Relationship between character strengths and lower levels of college-related stress and test anxiety

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Abstract

Background: College-related stress is increasingly observed at campuses, but also test anxiety is common among university students. Both issues are related as a major predictor for college-related stress is test anxiety. However, positive psychology interventions using character strengths showed to help students to deal with such problems. Character strengths are positive trait-like characteristics beneficial for the individual and can be classified into overarching virtues. This study aimed to explore the relationship between character strength and the two individual variables college-related stress as well as test anxiety. First, it was assessed to what extent character strengths are related to perceived college-related stress and test anxiety. Further, it is investigated which specific strengths and virtues are related to lower levels of perceived college-related stress and test anxiety. Finally, it was investigated to what extent gender had a moderating effect on the proposed relationship between character virtues and perceived college-related stress as well as test anxiety.

Method: A quantitative cross-sectional correlational survey with 107 items using self-reported data for character strengths, college-related stress and test anxiety was shared with university students through convenience sampling. The sample consisted of 73 university students, resulting in a sample mainly consisting of female (67%), German (82%) students. Research questions were answered using correlation, multiple simple linear regressions and moderation analyses.

Results: In general, few strengths were found to be significantly related towards college-related stress and test anxiety. Especially higher levels of the strengths related to the virtue of transcendence, particularly hope, seemed to predict and correlated with lower levels of college-related stress and test anxiety. Higher levels of perspective showed not only to correlate with test anxiety but also predicted lower levels test anxiety. Additionally, the only moderating effect of gender was found on the relationship between the virtue transcendence and test anxiety.

Conclusion: Several recommendations for future research, are given towards the homogenous sample, measurement technique and research on the over- and underuse of strengths. Results should be generalized with caution due to limitations potentially altering the results.

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Introduction

The emergence of research in the field of positive psychology in the late 1990s was rooted as a counterpart to the traditional approach in psychology, aiming to improve the mental health of individuals by focussing on positive emotions and strength use (Magyar-Moe, 2009b). From the positive psychology view, humans possess besides destructive forces and weaknesses also opportunities and strengths, also known as the four-front approach. In a clinical approach towards psychology, these four factors are commonly overlooked (Wright & Lopez, 2002). Further, positive psychology deals mainly with the positive institutions, meaning the surrounding one lives in; the positive subjective experiences, such as satisfaction and happiness and finally, positive individual traits, such as character strengths (Seligman & Csikszentmihalyi, 2000). Character strengths can be defined as positive trait-like characteristics of the personality, benefitting the individual possessing them, such as creativity, humour or fairness (Peterson & Seligman, 2004). They function, among other factors, as internal determinants for a satisfactory and delighted life and are manifested in cognition and behaviour (Peterson, 2006; Weber, Wagner, & Ruch, 2014). Besides that, the exploration of character strengths and subsequently using them in everyday life of the people can be applied in many areas like education, work and family to name a few (Huber et al., 2019). They are used for instance in therapy sessions, complementing the clinical approach by not only focusing on the shortcomings of the client (Magyar-Moe, 2009a). Peterson and Seligman (2004) state that character strengths function as a buffer for psychopathological symptoms such as anxiety or depression, which consequently affect the mental well-being of individuals and have been related with higher life-satisfaction (Peterson 2006; Huber et al., 2019).

Multiple strength finders were developed since the emergence of positive psychology, measuring unique sets of strengths or talents of the user's character displayed in the cognitions and behaviour of individuals (Magyar-Moe, 2009a). Previous research with strength-based intervention revealed various positive outcomes of strength awareness and usage, which can be identified and nurtured with the help of characters strength finders (Peterson, 2006). For instance, strength-based interventions among college student samples already displayed effectiveness and benefits when counteracting mental health issues such as stress, depression and anxiety by identification, exploration and subsequent training of application (Duan, 2016; Duan & Bu, 2017).

Further, imbalanced strength use (under- and overuse) is a topic to be considered when investigating drawbacks of character strengths. Research on the relationship between strength overuse and psychopathologies such as depression and obsessive-compulsive disorders showed to be related, depending on the applicable strength and situation (Littman-Ovadia & Freidlin, 2019). Niemec (2019) stresses the importance of finding the just-right balance for each strength in each individual and that possessing more strengths or higher levels of strengths does not automatically mean benefits for mental health.

College-related stress

The prevalence of college-related stress among college students has already been demonstrated in various studies. The research of Schlarb, Claßen, Grünwald and Vögele (2017) on German and Luxembourgian college students showed that 45% of the sample reported elevated levels of stress. Especially stress in female students has been identified as higher when compared to the male group. This is not only true for females in the student population, but also in the general population, it can be observed that women have more psychological disorders (Schlarb et al., 2017; Saleh, Camart, & Romo, 2017). Although stress can be seen as a challenge promoting the academic efforts in a beneficial way, it can result in inhibited performance. Further, heightened levels of college-related stress are increasingly observed on global campuses (Breiter et al., 2015; Duan & Bu, 2017). College-related stress is characterized by a disrupted balance of the regular circumstances or general well-being by academic and private life challenges (Breiter et al.,2017; Schlarb et al, 2017). As a consequence of higher college-related stress and the incapacity to deal with these issues, college students commonly reported higher levels of depression and anxiety, lower satisfaction with life and also poorer adjustment to their college environment (Duan & Bu, 2017). According to Duan (2016) and Beiter et al. (2015), especially plans for the time after graduation, financial issues, the pressure for academic success, and the amount of materials to study are related to perceived college-related stress. Further, Fisher (1994) described that one major predictor for college-related stress is test anxiety.

Test anxiety

Tests seem to make students more vulnerability to higher levels of test anxiety, subsequently reducing the own confidence. Decreased confidence and the perception of a poor performance lead to elevated levels of college-related stress and might become self-

fulfilling. Although both problems are closely related, they are not synonymous (Fisher, 1994). Previous studies already found moderate positive correlations between college-related stress and test anxiety (Feldt & Koch, 2011). Szafranski, Barrera, and Norton (2012) describe that prior studies indicated between 10% and 35% of European college students reported test anxiety during their studies, while females indicated higher scores of approximately ten per cent (Feldt & Updegraff, 2013). An investigation by the German 'Bundesministerium für Bildung und Forschung' [Federal Ministry of Education and Research] (2007) concluded that 13% of the participating students suffer test anxiety. Variation of test anxiety scores might be due to inconsistent methods quantifying test anxiety or institutional differences (Gerwing, Rash, Gerwing, Bramble, & Landine, 2015).

Test anxiety can be conceptualized as the associated apprehensive state associated with evaluative situations such as tests (Gerwing et al., 2015). According to Spielberger (2010) and Lowe et al. (2007) consequences of test anxiety can be decreased performance in examination situations. Low self-esteem and fear of failure are related to higher levels of test anxiety (Hembree, 1988). Two dimensions are considered when investigating test anxiety. Worry is associated with behaviours and beliefs leading to evaluations of the current situation, potentially leading to a sub-optimal performance in the examination situation by distracting the preparation and execution. Emotionality is commonly recognized as heightened arousal and corresponding physiological responses, such as headaches (Spielberger, 2010).

Relationship between character strengths, college-related stress and test anxiety

Character strengths and college-related stress

Individuals with higher levels of strengths belonging to the virtues of wisdom and knowledge, temperance and humanity, seemed to perceive less stress than individuals with lower levels of strengths in these strength areas (Duan, 2016). It was concluded that character strengths might function as a buffer against the perceived college-related stress. In situations of lower stress, these strengths have rather a maintaining function and in stressful periods they enhance the well-being and subsequently lower symptoms such as the perceived stress (Duan, 2016; Peterson & Seligman, 2004). Individuals possessing higher levels of the strength social intelligence was explained to be related to lower college-related stress as these individuals are more likely to reach out towards their social context in stressful circumstances to cope with the stress. It is further argued, that especially the temperance and wisdom virtues

are related to more effective problem-solving behaviour as well as a more enthusiastic approach to tasks associated with the source of stress (Gustems-Carnicer & Calderón, 2015).

Character strengths and test anxiety

From previous research, it is known that character strengths correlate with higher positive affect and lower negative affect, to which test anxiety can be accounted, in academic settings (Weber et al., 2014). However, rather less is known about the general relationship between character virtues and test anxiety but more about specific character strengths. In particular the strengths hope and self-regulation have been associated with lower levels of test anxiety as they seem to be protective factors against negative affect perceived through test anxiety (Kossakowska-Pisarek, 2016; Weber et al., 2014). Students perceiving higher levels of hope are likely to expect success in their test, while pessimism about the own competence and success is associated with test anxiety (Kossakowska-Pisarek, 2016; Pekrun et al., 2004). These findings are in line with the claim of Peterson and Seligman (2004) that character strengths can help to buffer anxiety by providing protection to the perceived negative affect.

Moderating effect of gender

Previous research already established that character strengths are differently distributed across genders. Females commonly possess more strengths of humanity, such as kindness, but also strengths belonging to transcendence, such as gratitude, while males score higher on the strengths perspective, curiosity and self-regulation (Duan & Bu, 2017). As described above, strengths of humanity, temperance and intellectual strengths, seem to be related towards lower college-related stress, subsequently, students suffer less of the associated issues (Duan, 2016). However, not much research was done yet on the moderating effect of gender on the relationship between character virtues and college-related stress as well as test anxiety. Therefore, the current research will aim to examine gender as a moderator on the relationship between character virtues and college-related stress and test anxiety.

Current research and research question

The current research aims to investigate the firstly the associations between character strengths and college-related stress and secondly the associations of character strengths and

test anxiety in students. College students were chosen as the target group as they are most likely to suffer college-related stress and test anxiety but also for convenience reasons as they are accessible and also exceed the age of 18 years. To gain more insight into these associations, the following research questions were formulated.

College-related stress

Research question 1a: To what extent are character strengths related to perceived college-related stress?

Research question 1b: Which specific virtues and character strengths are related to lower levels of perceived college-related stress?

Research question 1c: How much does gender moderate the relationship between the six individual virtues of character strength and perceived college-related stress? (As seen in Figure 1)

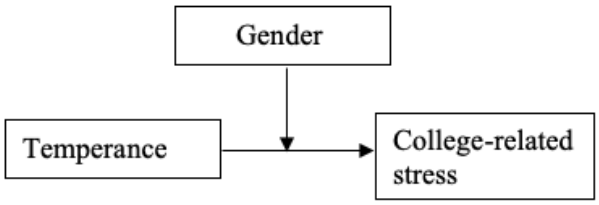

Figure 1.

Proposed moderation model with character virtues (temperance given as an example) as predictor variable, college-related stress as outcome variable and gender as moderator.

Test Anxiety

Research question 2a: To what extent are character strengths related to perceived test anxiety?

Research question 2b: Which specific virtues and character strengths are related to lower levels of perceived test anxiety?

Research question 2c: How much does gender moderate the relationship between the six individual virtues of character strength and perceived test anxiety? (As seen in Figure 2)

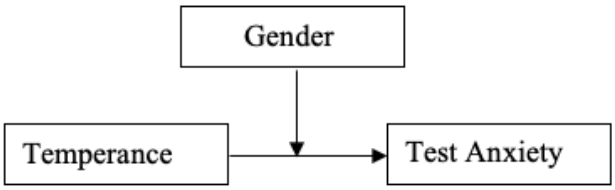

Figure 2.
Proposed moderation model with character virtues (temperance given as an example) as predictor variable, test anxiety as outcome variable and gender as moderator.

Method

Design

This research was a non-experimental, quantitative cross-sectional correlational survey.

Participants

This study included a sample size of 73 students with an age range from 18 until 31 with a mean of 21 years (M= 21.0; SD= 1.9). Further details can be found in Table 1 below. Most participants reported that their nationality is German (82.2%), other nationalities included Dutch (9.6%), Romanian and Indonesian. Further one participant also reported to belong to the Persian ethnicity. Furthermore, the majority of participants were in their third study year. For their participation, the students signing up in SONA received 0.25 credits.

Table 1.

Sample characteristics (N=73)

	N (%)
Gender	
Male	23 (31.5)
Female	49 (67.1)
Other	1 (1.4)
Nationality	
German	60 (82.2)
Dutch	7 (9.6)
Other	6 (8.2)
Study Year	
First Bachelor Year	22 (30.1)
Second Bachelor Year	19 (26.0)
Third Bachelor Year	30 (41.1)
First Master Year	-
Second Master Year	2 (2.7)

Materials

The online questionnaire was created by using the software 'Qualtrics' with a total number of 107 items in four item categories. The entire questionnaire was in English and the following materials were used.

Item category one: Demographic questions

Age, gender, nationality and the current study year were assessed in the first item category. The age, as well as the nationality, had to be typed in manually by the participant. The gender and the current study year were answered by clicking checkboxes, respectively three for the gender (male, female and other) as well as six options for the study year (first- through third-year bachelor student, first- or second-year master student and graduated).

Item category two: College Student Stress Scale (CSSS)

The second item category consisted of the eleven questions of the CSSS (Feldt, 2008) and was posed to assess the stressors the participants encounter in their student life. The questions were posed as statements on which the participants could answer by indicating their

agreement on a 5-point Likert scale ranging from 'Never' to 'Very often', therefore a score between 11 and 55 points were possible, where higher scores indicate higher college-related stress. An example of a question in this item category was whether students 'Felt anxious or distressed because events were not going as planned' during the past semester. Other issues assessed by this questionnaire are also including family, housing and financial matters for instance. The internal consistency of the CSSS in the current study was good with a Cronbach's α of .84, only one item (Item 3) showed a corrected item-total correlation below 0.3. However, if this item was deleted, Cronbach's α would have only increased by 0.009, therefore all items remained. The reliability coefficient is comparable to findings of other researchers, using this scale on a college student population which had comparable reliability of 0.81 and a two-factor solution towards the validity (Feldt & Koch, 2011). The entire questionnaire can be found in Appendix A.

Item category three: Test Anxiety Inventory (TAI)

The TAI (Spielberger et al., 1980) formed the third item category and was posed to measure the emotionality and worry dimension of test anxiety. This item category consisted of 20 items and is rated through a 4-point Likert-scale ranging from 'Almost never' to 'Almost always'. Possible scores could be between 20 and 40, where again higher scores indicated higher test anxiety. Worry and emotionality specifically are assessed by eight items each, therefore, scores could lie between 8 and 32. An example of an item of the emotionality dimension is 'Even when I'm well prepared for a test, I feel very nervous about it.'. An example item of the worry dimension is 'During examinations I get so nervous that I forget facts I really know.' The entire questionnaire can be found in Appendix B. The internal consistency of the TAI in the current study was good, with a Cronbach's α of .96. No item had a corrected-item total correlation below 0.3, therefore, no exclusion of items was considered. This score is comparable to observations other researchers made Taylor and Deane (2002) who found a value of 0.93. Further, the TAI was already used on college undergraduate students (Szafranski et al., 2012). Previous studies showed that the discriminant validity, so to distinguish high- and low-test anxiety in students is sufficiently high to do so (Thyer & Papsdorf, 1982). Additionally, it showed that it possesses good convergent validity with other scales assessing the test anxiety (Szafranski et al., 2012) and a factor structure of two dimensions was reported (Everson, Millsap, & Rodriguez, 1991).

Item category four: Character strength finder Values in Action (VIA-72)

The final item category consisted of 72 questions composing the character strength finder VIA-72 (Peterson & Seligman, 2004) and aimed to measure the character strength of the participating students. The VIA-72 assesses the subjective perception regarding six character virtues by measuring character strengths through three items for each strength. The items are rated by the participant through a 4-point Likert scale, ranging from 'Very Much Unlike Me' to 'Exactly Like Me'. One example of an item is 'Despite challenges, I always remain hopeful about the future.' This item belongs to the trait of hope within the virtue category of transcendence. The entire questionnaire can be found in Appendix C and the overarching virtues can be found in Table 8 in Appendix D. Internal reliability of the VIA-72 in the current study was also good with a Cronbach's α of .86. Few items had a corrected-item total correlation below 0.3, however excluding them would have had a low benefit to increase Cronbach's α by 0.002 and since the shortened VIA Inventory of Strengths (VIA-IS) form was chosen, and therefore only three items to indicate a strength, exclusion of strengths was disregarded. Similar findings regarding the reliability were made by the VIA Institute (n.d.-b) with the strengths reaching values between .60 and .87 and a reliability coefficient of .75 on average. Further, it was already tested on college student samples (Lounsbury, Fisher, Levy, & Welsh, 2009). Research on the validity of the VIA-72, suggest that a four-factor solution might be the most suitable explanation (Macdonald, Bore & Munro, 2008; VIA Institute, n.d.-b).

Procedure

Before distributing the questionnaire, it was approved by the ethics committee of the Faculty 'Behavioural, Management and Social Sciences' (BMS) of the University of Twente (Request number 200403). The questionnaire was created in the software programme Qualtrics and then shared, it was available for a period of four weeks, from 26.3.2020 until the 23.4.2020. Two sampling methods were used to recruit participants. Firstly, through convenience sampling where the researcher contacted acquaintances via WhatsApp by providing a link to the survey. Secondly, undergraduate students were recruited through the university's internal recruitment system SONA. To be included in the study, participants had to be students and had to be 18 years old or older. When the participants clicked on the study link, they first received an introductory text (Appendix E), which firstly explained the purpose of the study, then explained the procedure and that there are no right or wrong

answers, since this questionnaire was about the personal perception. Finally, an informed consent (Appendix E) was provided, on which the participants had to agree to continue to the questions. Then participants answered the items from the four item categories, namely demographic questions, the CSSS, the TAI, and the VIA-72 assessment. The items of the VIA-72 were presented in a randomized manner towards the participants. Aim of this decision was to avoid that participants respond with a specific pattern towards a virtue. After answering all the questions, the researcher thanked again for participation and left contact details for the case of upcoming questions. On average, participants needed 12 minutes to fill in the questionnaire.

Data analysis

The first step of the data analysis was to remove unnecessary variables such as the day of participation. Afterwards, the raw dataset was screened for missing values, such as unfinished responses, those who did not meet the inclusion criteria (below the age of 18, having already graduated) and were deleted manually from the dataset which subsequently lowered the total number of participants from 80 to 73 participants.

The next step was the calculation of descriptives of demographics such as age, nationality, gender and the study year to gain an overview how the sample was distributed, while the nationality variable had to be recoded. All items of the CSSS were recoded. All items of the TAI, except the first one, had to be recoded, as this asked for the perceived confidence during test taking. This measured the opposite of all other questions. Finally, variables were computed together and formed a total score per questionnaire and were used as dependent variables, with which additional descriptives for CSSS and TAI were calculated. The three questions of the VIA for each character strength were first calculated together into strength variables and virtue variables and subsequently used as independent variables. The respective minimum and maximum score possible, as well as mean and standard deviations, can be found in the 'Materials' section under the appropriate item category description. In the next step, the reliability was assessed using Cronbach's α, therefore items had to exceed an item-intercorrelation of 0.3. The items would have been excluded if their removal would have had to contribute to a significantly better Cronbach's α (Field, 2013). If this was not the case, the items were excluded from further analyses.

Before starting with the analysis for the respective research questions, the dataset had to be checked for basic assumptions. For research question 1a and 2a, which asked to what

extent character strengths are related to perceived college-related stress and test anxiety respectively, correlation analyses were conducted. If the normality assumption was met, a 1-tailed Pearson's correlation was conducted. For the case that variables were not normally distributed, a Spearman's correlation would have been conducted. Therefore, some basic assumptions had to be met. Interval variables were used as outcome and predictor variable as required. Further, linearity was checked though the investigation of scatterplots. Finally, normality was checked through investigating the skewness and kurtosis, which had to lie between -2 and +2 (George & Mallery, 2010). P-values below .05 were accepted to be significant. Correlation coefficients until .29 were considered as weak, until .59 moderate and between .60 and 1 as strong (Schober, Boer, & Schwarte, 2018).

Research question 1b and 2b aimed to investigate which specific virtues and character strengths are related to lower levels of perceived college-related stress and test anxiety respectively. To answer the research question, multiple simple linear regressions had to be employed. Therefore, the four basic assumptions had to be satisfied. Normality of the dataset was again checked by investigating the skewness and kurtosis of the dataset and if values were within a range of -2 and +2 (George & Mallery, 2010). Linearity was also checked through investigating plots. Homoscedasticity was checked by plotting residuals against the predicted values and investigation of this plot. Existing outliers would then have to be removed to avoid skewness of the results. Finally, independence was investigated through creating a coefficient table and investigating the VIF values which had to be below ten (Field, 2013). P-values below .05 were accepted as significant.

For research question 1c and 2c, moderation analysis was used to investigate how much the gender moderates the relationship between the six individual virtues of character strengths and perceived college-related stress as well as test anxiety. The 'Process' tool by Hayes (2013) for SPSS (Version 3.5) was used for the moderation analysis. Therefore, the same assumptions as for the linear regressions had to be met and checked as described above. As outliers had to be excluded, the only participant who indicated the gender with 'other' had to be excluded, since one measure is not sufficient to explain this gender. Moderation was considered to be significant if the p-value of the interaction effect between the gender and the strength was below .05.

Results

Descriptive statistics

On the CSSS, female participants scored a bit higher in comparison to male participants. The average score on the CSSS was comparable to findings of Feldt, Graham, and Dew (2011). Also, on the TAI, female participants scored a bit higher when compared to the male participants. The average score on the TAI, as well as the small gender differences on the TAI and respective subscales, is comparable to findings of Everson et al. (1991). Means and standard deviations can be found in Table 2 below.

Table 2.

Descriptive statistics for college-related stress, test anxiety and the respective subscales (N=73).

	M	*SD*
College-related stress	30.52	6.72
Males	28.04	6.53
Females	31.51	6.54
Test anxiety	45.60	14.43
Males	44.08	14.76
Females	46.53	14.41
Test anxiety - worry	20.08	6.33
Test anxiety - emotionality	16.19	5.45

Note. Perceived college-related stress assessed by the CSSS. Perceived test anxiety assessed by the TAI and the respective subscales.

The distribution of all strengths and virtues can be found in Table 3 below. Overall, the virtue strengths of humanity had the highest mean, closely followed by the virtue of justice. The lowest mean was found in the virtue temperance. The strength with the highest mean was honesty, followed by kindness, fairness, judgement and humour in that exact order, spirituality had the lowest mean. The VIA Institute (n.d.-a) reports kindness, fairness, honesty, gratitude and judgement as the five most prevalent strengths. There is a high overlap between the prevalence of strengths in the samples, but not in the order. Overall, there was no larger difference observed between the total score of the character strengths between males and females. On average female participants scored higher on the strengths appreciation of excellence and beauty, fairness, gratitude, humility, kindness, love, prudence, social

intelligence, spirituality and zest. Males scored higher than females on the strengths bravery, humour, honesty, judgement and self-regulation. Findings of the current study mostly overlap with findings with observations in other college student samples (Lounsbury et al., 2009). To conclude, although females in this sample possess more strengths, the total score of both investigated genders are similar.

Table 3.

Descriptive statistics of character strengths and virtues (N=72).

	M	*SD*	Males		Females	
			M	*SD*	*M*	*SD*
Total score character strengths	2.84	.22	2.83	.23	2.88	.21
Wisdom and knowledge	2.85	.30	2.88	.31	2.83	.29
Creativity	2.79	.51	2.81	.60	2.76	.46
Curiosity	2.84	.49	2.75	.50	2.86	.48
Judgement	3.21	.51	3.35	.51	3.14	.50
Love of learning	2.60	.57	2.58	.57	2.61	.58
Perspective	2.79	.54	2.88	.37	2.76	.60
Strengths of courage	2.91	.33	2.97	.31	3.89	.34
Bravery	2.89	.52	3.06	.49	2.80	.52
Perseverance	2.73	.64	2.78	.74	2.71	.59
Honesty	3.31	.47	3.42	.48	3.24	.48
Zest	2.74	.55	2.61	.52	2.80	.56
Strengths of humanity	3.07	.41	2.92	.31	3.13	.41
Love	3.03	.61	2.81	.58	3.14	.59
Kindness	3.27	.47	3.14	.53	3.32	.43
Social intelligence	2.89	.51	2.79	.44	2.92	.53
Justice	3.06	.42	3.02	.42	3.07	.42
Teamwork	2.95	.45	2.92	.46	2.95	.45
Fairness	3.26	.55	3.12	.57	3.31	.53
Leadership	2.97	.53	3.02	.52	2.94	.54
Temperance	2.67	.39	2.63	.46	2.68	.35
Forgiveness	2.81	.55	2.81	.60	2.81	52
Humility	2.67	.55	2.43	.61	2.76	.69
Prudence	2.99	.68	2.87	.72	3.03	.68
Self-regulation	2.21	.73	2.41	.68	2.13	.75
Transcendence	2.78	.30	2.69	.28	2.82	3.31

Appreciation of excellence and beauty	2.98	.70	2.65	.84	3.11	.56
Gratitude	2.95	.43	2.74	.44	3.06	.40
Hope	2.83	.47	2.84	.37	2.83	.51
Humour	3.05	.57	3.22	.49	2.97	.58
Spirituality	2.10	.84	1.98	.80	2.14	.86

Research question 1a & 2a

To what extent are character strengths related to perceived college-related stress?

All aforementioned conditions for the correlation analysis were met. It must be kept in mind, as the values of the CSSS were flipped for further analysis, higher scores mean lower perceived stress. Significant correlations can be found in Table 4 below, all other correlations for the strengths, virtues and college-related stress can be found in Table 9 Appendix F. The correlation between the total score of the strengths and the total score of the perceived stress, was found to be non-significant. Zest, social intelligence, self-regulation, hope and humour had significant weak to moderate correlations with college-related stress. One significant, weak, negative correlation was found with the strength of appreciation of excellence and beauty. To conclude, three out of five strengths belonging to the virtue of transcendence (hope, humour and appreciation of excellence and beauty) were found to be significantly correlated with college-related stress.

Table 4.

*Significant Pearson's correlations for character strengths and college-related stress (N=*73).

	r	Sig. (1-tailed)
Total score character strengths	.156	.094
Zest	.202	.043
Social intelligence	.227	.027
Self-regulation	.253	.015
Appreciation of excellence and beauty	-.238	.021
Hope	.361	.001
Humour	.293	.006

To what extent are character strengths related to perceived test anxiety?

All aforementioned conditions for the correlation analysis were met. It must be kept in mind, as the values of the TAI were flipped for further analysis, higher scores mean lower perceived test anxiety. Significant correlations can be found in Table 5 below and all other

correlations of character strengths, virtues and test anxiety in Table 9 in Appendix F. Again, the correlation between the total score of the strengths and the total score of perceived test anxiety were found to be non-significant, same applies to the test anxiety subscales. Two weak significant positive correlations were found between the test anxiety and the specific character strengths perspective and hope. The emotionality subscale correlated significant positive with perspective and hope. Significant negative correlations were found with judgement and prudence. The worry subscale correlated significant positive with perspective.

Table 5.

*Significant Pearson's correlations for character strengths and test anxiety (N=*73).

		Total score test anxiety	TAI-Emotionality	TAI-Worry
Total score	r	-.087	-.136	-.095
character strengths	Sig. (1-tailed)	.231	.126	.212
Judgement	r	-.179	-.229	-.094
	Sig. (1-tailed)	.065	.026	.215
Perspective	r	.279	.287	.208
	Sig. (1-tailed)	.009	.007	.039
Prudence	r	-.154	-.252	-.037
	Sig. (1-tailed)	.096	.016	.376
Hope	r	.211	.224	.126
	Sig. (1-tailed)	.036	.028	.144
Spirituality	r	.228	.221	.208
	Sig. (1-tailed)	. 063	.030	.068

Note. TAI-Emotionality=Emotionality subscale of the TAI. TAI-Worry=Worry subscale of the TAI.

Research question 1b & 2b

Which specific virtues and character strengths are related to lower levels of perceived college-related stress?

All aforementioned conditions for the employment of a linear regression were met. Multiple simple linear regressions were conducted to analyse which virtues and strength predict college-related stress among the participants, significant values can be found in Table 6 below, all other values can be found in Table 10 in Appendix G. Overall, no virtue was found to be significant, meaning no virtue predicted lower levels of college-related stress well. However, five strengths were found to significantly predict lower levels of college-

related stress. These strengths are social intelligence, self-regulation, appreciation of excellence and beauty, hope and humour.

Table 6.

Significant outcomes of regression analysis between character strengths and college-related stress.

	R^2	F	p
Social intelligence	.051	3.84	.05
Self-regulation	.063	4.85	.03
Appreciation of excellence and beauty	.057	4.28	.04
Hope	.130	10.61	.01
Humour	.086	6.67	.01

Which specific virtues and character strengths are related to lower levels of perceived test anxiety?

Again, all aforementioned conditions for the employment of a linear regression were met. Multiple simple linear regressions were conducted to analyse which virtues and strength predict test anxiety among the participants, significant values can be found in Table 7 below, all other values can be found in Table 11 in Appendix G. Again, no virtue was found to be significant, meaning no virtue predicted the test anxiety well. However, two strengths were found to significantly predict lower test anxiety, namely perspective and spirituality.

Table 7.

Significant outcomes of regression analysis between character strengths and test anxiety.

	R^2	F	p
Perspective	.078	5.97	.02
Spirituality	.052	3.88	.05

Research question 1c & 2c

How much does gender moderate the relationship between the six individual virtues of character strength and perceived college-related stress?

Aforementioned assumptions for conducting a moderation analysis were only partially met, as only two virtues showed to be correlated with college-related stress. Gender did not moderate the relationship between all six virtues and college-related stress. All six

moderation analyses can be found in Table 12 in Appendix H. Further, it was found that only very small portions of variance can be explained by this interaction model.

How much does gender moderate the relationship between the six individual virtues of character strength and perceived test anxiety?

Again, the aforementioned assumptions for conducting a moderation analysis were only partially met, as none of the virtues correlated with test anxiety. The analysis showed that the only significant moderation effect of gender was on the relationship between the character virtue transcendence and perceived test anxiety. The effect size of the interaction (b= 25.69; p= .048) can be seen in Figure 3. In other words, females with lower levels of transcendence score high in test anxiety and males with lower levels of transcendence score low in test anxiety. Again, just as applicable for the college-related stress assessment, it was found that only very small portions of variance can be explained by this interaction model (Appendix H Table 13).

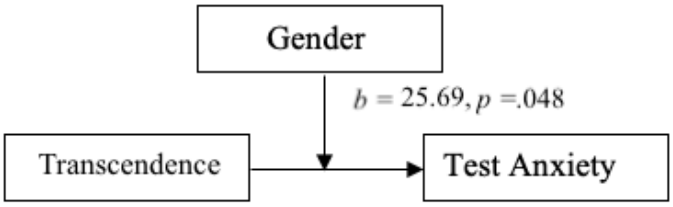

Figure 3.
Moderation model with the character virtue transcendence as predictor variable, test anxiety as outcome variable and gender as moderator.

Discussion

Aim of this study was to explore the associations between character strengths and respectively the overarching virtues and perceived college-related stress and test anxiety. The strengths zest, social intelligence, self-regulation, hope and humour correlated significant positive, but weak to moderate, with lower levels of college-related stress. Appreciation of excellence and beauty correlated significant negative with college-related stress, except zest, all character strength predicted lower levels of college-related stress, but no virtue. Furthermore, gender did not moderate the relationship between any virtue and college-related stress. Perspective and hope significantly correlated with lower test anxiety. Perspective and

spirituality predicted lower levels of test anxiety, but again no virtue. Only the relationship between transcendence and test anxiety was moderated by gender.

College-related stress

Character strengths and lower levels of college-related stress are related, as character strengths seem to buffer the stress college students perceive. Consistent with prior findings was that the virtue strength of humanity and self-regulation of the virtue temperance correlated with lower levels of college-related stress (Duan & Bu, 2019). Contradictory to prior findings was that no wisdom and knowledge strength correlated with college-related stress, as it was argued that wisdom is linked with more psychological resources one can benefit from in times of stress (Duan, 2016). A possible explanation for the absence of the interaction could be the way strengths were assessed. Gustems-Carnicer and Calderón (2015) stressed, that for the strength love of learning especially the openness towards new learning opportunities helps students to collect positive experiences which leads subsequently to higher engagement in learning and fewer stress symptoms. The VIA-72 on the other hand rather assessed this strength by including items related to reading or life-long learning. Further, it could be possible that the enjoyment of learning does not mean that college students are not stressed by the assessment and other hassles at university. On the other hand, Peterson and Seligman (2004) summarized that people with higher levels of love of learning are rather complex thinkers and that they might be able to adjust better to stress as they are not too affected by occasionally stressful events. Thus, the responsiveness to stress might be determined by the degree of enjoyment.

As hope was not prominently related in previous studies to lower levels of college-related stress, this finding was initially not assumed. However, in the current study, they were found to be related and hope was among the most prevalent strengths in the current, but also other college student samples (Lounsbury et al., 2009). Similar findings were made by Mousa, Menssey, and Kamel (2017). Hopeful people expect good outcomes for future events and are optimistic and future-oriented (Peterson & Seligman, 2004). Hope showed to help those students to handle stressful situations, not only in acute but also in prolonged intervals, if they expected better outcomes. It is argued, that hope could function as a defending factor against the perception of negative emotions, such as stress, as this helps to deal with the uncertainties about outcomes of situations through the optimistic cognitive appraisal (Mousa et al., 2017).

Test anxiety

The strengths hope and self-regulation were expected to be significantly related to lower levels test anxiety in previous studies (Kossakowska-Pisarek, 2016; Weber et al., 2014; Pekrun et al., 2004). Indeed, the findings regarding hope were also confirmed in the current study. Tang (2019) made similar findings in college students and argued, that the intolerance of uncertainty, what oppositional to hope is, was perceived particularly threatening by students. Further, hopeful students had higher motivation and positive emotions related to university, subsequently associated with lower test anxiety (Tang, 2019; Pekrun et al, 2004).

Surprisingly, no significant relationship was observed between self-regulation and test anxiety. A similar finding was made by Pintrich and de Groot (1990), although in the expected direction with higher levels of self-regulation being associated with lower levels of test anxiety, just as in the current study. It was explained that the strength self-regulation was low in the sample, and thus no relation was found. This is consistent with the finding of the current study, but also in the study by Lounsbury et al. (2009), self-regulation was among the least prevalent character strengths in the college student sample.

Not expected was the relationship between higher levels of the strength perspective and lower levels of test anxiety, demonstrated in the correlation and linear regression. The strength perspective is the ability to have multiple views on the world and situations and to contribute this wisdom advises to others (Peterson & Seligman, 2004). Alammari and Bukhary (2019) describe that the balance of confrontation with test situations might be helpful to foster the strength of perspective, and the obtained experience can help to deal with future stressful events. However, this relation changes in the opposite direction when too many negative stressful life experiences occurred, therefore minor stressors seem to be important to foster the strength (Peterson & Seligman, 2004; Gerwing et al., 2015). Findings of the current study could be explained that if the test anxiety is still adequate, this could result in the presence of perspective in the students, perhaps even assisting students to deal with the associated worry and emotionality (Gerwing, et al., 2015). This is consistent with the finding that the level of exam anxiety is rather average in this sample.

Moderation analysis

No virtue correlated significantly with test anxiety, only two with college-related stress and only a few significant correlations with strengths were found. Therefore, the assumption for a moderation analysis that variables correlate was not sufficiently met as

without a relation, no moderation can be established (Field, 2013). This could explain why moderating effects were small or not present. The only moderation of gender found to be significant was between transcendence and test anxiety. Although transcendence did not significantly correlate with lower levels of test anxiety, two strengths of the virtue did correlate, namely hope and with the emotionality subscale also spirituality, which also predicted lower levels of test anxiety. Transcendence includes strengths that create a connection between oneself and the larger universe and adds purpose to live. McMahon and Biggs (2012) also observed that females with higher spirituality subsequently score lower on anxiety. They highlight that self-perception of one as being as meaningful, helps individuals to encounter challenging or intimidating situations and the subsequent anxious feelings associated with test are reduced (McMahon & Biggs, 2012). As a possible explanation for the finding that females scoring low on transcendence score higher in test anxiety could be the social stigma and other challenges women, but not men encounter during the college time, thus transcendence can help females to encounter these challenges by higher self-perceived meaningfulness and drawing meaning of a crisis (Davis, Kerr, & Kurpius, 2003).

Strengths and limitations

The first strength of the study is that, besides overall good reliability scores, the CSSS and TAI were mainly tested on samples, consisting of students from social sciences (Feldt & Koch, 2011; Szafranski, et al., 2012), psychometric properties were comparable since they were tested on similar samples. An advantage of using the VIA-72 in this study was, that the participants could fill in the questionnaire relatively quickly, the time participants had to invest in the survey was approximately the same as they would be credited within the SONA system. As a reference, the regular VIA-IS takes approximately 45 minutes to complete and the VIA-72 approximately ten to fifteen (Peterson, 2006). Thus, using the VIA-72 did its purpose, but if researchers could find participants filling out the VIA-IS, this strength could be even more powerful. As described previously the Cronbach's α for the VIA-72 is .75 on average (VIA Institute, n.d.-b), while the VIA-IS has a Cronbach's α of .83 on average (VIA Institute, n.d.-a), therefore, the reliability could be enhanced.

As many German participants took part in this study, potential language barriers could have caused misunderstandings, for instance through interpreting the items incorrectly. Therefore, this possibility cannot be ruled out for students acquired through the personal acquaintances of the researcher. However, for future research, an additional translated

questionnaire could be held available to avoid such biases and subsequently the current research could have benefitted from this action.

A non-randomized cross-sectional sampling technique was utilized, therefore mainly students from the BMS faculties in SONA were reached. Further, since the researcher used the own social network for the sampling procedure, also mainly college students from the social sciences were contacted and therefore included. Therefore, the generalizability of the results to the initially targeted group 'students' is limited, implications should be taken with caution as this sample is not representative. An example how student differ between faculties was indicated in a study by Gerwing et al. (2015) showing that there are differences of test anxiety between different faculties of up to 17% between the highest and lowest score of test anxiety. Possible reasons for differences were more frequent or higher stake exams. However, this effect was not captured in the current study as it was not relevant for the research question.

Recommendations

Although utilizing the VIA-72 had convenience benefits for the approached target group it had also limitations. If researchers want to further investigate the relationship between character strengths and college-related stress and respectively test anxiety, it is recommended to find participating students that have more time to fill in more precise measurements, as this could measure the concepts of the strengths better. Although psychometric properties of the VIA-72 were reported to be good in previous studies (Macdonald et al., 2008; VIA Institute, n.d.-b), questionnaires with higher psychometric soundness could be utilized. Further McGrath (2019) states that the broader diversity of the assessed items makes the VIA-IS form a more appropriate measurement to predict the prevalence of strengths and should therefore be utilized.

As mentioned, the cross-sectional sample was not randomly selected from university students. A more heterogeneous, representative sample is recommended, subsequently enhancing the generalizability of the findings to the broader student population. Therefore, students from different study directions should be included to ensure generalizability.

The current study assessed all measures on a self-reported basis. In previous research on test anxiety and college-related stress it was already recommended to include broader measurement techniques to cross-validate findings as overestimation might influence the memory in a selective manner and subsequently, answers could be imprecise (Skowron,

Wester, & Azen, 2004; Gerwing et al. 2015). A complementary approach could be considered with more objective measurements, cardiovascular responses were associated with college-related stress factors (Hughes, 2004) and test anxiety with salivary cortisol (Conneely & Hughes, 2010).

Finally, investigation of the negative effects of strength use is recommended in future research. Until now, the underuse of strengths was commonly investigated, but as mentioned in the introduction, Littman-Ovadia and Freidlin (2019) found relations of overuse of strengths related to psychopathologies. However, even though correlations were found in the current research between strengths and higher perceived stress or test anxiety, these correlations were too low to promote further concerns. It could be further investigated to what extent the balance plays an important role in optimal strength use as noted by Niemec (2019). Also, Peterson and Seligman (2004) stress the importance, that strengths must be viewed differently across settings as strengths in one setting might not be strengths in another setting. This could provide valuable insights for possible interventions constructed for college settings.

Conclusion

In the current study, most of the correlations between character strengths and college-related stress were non-significant with some exceptions. In particular, strengths belonging to the virtue transcendence were found to be related to lower levels of both problems. Overall, the only moderating effect of gender was found on the relationship between transcendence and test anxiety. Future research might utilize findings of the current study, as college-related stress and test anxiety display heightened levels of prevalence across campuses. The study had limitations in particular with a homogenous sample, suggesting caution with the generalizability of the findings. Further research is needed to tackle the limitation and could yield valuable insights for the general college student population. Possible directions for further research, especially concerning broader measurement techniques and imbalanced strength use are given.

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Appendices

Appendix A College Student Stress Scale (CSSS) (Feldt, 2008)

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

1. Felt anxious or distressed about personal relationships.
2. Felt anxious or distressed about family matters.
3. Felt anxious or distressed about financial matters.
4. Felt anxious or distressed about academic matters.
5. Felt anxious or distressed about housing matters.
6. Felt anxious or distressed about being away from home.
7. Questioned your ability to handle difficulties in your life.
8. Questioned your ability to attain your personal goals.
9. Felt anxious or distressed because events were not going as planned.
10. Felt as though you were NO longer in control of your life.
11. Felt overwhelmed by difficulties in your life.

Appendix B Test Anxiety Inventory (Spielberger et al., 1980)

1. I feel confident and relaxed while taking tests.
2. While taking examinations I have an uneasy, upset feeling.
3. Thinking about my grade in a course interferes with my work on tests.
4. I freeze up on important exams.
5. During exams I find myself thinking about whether I ‘ll ever get through school.
6. The harder I work at taking a test, the more confused I get.
7. Thoughts of doing poorly interfere with my concentration on tests.
8. I feel very jittery when taking an important test.
9. Even when I’m well prepared for a test, I feel very nervous about it.
10. I start feeling very uneasy just before getting a test paper back.
11. During tests I feel very tense.
12. I wish examinations did not bother me so much.
13. During important tests I am so tense that my stomach gets upset.
14. I seem to defeat myself while working on important tests.
15. I feel very panicky when I take an important test.
16. I worry a great deal before taking an important examination.
17. During tests I find myself thinking of the consequences of failing.
18. I feel my heart beating very fast during important tests.
19. After an exam is over I try to stop worrying about it, but I can’t.
20. During examinations I get so nervous that I forget facts I really know.

Appendix C Values in Action (VIA-72) (Peterson & Seligman, 2004)

1.Appreciation of excellence and beauty

1. I experience deep emotions when I see beautiful things.
2. I see beauty that other people pass by without noticing.
3. I am always aware of the natural beauty in the environment.

2.Bravery

4. I have taken frequent stands in the face of strong opposition.
5. I must stand up for what I believe in.
6. I always stand up for my beliefs.

3.Creativity

7. I am always coming up with new ways to do things.
8. My friends say that I have lots of new and different ideas.
9. I am an original thinker.

4.Curiosity

10. I am always busy with something interesting.
11. I am excited by many different activities.
12. I can find something of interest in any situation.

5.Fairness

13. Everyone's rights are equally important to me.
14. I give everyone a chance.
15. I believe that it is worth listening to everyone's opinions.

6.Forgiveness

16. I rarely hold a grudge.
17. I believe it is best to forgive and forget.
18. I am usually willing to give someone another chance.

7.Gratitude

19. I am an extremely grateful person.
20. I feel a profound sense of appreciation every day.
21. I feel thankful for what I have received in life.

8.Honesty

22. I always keep my promises.
23. My promises can be trusted.
24. I am true to my own values.

9.Hope

25. I always look on the bright side.
26. Despite challenges, I always remain hopeful about the future.
27. I know that I will succeed with the goals I set for myself.

10.Humility

28. I never brag about my accomplishments.
29. I rarely call attention to myself.
30. I have been told that modesty is one of my most notable characteristics.

11.Humour

31. I try to add some humour to whatever I do.
32. I am known for my good sense of humour.
33. I have a great sense of humour.

12. Kindness

34. I really enjoy doing small favours for friends.
35. I go out of my way to cheer up people who appear down.
36. I enjoy being kind to others.

13.Judgement

37. Thinking things through is part of who I am.
38. I try to have good reasons for my important decisions.
39. I always weigh the pro's and con's.

14.Leadership

40. As a leader, I treat everyone equally well regardless of his or her experience.
41. One of my strengths is helping a group of people work well together even when they have their differences.
42. To be an effective leader, I treat everyone the same.

15.Love

43. I always feel the presence of love in my life.
44. I can express love to someone else.
45. I can accept love from others.

16.Love of learning

46. I am a true life-long learner.
47. I read all of the time.
48. I read a huge variety of books.

17.Perspective

49. People describe me as "wise beyond my years."
50. Others consider me to be a wise person.
51. I have a mature view on life.

18.Perseverance

52. I never quit a task before it is done.
53. I always finish what I start.
54. I finish things despite obstacles in the way.

19.Prudence

55. I think through the consequences every time before I act.
56. I always make careful choices.
57. I am a very careful person.

20.Self-regulation

58. I am a highly disciplined person.
59. Even when candy or cookies are under my nose, I never overeat.
60. I can always stay on a diet.

21.Social intelligence

61. I know how to handle myself in different social situations.
62. No matter what the situation, I am able to fit in.
63. I always know what to say to make people feel good.

22.Spirituality

64. I am a spiritual person.
65. My faith makes me who I am.
66. I practice my religion.

23.Teamwork

67. Without exception, I support my teammates or fellow group members.
68. It is important to me to respect decisions made by my group.
69. Even if I disagree with them, I always respect the leaders of my group.

24. Zest

70. I awaken with a sense of excitement about the day's possibilities.
71. I look forward to each new day.
72. I have lots of energy.

Appendix D Character strengths and virtues measured by the Values in Action Inventory

Table 8.

Character strengths and virtues measured by the values in action inventory

Virtue	Strength
Wisdom and knowledge	Creativity
	Curiosity
	Judgement
	Love of Learning
	Perspective
Strengths of courage	
	Bravery
	Perseverance
	Honesty
	Zest
Strengths of humanity	
	Capacity to love and be loved/ Love
	Kindness
	Social Intelligence
Justice	
	Teamwork
	Fairness
	Leadership
Temperance	
	Forgiveness and Mercy
	Modesty and Humility
	Prudence
	Self-regulation
Transcendence	
	Appreciation of excellence and beauty
	Gratefulness
	Hope
	Humour
	Religiousness and Spirituality

Appendix E Informed consent

The researcher hereby thanks you in advance for your participation in the survey. The purpose of this study is to investigate the relationship between character strengths University students possess and their relation towards exam anxiety and the stress they perceive as students. This is based on your own, subjective perception. To gain more knowledge about this topic, this questionnaire was designed. The results of this survey will be used for a research project at the University of Twente in the Netherlands. Your data will be anonymized for processing, no names or other personal data will be disclosed.

During the course of the study, you will be asked demographic questions as well as questions regarding your character strengths, the stress you perceive and your perception towards exam-anxiety. For each question, please indicate to what extent you agree with the statement at the moment or how you experienced in the past semester (what is applicable will be indicated). Try to answer the questions as honestly as possible. There are no right or wrong answers, this study deals with your personal perception. If some questions seem confusing to you, leave these questions unanswered. Overall, the completion of the questionnaire takes about 15 minutes.

By clicking to 'agree', you agree to volunteer to participate in this survey and to be informed about the methodology of the survey. The scientist does not expect any risks to you that might be related to the study. You also have the right to withdraw from this study at any time. You can use this option without having to give a reason. This questionnaire has been ethically Approved by the BMS Ethics Committee of the University of Twente.

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(s), 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.

I am aware that my personal data will be treated anonymously and will only be used in the interest of the study. I consent voluntarily to be a participant in this study and understand that I can refuse to answer questions and I can withdraw from the study at any time, without having to give a reason.

My data will not be disclosed to third parties. I do not expect any consideration or payment for my participation. If I need more information about the survey, now or in the future, I can contact Lara Bernebée-Say (l.bernebee-say@student.utwente.nl).

Appendix F Correlation of the variables

Table 9.
*Pearson's correlations for character strengths and virtues and strengths, college-related stress and test anxiety (N=*73).

		CSSS	TAI	TAI-Emotionality	TAI-Worry
Total score character strengths	r	.156	-.087	-.136	-.095
	Sig. (1-tailed)	.094	.231	.126	.212
Wisdom and knowledge	r	-.051	-.064	-.047	-.117
	Sig. (1-tailed)	.334	.295	.347	.162
Creativity	r	-,029	-.097	-.096	-.120
	Sig. (1-tailed)	.404	.207	.210	.156
Curiosity	r	.069	-.073	-.028	-.170
	Sig. (1-tailed)	.281	.270	.408	.075
Judgement	r	-.125	-.179	-.229*	-.094
	Sig. (1-tailed)	.146	.065	.026	.215
Love of learning	r	-.150	-.123	-.082	-.167
	Sig. (1-tailed)	.103	.149	.245	.078
Perspective	r	.098	.279**	.287**	.208*
	Sig. (1-tailed)	.206	.009	.007	.039
Strengths of courage	r	.209*	-.096	-.139	-.100
	Sig. (1-tailed)	.038	.211	.121	.199
Bravery	r	.139	-.033	-.104	.010
	Sig. (1-tailed)	.120	.391	.190	.466
Perseverance	r	.051	-.072	-.092	-.073
	Sig. (1-tailed)	.333	.272	.219	.269
Honesty	r	.134	-.024	-.069	.003
	Sig. (1-tailed)	.130	.420	.282	.489
Zest	r	.202*	-.096	-.073	-.171

	Sig. (1-tailed)	.043	.209	.271	.074
Strengths of humanity	r	.211*	.001	-.046	.011
	Sig. (1-tailed)	.037	.496	.350	.464
Love	r	.154	.009	-.067	.056
	Sig. (1-tailed)	.097	.469	.287	.318
Kindness	r	.102	.003	-.030	.030
	Sig. (1-tailed)	.196	.490	.402	.401
Social Intelligence	r	.227*	-.010	-.003	-.069
	Sig. (1-tailed)	.027	.465	.491	.280
Justice	r	.083	-.138	-.152	-.153
	Sig. (1-tailed)	.243	.122	.100	.099
Teamwork	r	.067	-.066	-.110	-.036
	Sig. (1-tailed)	.286	.290	.176	.382
Fairness	r	.008	-.121	-.112	-.148
	Sig. (1-tailed)	.472	.154	.173	.106
Leadership	r	.131	-.148	-.152	-.179
	Sig. (1-tailed)	.134	.106	.099	.064
Temperance	r	.118	-.013	-.091	.018
	Sig. (1-tailed)	.160	.455	.222	.438
Forgiveness	r	.122	.038	.059	-.068
	Sig. (1-tailed)	.152	.376	.309	.284
Humility	r	.102	-.049	-.066	-.060
	Sig. (1-tailed)	.195	.341	.289	.307
Prudence	r	-.176	-.154	-.252*	-.037
	Sig. (1-tailed)	.068	.096	.016	.376
Self-regulation	r	.253*	.123	.043	.171
	Sig. (1-tailed)	.015	.150	.360	.074
Transcendence	r	.047	-.029	-.046	-.028

	Sig. (1-tailed)	.346	.405	.351	.407
Appreciation of excellence and beauty	r	-.238*	-.109	-.112	-.102
	Sig. (1-tailed)	.021	.179	.173	.196
Gratitude	r	.058	.117	.052	.145
	Sig. (1-tailed)	.312	.163	.330	.111
Hope	r	.361**	.211*	.224*	.126
	Sig. (1-tailed)	.001	.036	.028	.144
Humour	r	.293**	.082	.071	.099
	Sig. (1-tailed)	.006	.244	.275	.202
Spirituality	r	.169	.228	.221*	.208
	Sig. (1-tailed)	.077	.063	.030	.068

Note. CSSS=College Student Stress Scale. TAI=Test Anxiety Inventory. TAI-Emotionality=Emotionality Subscale of the TAI. TAI-Worry=Worry Subscale of the TAI. *. Correlation is significant at p<.05 level(1-tailed). **. Correlation is significant at the 0.01 level (1-tailed).

Appendix G Simple linear regression analysis for the variables

Table 10.

Simple linear regression analysis for character virtues and strengths and college-related stress (N=73).

	R^2	F	p
Wisdom and knowledge	.003	.185	.669
Creativity	.001	.060	.808
Curiosity	.005	.339	.562
Judgement	.016	1.125	.292
Love of learning	.022	1.633	.206
Perspective	-.004	.683	.411
Strengths of courage	.044	3.243	.076
Bravery	.019	1.407	.240
Perseverance	-.011	.187	.667
Honesty	.018	1.290	.260
Zest	.041	3.014	.087
Strengths of Humanity	.044	3.294	.074
Love	.024	1.729	.193
Kindness	.010	.741	.392
Social intelligence	.051	3.841	.054*
Justice	.007	.490	.486
Teamwork	.005	.322	.572
Fairness	.001	.005	.944
Leadership	0.17	1.243	.269
Temperance	.014	1.004	.320
Forgiveness	.015	1.068	.305
Humility	.010	.749	.390
Prudence	.031	2.265	.137
Self-regulation	.063	4.856	.031*
Transcendence	.002	.159	.691
Appreciation of excellence and beauty	.057	4.275	.042*
Gratitude	.003	.242	.624
Hope	.130	10.610	.002*
Humour	.086	6.669	.012*
Spirituality	.028	2.077	.154

Note. *significant at p<.05

Table 11.

Simple linear regression analysis for character virtues and strengths and test anxiety (N=73).

	R^2	F	p
Wisdom and knowledge	.004	.293	.590
Creativity	.009	.676	.414
Curiosity	.005	.339	.562
Judgement	.032	2.353	.129
Love of learning	.015	1.097	.298
Perspective	0.78	5.970	.017*
Strengths of courage	.009	.654	.421
Bravery	.001	.077	.783
Perseverance	.005	.371	.544
Honesty	.001	.041	.839
Zest	.009	.666	.417
Strengths of humanity	.000	.000	.991
Love	.000	.006	.939
Kindness	.000	.001	.981
Social intelligence	.000	.008	.931
Justice	.019	1.384	.243
Teamwork	.004	.309	.580
Fairness	.015	1.056	.308
Leadership	0.22	1.589	.212
Temperance	.000	.013	.911
Forgiveness	.001	.101	.751
Humility	.002	.169	.682
Prudence	.024	1.731	.193
Self-regulation	.015	1.093	.299
Transcendence	.001	.059	.809
Appreciation of excellence and beauty	.012	.853	.359
Gratitude	.014	.978	.326
Hope	.045	3.312	.073
Humour	.007	.486	.488
Spirituality	.052	3.882	.053*

Note. *significant at p<.05

Appendix H Moderation analysis of the variables

Table 12.

Moderation effect of gender on character virtues and college-related stress (N=72).

Predictors	b	SE	t	p	R^2
Wisdom and knowledge	-3.702	4.184	-.884	.379	.070
Gender	-15.267	15.350	-.994	.323	
Interaction (Wisdom and knowledge x Gender)	4.111	5.341	.769	.444	
Strength of courage	-.939	4.375	-.214	.830	.114
Gender	22.032	15.195	-1.449	.151	
Interaction (Strength of Courage x Gender)	6.399	5,137	1.248	.216	
Strength of humanity	.782	3.580	.218	.827	.172
Gender	-22.076	12.600	-1.752	.084	
Interaction (Strength of humanity x Gender)	5.898	4.200	1.404	.164	
Justice	.742	3.318	.223	.823	.075
Gender	-8.582	12.269	-.699	.486	
Interaction (Justice x Gender)	1.655	4.000	.413	.680	
Temperance	.519	3.048	.170	.865	.089
Gender	-12.176	10.586	-1.150	.254	
Interaction (Temperance x Gender)	3.232	3.942	.820	.415	
Transcendence	-3.768	4.964	-.759	.450	.098
Gender	-26.742	15.918	-1.680	.097	
Interaction (Transcendence x Gender)	8.426	5.811	1.450	.151	

*Note.**significant at $p<.05$. F (1,68)

Table 13.

Moderation effect of gender on character virtues and test anxiety (N=72).

Predictors	b	SE	t	p	R^2
Wisdom and knowledge	-6.500	9.313	-.694	.490	.014
Gender	-14.464	34.163	-.427	.670	
Interaction (Wisdom and knowledge x Gender)	4.193	11.887	.352	.725	
Strength of courage	-18.137	9.775	-1.855	.067	.054
Gender	-57.780	33.945	-1.702	.093	
Interaction (Strength of Courage x Gender)	18.662	11.454	1.629	.107	
Strength of humanity	-6.718	8.422	-.797	.427	.020
Gender	-31.691	29.637	-1.069	.288	
Interaction (Strength of humanity x Gender)	9.802	9.879	.992	.324	
Justice	-8.254	7.341	-1.124	.264	.032
Gender	-16.116	27.141	-.593	.554	
Interaction (Justice x Gender)	4.577	8.849	.517	.606	
Temperance	-5.091.	6.847	-.743	.459	.017
Gender	-22.633	23.782	-.951	.344	
Interaction (Temperance x Gender)	7.622	8.856	.860	.392	
Transcendence	-19.502	10.947	-1.781	.079	.062
Gender	-72.329	35.102	-2.060	.043*	
Interaction (Transcendence x Gender)	25.695	12.815	2.005	.048*	

Note. *significant at $p<.05$, F (1,68)