ethics Committee of the Faculty of Behavioural Sciences at the University of Twente (request nr. 200228).

Participants

The study comprised a convenience sample of 119 university students, 79 being female and 40 being male (66.4% female, 33.6% male). Participants were recruited using convenience sampling in two ways. Either based on their acquaintance with the researchers or through SONA, a recruitment system for students of the behavioural sciences at the University of Twente. For the latter, 0.25 credits were awarded for participation. The sample consisted of young adults with an average of 21 years ($M=21.85$, $SD=2.045$), ranging from 18 to 30. 97 participants had German nationality, 7 were Dutch and 15 had other nationalities, including American, Bulgarian, Danish, Irish, Iranian, Italian, Mexican, Swiss and the US.

Materials

The 72-item version of the Values in Action Inventory (VIA-72) was used to measure character strengths (Peterson & Seligman, 2004). It was created by using the most internally stable items from the original 240-item VIA instrument. The questionnaire entails 3 items for each strength respectively, and responses are anchored on a 5-point Likert scale ranging from 1 (“very much unlike me”) to 5 (“very much like me”). An example for measuring the character strength of modesty is “I never brag about my accomplishments”. The VIA-72 shows an internal consistency reliability of $\alpha = .75$ on average and initial validity coefficients between .36 and .48 (Peterson & Seligman, 2004). Within the present study, a Cronbach’s alpha of $\alpha = .89$ could be calculated.

The Coping Strategy Inventory- Short form (CSI-SF) was chosen to assess the preferred style of coping by the participants. Participants are asked to rate the general frequency of their preferred coping strategy in the following manner: 1= “Never”, 2= “Seldom”, 3= “Sometimes”, 4= “Often”, 5= “Almost Always”. The CSI-SF consists of four subscales problem-focused engagement, problem-focused disengagement, emotion-focused engagement and emotion-focused disengagement (Addison, et al., 2007). A reliability and validity study

conducted by Speyer et al., (2016) assessed the Cronbach's Alpha of the CSI-SF in 13 different countries. The outcome of the study showed that the questionnaire persists with a good internal consistency ($\alpha = .568$). Furthermore, both exploratory and confirmatory factor analysis supported the structure of the four dimensions included in the CSI-SF. The only downside was found when comparing the English, German and Swedish version with other language versions which showed an inconsistent factor-loading. Since the present study is conducted solely in English any inconsistencies regarding the CSI-SF are not expected (Speyer, et al., 2016). The four dimensions of the CSI-SF were divided into two, problem-focused coping and emotion-focused coping. Both scales score a sufficient internal consistency with a Cronbach's alpha of $\alpha = .616$ for the emotion-focused coping scale and $\alpha = .656$ for the problem-focused coping scale.

To measure the experienced stress in students, the College Student Stress Scale (CSSS) was chosen. The CSSS is a 11-item questionnaire to assess the perception of academic stress and the ability to maintain control. Stressors like personal relationships, academic concerns and financial matter are assessed by using a five-point Likert scale (1= "Never", 2= "Rarely", 3= "Sometimes", 4= "Often" and 5= "Very Often") (Hourton, 2008). To assess the stress levels of students a total score is calculated, this score ranged from 11-55. In which a higher score represents higher levels of college-related stress (Feldt, 2008). A reliability and validity study has been conducted using Cronbach's Alpha as an indicator, which reports a good convergent validity ($\alpha = .76$) (Feldt, 2008). In this study, the CSSS showed an alpha of $\alpha = .781$.

Procedure

After the authorisation to conduct the study through the Ethics Committee BMS (Department of Behavioral, Management and Social Science) of the University of Twente (UT), the questionnaire was uploaded in Qualtrics and published on SONA UT. To complete the presented study the participants were asked to read and accept an informed consent before starting the questionnaire. Furthermore, the students were asked to complete in total three questionnaires and to indicate their state of mind according to the questions presented. The study, which is presented in the appendix, took the participants approximately 15 minutes.

Data analysis

All analyses were computed with the statistical program SPSS IBM 24. The data set was screened for valid cases and missing cases were excluded from the analysis. Afterwards, all 24 character strengths were computed into the six higher-order virtues (wisdom, courage, humanity, justice, temperance and transcendence). Furthermore, the two subscales of the CSI-SF were constructed by combining problem-focused engagement and disengagement into the scale of problem-focused coping strategy. The scale emotion-focused coping strategy was compiled out of emotion-focused engagement and disengagement. The items of the CSSS were calculated in an overall total score of perceived stress in the student sample. Furthermore, Cronbach's alpha has been used to assess the internal consistency of the presented scales (VIA-72, problem-focused & emotion-focused coping strategies and perceived stress). Then, the data was checked for their descriptives including mean, variance and standard deviation.

Next, these variables were tested for a normal distribution using the Kolmogorov-Smirnov normality test, or Npar test. In the case of normally distributed data the Pearson's r test of correlation would be used. If the results showed a non-normal distribution the Spearman's r test would be used. Moreover, the scale of character virtues (wisdom, courage, humanity, justice, temperance and transcendence), coping strategies (emotion-focused and problem-focused coping) and perceived stress were tested for correlations using the Pearson's r correlation coefficient. The interpretation of the computed correlations could be stated as followed: a coefficient of .00 to .29 was considered a weak correlation, a moderate coefficient is in between .30 and .59, whereas a strong correlation coefficient can be interpreted from a score higher than .60 (Schober, Boer & Schwarte, 2018). To test the mediating effect of PFC on the relationship of character virtues and stress, a multiple linear regression analysis has been computed. If the assumption for conducting a mediation analysis could not be met a linear

regression was conducted to further explore the predictive properties of character virtues and problem-focused coping. In general, a p-value of below .05 was used as a cut-off point for significant results within the correlation and mediation analyses (Fisher, 1992).

Results

Descriptive statistics

In total 119 participants completed the survey. Considering the six virtues of character strength it appears that the virtue humanity possesses the highest mean value ($M=3.88$; $SD=.53$). Other variables that scored nearly the same value are justice ($M=3.82$; $SD=.55$) and courage ($M=3.70$; $SD=.40$). The variables temperance ($M=3.31$; $SD=.49$), transcendence ($M=3.56$; $SD=.48$) and wisdom ($M=3.56$; $SD=.42$) scored the lowest mean values of all measured virtues (see Table 1.).

Table 1

Descriptive statistics of character virtues

<u>Virtue</u>	<u>Mean (SD)</u>	<u>Variance</u>	<u>Minimum</u>	<u>Maximum</u>
Combined Virtues	3.61 (.310)	.096	2.68	4.53
Wisdom	3.56 (.42)	.177	2	5
Courage	3.70 (.40)	.164	2	5
Humanity	3.88 (.53)	.280	2	5

Justice	3.82 (.55)	.301	2	5
Temperance	3.31 (.49)	.246	2	5
Transcendence	3.56 (.48)	.177	3	5

The mean score for the stress scale is $M=2.55$ with a standard deviation of $SD=.587$. Considering the results from the CSI-SF did the problem-focused scale scored the lowest mean values, whereas emotion-focused coping scored the highest (see Table 2.)

Table 2

Descriptive statistics of the CSI-SF and CSSS

Coping-Strategies & Perceived Stress

	<u>Mean (SD)</u>	<u>Variance</u>	<u>Minimum</u>	<u>Maximum</u>
Problem-Focused coping	2.91(.51)	.305	2.00	4.63
Emotion-Focused Coping	3.43(.55)	.266	1.88	4.25
Stress	2.61 (.56)	.319	1.00	4.18

Correlational Analysis

Considering the results of the correlational analysis one can note that all of the character virtues scored a significant correlational relationship towards the adaptive coping strategy of

problem-focused coping. In more detail, a weak significant correlation was found between the virtue temperance and problem-focused coping. Other virtues (wisdom, courage, humanity, justice and transcendence) scored a moderate significant correlation on problem-focused coping. Emotion-focused coping scored a weak but significant correlation on perceived stress (see Table 3). Further, no significant correlation was found between any of the six presented virtues and the emotion-focused coping strategies. Further, correlation of virtues to perceived stress was also found insignificant (see Table 3).

Table 3

Correlation Analysis of higher-order strength, coping strategies and stress

Virtues	Coping strategies		Stress
	Problem-Focused coping	Emotion-Focused Coping	
Wisdom	.364**	-.031 (.740)	.054 (.280)
Courage	.403**	-.159 (.084)	-.131 (.077)
Humanity	.558**	-.179 (.052)	-.106 (.126)
Justice	.324**	.155 (.092)	.010 (.459)
Temperance	.233*	.055 (.555)	-.011 (.452)
Transcendence	.422**	.001 (.989)	-.065 (.242)
Stress	-.017 (.428)	.286**	-

Note. significant correlation are in boldface; *Correlation is significant at the 0.05 level (1-tailed); **Correlation is significant at the 0.01 level (1-tailed); insignificant *p*-values are placed in brackets.

Mediation analysis

Considering the mediation analysis several assumptions had to be checked in order to conduct such an analysis. According to the results of the correlational analysis no significant relationship could be found between the independent variable (character virtues) and the dependent variable (perceived stress). Therefore, it is not advisable to check for a mediating effect of problem-focused coping towards the relationship between independent and dependent variables. Since a significant correlation was found between character virtues and problem-focused coping, a regression analysis has been conducted to further explore this relationship.

As the correlational analysis indicated, a significant relationship was found between all of the character virtues and problem-focused coping (see Table 3). This could further be supported by the use of linear regression, showing that all virtues have a significant and positive relationship on PFC (see Table 4.). Meaning that higher levels of character virtues predict higher levels of adaptive and positive ways of coping with stressors. Assessing the goodness-of-fit using R-square, resulted in rather low levels of this indicator with every model scoring underneath the value of .20, except from humanity scoring .312. When testing the goodness-of-fit with a visualization of the residual plots it appears that the predicted and observed values are plotted sufficiently and can be used to explain the variance within the results (see Appendix D).

Table 4

Regression analysis

Model		Unstandardized			Sig.	R	95.0% confidence interval	
		B	Std. Error	t			Lower bound	Upper Bound
1	(Constant)	1.740	.405	4.298	.000	.132	.938	2.542
	Wisdom	.477	.113	4.221	.000		.253	.700
2	(Constant)	1.180	.313	3.769	.000	.312	.560	1.799
	Humanity	.583	.080	7.282	.000		.424	.741
3	(Constant)	1.403	.430	3.263	.001	.155	.552	2.255
	Courage	.550	.116	4.579	.000		.321	.779
4	(Constant)	2.191	.340	6.440	.000	.105	1.517	2.864
	Justice	.326	.088	3.705	.000		.152	.501
5	(Constant)	2.579	.335	7.702	.000	.054	1.916	3.243
	Temperance	.260	.100	2.592	.011		.061	.458
6	(Constant)	1.461	.395	3.697	.000	.171	.678	2.244
	Transcendence	.555	.110	5.035	.000		.337	.773

Note. Dependent variable: Problem-Focused Coping Strategy.

Discussion

The sample used within the present study consisted mostly of German female students possessing rather average levels of stress. Furthermore, it can be concluded that nearly all character strengths and virtues were present within the individuals tested, with the most dominant virtues being humanity and justice. The other virtues scored slightly lower. Considering the preferred coping strategy it appears that the participants mainly engage in emotion-focused coping whereas problem-focused coping strategies scored a more average level.

In regard to the research question “To what extent is the relationship between character virtues and perceived stress in students mediated by the adaptive coping strategies of problem-focused coping?” no mediating effect of the variable problem-focused coping was found because the assumption of an underlying significant correlation relationship between those variables was not met. Meaning that no significant correlation was found between the variables problem-focused coping and stress, and character virtues and perceived stress. Interestingly, a positive and significant relationship was found between every single character virtue and problem-focused coping. Those results give further insight into the role of character strength and virtues to the topic of coping with stressors in student life.

As suggested earlier the character virtue of courage is expected to relate towards problem-focused coping (Tedeschi & Calhoun, 2004). This expectation can be further supported by the present study. Students possessing higher levels of courage tend to react bravely when faced with problematic situations (Lavy & Littman-Ovadia, 2011). They further act overly enthusiastic and energetic which allows them to actively deal and solve problematic situations

instead of withdrawing from the situation and acting in more maladaptive ways of coping like illicit drug use (Peterson, Park & Seligman, 2006).

The virtue of wisdom encompassed the opportunity for students to explore new ways and more effective ways to cope with their stressors (Marques, Pais-Ribeiro & Lopez, 2011). Instead of being overwhelmed by the negativity of a situation, students act more creatively in dealing with problematic situations, which further support the use of more adaptive and positive ways of coping (Baker & Berenbaum, 2007). Individuals scoring high on wisdom are more prone to find novel ideas, accumulate new knowledge and acquire this knowledge to completely interact with the world (Avey, Luthans, Hannah, Sweetman & Peterson, 2012). Those strengths can be used to handle stressful situations especially in academic environments more effectively (Gustems-Carnicer & Calderón, 2015).

Acting in more adaptive coping strategies is further supported by character strengths like self-control and mercy. Those character strengths summarized by the virtue of temperance indicate that those students would rather not engage in maladaptive coping strategies like denial and drug use since they know how to control themselves (Herman & Tetrick, 2009).

Further support for character virtues being the predictor of more adaptive ways of coping brings the virtue of transcendence, students scoring high in this domain tend to not focus on the negative side of a situation but rather appreciating the beauty around them and focusing more on the positive side of life (Martinez-Marti, Hernandez-Lloreda & Avia, 2016). In other words, students engaging stressful situations more actively, hopeful, enthusiastic whilst controlling their behaviour and seeking for new creative ways of dealing with those stressors appear to use adaptive coping strategies like problem-focused coping (Gustems-Carnicer & Calderón, 2015).

The present study indicates a link between virtue justice and problem-focused coping. Individuals engaging in higher levels of justice are more effective leaders which subsequently enables them to enact in more successful teamwork. Working effectively together in teams can help to dissolve problematic situations. Actively engaging in stressful situations with the use of effective teamwork further supports the relationship between justice and problem-focused coping (Niemic, 2013). As suggested by Sumner-Armstrong and colleagues (2008) does the use of

justice and effective leadership leads an individual to higher behavioural flexibility, which in turn enables the use of more behavioural and adaptive ways of coping.

The virtue of humanity has also been shown to be positively related towards PFC. As described by the study of Hutcherson, Seppala and Gross (2008) indicate higher levels of humanity, more mindfulness and positive approach towards social situations. Humanity also encompasses the strength of social intelligence, which can be used to solve social problems more actively and effectively (Niemic, 2013). Those findings suggest that humanity is more concerned with adaptive and problem-focused coping in social situations.

Interestingly emotion-focused coping was the only variable that had a positive relationship towards perceived stress. Those findings support the negative properties of EFC when confronted with stressful situations (Pritchard et al., 2007, Brougham, Zail, Mendoza & Miller, 2009). One strategy of EFC is the emotional withdrawal from a stressful encounter, this strategy can be labelled as maladaptive coping and is linked to higher levels of perceived stress (Delongis & Gruen, 1986). Moreover, the study of Lavy and Littman-Ovadia (2011) suggested a relationship between the character virtues of humanity and justice on emotion-focused coping. The present study can not confirm those findings. An explanation of their contradictory findings could be the positive aspects of EFC. As explained in the introduction can neither of both coping strategies be labelled as solely positive or negative, since the interpretation of the stressful encounter and the individual strength have also an impact if coping is effective (Folkman et al., 1986). Besides the point of individual differences in strength and interpretation, encompass EFC strategies like positive reframing and seeking social support (Baker & Berenbaum, 2007). Those strategies can be labelled as positive and adaptive which could be an explanation for the finding of Lavy and Littman-Ovadia (2011).

Limitations

Several limitations might have altered the results found in this study. At first, the whole study was conducted in one coherent questionnaire including more than 100 items that needed to be read with caution and answered honestly. According to the time it took some participants to

complete the questionnaire it appears that some needed more than 30 minutes. The time needed to complete the questionnaire could affect the motivation of participants. A loss of motivation could have caused the results to be imprecise and could have led to straight-line responding (Herzog & Bakerman, 1981). Secondly, also considering the motivation and attention of the participants, might be the influence of the corona crisis. During the corona crisis, most people had other concerns, like paying bills or housing matters, which could have influenced the way participants perceived the questionnaire. Thirdly, the questionnaire consisted solely of self-reported data, which was shown throughout literature to be biased and imprecise. An example of self-reported data bias is the phenomenon of social desirability bias, indicating that participants want to display themselves as healthy individuals (Gorber & Trembley, 2010; Rosenman, Tennekoon & Hill, 2011). This bias could have especially impacted the CSSS, in which students could have displayed themselves as less stressed, explaining the rather average levels of stress found within the present study. Fourthly, the generalizability of the questionnaire might also be biased, since most participants were of German nationality. German students find themselves in a different setting, like studying in a different country with a variety of other nationalities. This could have affected the stress levels of those students compared to students studying in their native country.

Future research

Even though the research question was not answered to the full extent, the results additionally open up interesting opportunities for future research. First of all, one could aim for more distinct results by increasing the motivation and concentration of the participants. This can, for example, be done by dividing the questionnaire into two separate ones. Those two questionnaires can be done at two different points in time, resulting in a reduced workload compared to a single-session questionnaire (Herzog & Bachman, 1981). According to the generalizability of the study, one could suggest for future research to assess the questionnaire at different universities or even different populations, it means to create more variety of recorded responses. Furthermore, future research could redo the present study with a more stressed

sample, those results could give further support or even more insights into the relationship of character strength and perceived stress. Additionally, might it be of interest to investigate sex differences and how they might influence the relationship of character strength, coping strategies and perceived stress. The influence of sex differences has been investigated within the context of problem and emotion-focused coping but not in relationship towards character strength (Brougham, Zail, Mendoza & Miller, 2009). Furthermore, could future research investigate the relationship of single character virtues and strengths on coping strategies in more detail. As discussed earlier the study of Lavy and Littman-Ovadia (2011) found contradictory results concerning the virtues of humanity and justice, those results indicate that these virtues are not solely relatable to one kind of coping strategy but rather to both problem-focused and emotion-focused coping. Therefore, a more detailed study including the virtues justice and humanity and their implemented character strength could give more insights into the relationship between character virtues and adaptive coping strategies.

Conclusion

Concluding on the results presented, a mediating effect of problem-focused coping on the relationship between character virtues and perceived stress in a student sample was not confirmed. Despite the fact that the research question could not be answered to a full extent the presented results indicate strong support for the positive association of character virtues towards an adaptive and more positive way of coping with stressful situations. Therefore, students scoring high on character virtues are more prone to tackle their problems directly and actively participate in finding new solutions to solve those, instead of withdrawing from the situation and engaging in maladaptive coping strategies. Those results show the importance of fostering character strength and virtues in students in order to give them further assistance in dealing with stressful situations they might encounter during their time at college.

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Appendices

Appendix A: Character Virtues and Strengths

Virtues

Character Strength

Wisdom

Creativity (thinking of novel and productive ways to do things)

Curiosity (taking an interest in all ongoing experience)

Perspective (understanding the world, wise counsel to others)

Judgement (weighing all evidence fairly)

Love of Learning (mastering new skills and knowledge)

Courage

Perseverance (completing tasks one starts)

Bravery (not shrinking from threat or difficulty)

Honesty (presenting oneself in a genuine way)

Zest (approaching life with excitement)

Humanity

Social Intelligence (understanding social world)

Kindness (helping and taking care of others)

Love (valuing close relations with others)

Justice

Leadership (organizing group activity)

Fairness (treating everyone fairly and justly)

Teamwork (being a good team member)

Temperance

Forgiveness

Self-Regulation (Regulating feelings and actions)

Prudence (being careful about one's choices)

Humility (not overvaluing oneself)

Transcendence

Spirituality (beliefs about purpose and meaning)

Appreciation of beauty (awareness of excellence)

Hope (expecting the best in the future)

Gratitude (thankfulness for good things)

Humor (seeing light side of life)

Note. description of character strength and virtues are derived from Peterson and Seligman (2004)

Appendix B:Consent Form

Dear participant,

Thanks for participating in our online survey!

This research aims at finding out more about the relation between personal character strengths, stress, coping and life satisfaction. Please answer the questions as honestly as possible. There is no right or wrong answer. The survey will take a maximum of 15 minutes.

Your participation in this study is entirely voluntary and you can withdraw at any time. Your answers in this study will remain confidential. We will minimize any risks by only making the data obtained available to the researcher and for research purposes only. The participants will be anonymised and no personal data will be used.

If you have any questions, feel free to send an email to l.n.wiepking@student.utwente.nl .

Thank you for your contribution to our bachelor thesis! :)

Appendix C: Questionnaire

VIA-IS 72

- The following questionnaire concerns your personal character strengths. Please choose one option in response to each statement. Many of the questions reflect statements that many people would find desirable, but we want you to answer only in terms of whether the statement describes what you are like. Please be honest and accurate.

	Very much unlike me	Unlike me	Neutral	Like me	Very much like me
I have taken frequent stands in the face of strong opposition.					
I never quit a task before it is done.					
I always keep my promises.					
I always look on the bright side.					
I am a spiritual person.					
I know how to handle myself in different social situations.					
I always finish what I start.	Very much unlike me	Unlike me	Neutral	Like me	Very much like me

I really enjoy doing small favors for friends.

As a leader, I treat everyone equally well regardless of his or her experience.

Even when candy or cookies are under my nose, I never overeat.

I practice my religion.

I rarely hold a grudge.

I am always busy with something interesting.

No matter what the situation, I am able to fit in.

Very much
unlike me

Unlike me

Neutral

Like me

Very much
like me

I go out of my way to cheer up people who appear down.

One of my strengths is helping a group of people work well together even when they have their differences.

I am a highly disciplined person.

I experience deep emotions when I see beautiful things.

Despite challenges, I always remain hopeful about the future.

I must stand up for what I believe even if there are negative results.

I finish things despite obstacles in the way.

Very much
unlike me

Unlike me

Neutral

Like me

Very much
like me

Everyone's rights are equally important to me.

I see beauty that other people pass by without noticing.

I never brag about my accomplishments.

I am excited by many different activities.

I am a true life-long learner.

I am always coming up with new ways to do things.

People describe me as "wise beyond my years."

Very much
unlike me

Unlike me

Neutral

Like me

Very much
like me

My promises can be trusted.

I give everyone a chance.

To be an effective leader, I treat everyone the same.

I am an extremely grateful person.

	Very much unlike me	Unlike me	Neutral	Like me	Very much like me
I try to add some humor to whatever I do.					
I look forward to each new day.					
I believe it is best to forgive and forget.					
My friends say that I have lots of new and different ideas.					
I always stand up for my beliefs.					
I am true to my own values.					
I always feel the presence of love in my life.					
I can always stay on a diet.					
	Very much unlike me	Unlike me	Neutral	Like me	Very much like me

I think through the consequences every time before I act.

I am always aware of the natural beauty in the environment.

My faith makes me who I am.

I have lots of energy.

I can find something of interest in any situation.

I read all of the time.

Thinking things through is part of who I am.

I am an original thinker.

Very much
unlike me

Unlike me

Neutral

Like me

Very much
like me

I have a mature view on life.

I can express love to someone else.

Without exception, I support my teammates or fellow group members.

I feel thankful for what I have received in life.

I know that I will succeed with the goals I set for myself.

I rarely call attention to myself.

I have a great sense of humor.

I always weigh the pro's and con's.

Very much
unlike me

Unlike me

Neutral

Like me

Very much
like me

I enjoy being kind to others.

I can accept love from others.

Even if I disagree with them, I always respect the leaders of my group.

I am a very careful person.

I have been told that modesty is one of my most notable characteristics.

I am usually willing to give someone another chance.

I read a huge variety of books.

I try to have good reasons for my important decisions.

Very much
unlike me

Unlike me

Neutral

Like me

Very much
like me

I always know what to say to make people feel good.

It is important to me to respect decisions made by my group.

I always make careful choices.

I feel a profound sense of appreciation every day.

I awaken with a sense of excitement about the day's possibilities.

Others consider me to be a wise person.

I believe that it is worth listening to everyone's opinions.

I am known for my good sense of humor.

CSI-SF

Take a few moments and think about an event or situation that has been very stressful for you during the last month because it made you feel bad or because it took effort to deal with it.

Considering this event, how do you usually deal with these kinds of situations?

	Never	Rarely	Sometimes	Often	Almost always
I make a plan of action and follow it					
I look for the silver lining or try to look on the bright side of things					
I try to spend time alone					
I hope the problem will take care of itself					
I try to let my emotions out					
I try to talk about it with a friend or family					
	Never	Rarely	Sometimes	Often	Almost always
I try to put the problem out of my mind					
I tackle the problem head-on					
I step back from the situation and try to put things into perspective					
I tend to blame myself					
I let my feelings out to reduce the stress					
I hope for a miracle					

	Never	Rarely	Sometimes	Often	Almost always
I ask a close friend or relative that I respect for help or advice					
I try not to think about the problem					
I tend to criticize myself					
I keep my thoughts and feelings to myself					

CSSS

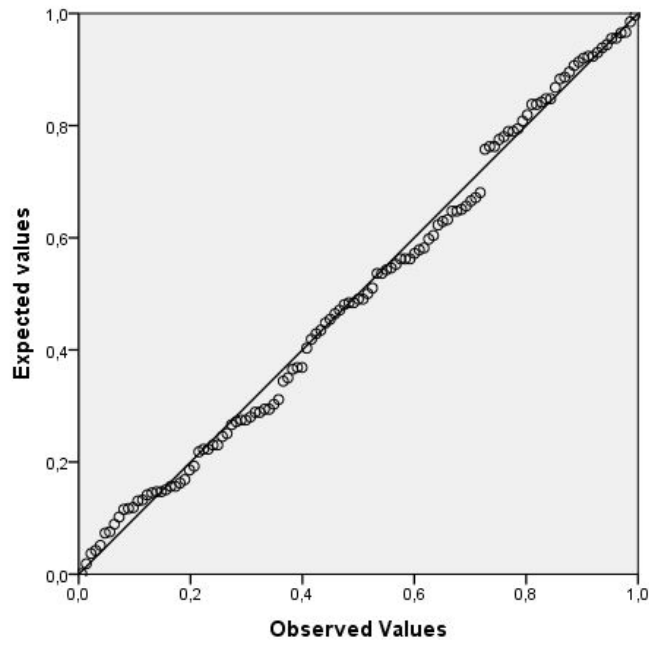
For the following items, report how often each has occurred this semester using the following scale.

	Never	Rarely	Sometimes	Often	Almost Always
Felt anxious or distressed about personal relationships					
Felt anxious or distressed about family matters					
Felt anxious or distressed about financial matters					
Felt anxious or distressed about academic matters					

	Never	Rarely	Sometimes	Often	Almost Always
Felt anxious or distressed about housing matters					
Felt anxious or distressed about being away from home					
Questioned your ability to handle difficulties in your life					
Questioned your ability to attain your personal goals					
	Never	Rarely	Sometimes	Often	Almost Always
Felt anxious or distressed because events were not going as planned					
Felt as though you were NO longer in control of your life					
Felt overwhelmed by difficulties					

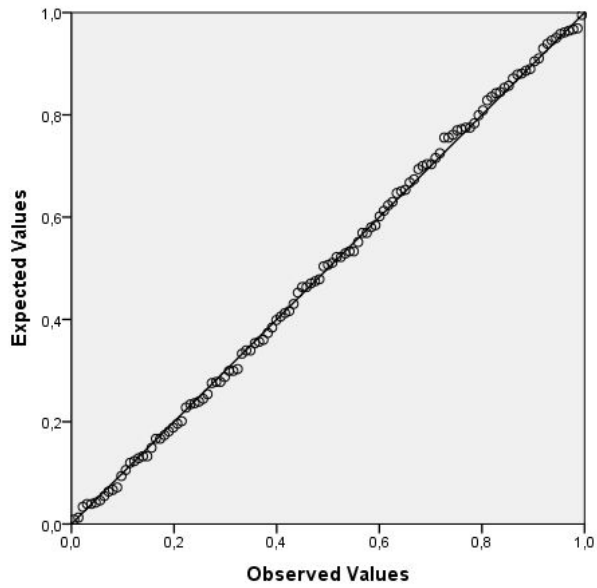
Appendix D: Residual Plots

Figure 2. Standardized Residual Plot of Regression involving character virtue Courage



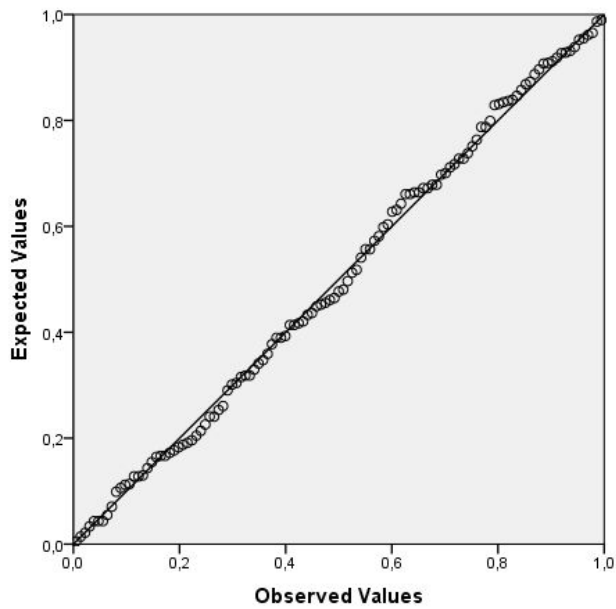
Note. dependent variable: Problem-Focused Coping

Figure 3. Standardized Residual Plot of Regression involving Character virtue Transcendence



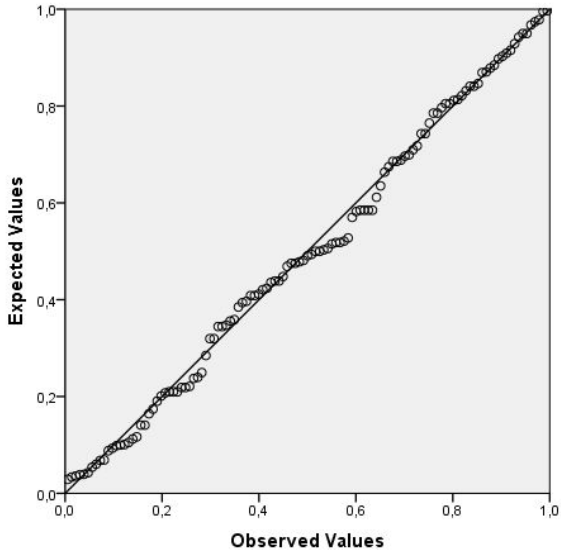
Note. Dependent Variable: Problem-Focused Coping.

Figure 4. Standardized Residual Plot of Regression involving character virtue Temperance



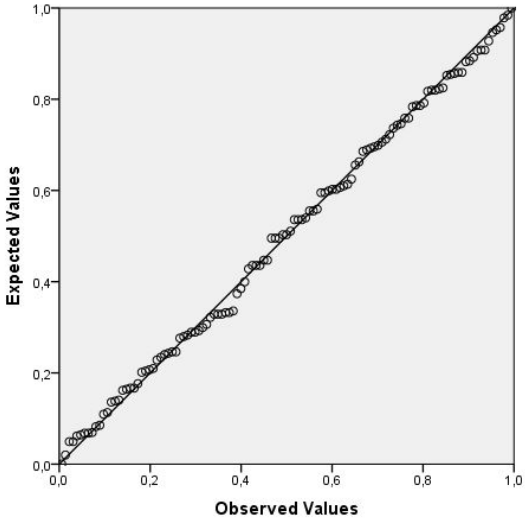
Note. Dependent Variable: Problem-Focused Coping.

Figure 5. Standardized Residual Plot of Regression involving character virtue Justice



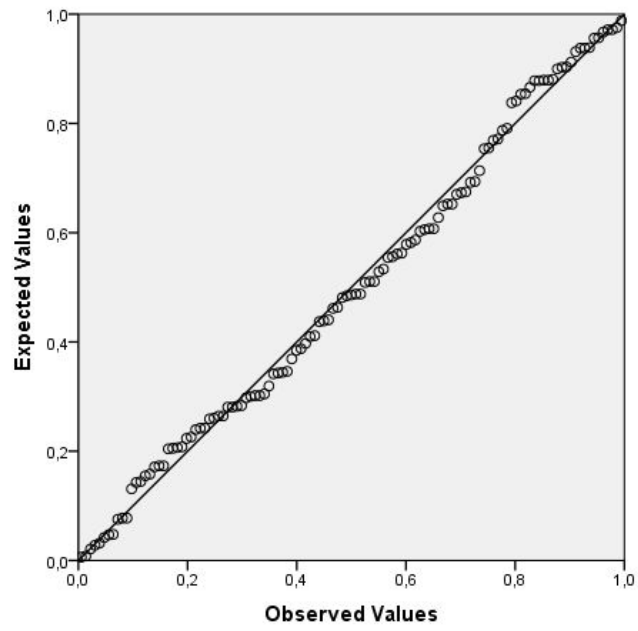
Note. Dependent-Variable: Problem-Focused Coping

Figure 6. Standardized Residual Plot of Regression involving character virtue Humanity



Note. Dependent Variable: Problem-Focused Coping.

Figure 7. Standardized Residual Plot of Regression involving Character Virtue Wisdom



Note. Dependent Variable: Problem-Focused Coping.