The Interplay of Personality, Stress and Academic Performance in University

Students

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Abstract

Background: Over 60% of students in the Netherlands experience excessive stress levels. Stress negatively impacts physical and mental health, though some studies suggest a motivating effect in regard to academic performance. Personality was found to significantly affect stress perception and academic performance. Particularly conscientious individuals were linked to less stress and higher academic success and neurotic inviduals with more stress but differing results regarding academic outcomes. Therefore, comprehending the dynamic between these variables is crucial for helping increase students' well-being and academic success.

Aim: This study investigates the interplay between conscientiousness, neuroticism, academic performance and stress, while focusing on the potential mediating role of stress.

Methods: The participants, *N*=130 university students in the Netherlands and Germany were recruited through snowball and convenience sampling. They participated in an online study measuring conscientiousness, neuroticism, stress and academic performance. The gathered data were analysed using correlation, regression and meditation.

Results: Conscientiousness significantly predicted academic performance. Stress partially mediated the relationship between conscientiousness and academic performance, and neuroticism and academic performance. Neuroticism had a significant positive effect on academic performance, while controlling for stress.

Conclusions: This research emphasizes the importance of acknowledging personality differences in educational strategies and interventions, to optimize academic performance and well-being, by the potential implementation of stress reduction and skill optimization interventions.

Keywords: conscientiousness, neuroticism, stress, academic performance

Introduction

In recent years, over 60% of the students in the Netherlands, have reported excessive stress levels (Slimmen et al., 2022). Students, particularly in higher education are faced with big transitions such as moving out and adapting to new environments, which can potentially be very competitive. The academic standards change in comparison to high school, meaning there is a much more accelerated pace of study, which goes into much more depth, paired with a completely different work schedule and rhythm (Wang et al., 2023; Guzmán et al., 2023). These changes create a lot of pressure and in turn immensely increase stress levels in university students, making them vulnerable to experience stress (Olivera et al., 2023).

Generally said, stress describes a tense or anxious state brought on by difficult circumstances (WHO, 2022). It is triggered or perceived when individuals believe that their well-being is threatened due to external demands (Böke et al., 2019). There are multiple factors, which can cause stress such as emotional arousal, fear or concentration. In addition to this, stress leads to negative consequences on one's physical and mental health because of the danger it poses to one's wellbeing. Therefore, understanding the adverse effects of stress and addressing their impact, is of utter importance.

According to McClain & Abramson (1995) stress in university students has been connected to a higher prevalence of stress symptoms, as well as depression and decreased well-being. Stress in students has been found to lead to burnout-related disorders such as avoidance of social contact or emotional exhaustion, as well as an overall decrease in. This makes students a 'very high-risk population' for mental health problems (Slimmen et al., 2022). Predictably, stress also adversely affects one's academic performance, due to being overwhelmed with managing their tasks (Vlisides, Eddy, & Mozie, 1994). Khan et al. (2013) discovered a link associating higher stress levels with lower academic performance. Similarly, Sohail et al. (2013) found a negative relationship between stress and academic

performance, hence increased stress in a student's life correlated with lower academic performance. Hereby other factors such as the sources of stress, the amount of stress and stress-related coping strategies were considered additionally. In a study by Elias et al. 2011 a sample of students was selected to fill out a questionnaire assessing their stress levels. Their academic performance was measured through their grade point average. Here a weak but significant relationship was found between stress and academic achievement.

Even though most research indicated a negative relationship between stress and academic performance, in a study by Corzo Zavaleta et al. (2021), the opposite effect was observed. Stress served as a motivating factor here, hence increasing academic performance in the sample of students assessed in the study. Here it is important to mention that the different manifestations of stress were considered, namely physical, psychological and behavioural manifestations of stress. It can be seen that findings regarding the interplay between stress and academic performance remain inconclusive. Given this knowledge other links and factors might need to be considered, to prevent students from experiencing such negative mental, physical and academic consequences.

The Influence of Personality on Stress and Academic Performance

Research has consistently indicated personality as a factor significantly influencing stress and academic performance. The traits of conscientiousness and neuroticism have shown to be particularly influential. Conscientious people tend to be self-disciplined, good at planning and very organized. Neurotic people, on the other hand, are particularly vulnerable to negative emotions such as anxiety, depression or anger (Mammadov, 2021).

The traits of conscientiousness and neuroticism have shown differing results in regard to stress management and general stress levels. In a study by Mirhaghi & Sarabian (2016) it was found that conscientious individuals in the medical branch were able to focus better on

the task at hand. This was explained by their goal-oriented nature, allowing them to plan out how they will complete the task, without allowing for distractions. These findings were confirmed in a meta-analytic review of the links between personality and stress by Luo et al. (2022). Here conscientious individuals, who were characterized as inclined to plan ahead, were associated with lower exposure to stressors. Since people with higher conscientiousness can set aside strong emotions, it is easier for them to stay focused on the goals ahead of them and effectively complete their tasks (Luo et el., 2022). This characteristic protects such individuals from exposure to stressful events and circumstances. According to Hill et al., (2013) conscientiousness can result in beneficial consequences by implementing factors such as practicing health-promoting behaviours and inoculating pathways such as risk-reducing behaviour. Foreseeably, due to their systematic meticulous, and precise way of working, conscientious students also tend to perform better during examinations or general evaluations (Kommaraju et al., 2009). In another study by De Feyter et al. (2012), which examined the indirect effects of the Big Five personality traits on academic performance, conscientiousness turned out to be a strong predictor of academic motivation. This in turn positively affected their academic performance, because their inherent traits of diligence and discipline drove them to excel academically (De Feyter et al., 2012).

On the other hand, in contrast to people high in conscientiousness, neurotic individuals were found to experience higher stress levels, since they have difficulties managing their emotions, which in turn affects their ability to cope (Mirhaghi & Sarabian 2016). Furthermore, a positive correlation was found between neuroticism and stress (Luo et al., 2022). Overall, neuroticism is associated with higher feelings of anxiety, tension, sadness and nervousness (John et al., 2008). It is believed that neuroticism stems from an active behavioural inhibition system, making individuals high in this trait more sensitive to signs of danger or punishment (Gray, 1987). Hence, highly neurotic people are more likely to end up

in stressful environments or even create stressful situations, due to their emotional instability. Consequently, neuroticism is positively associated with mental and physical stress responses as well as, stress exposure. Regarding the academic performance of neurotic individuals, mixed results were revealed. Most research concludes a negative association between neuroticism and academic performance. There appears to be a tendency to perform worse academically when one is high in neuroticism, due to the unorganized, less emotionally stable and anxious trait inherences (Chamorro-Premuzic & Furnham, 2003; Furnham & Monsen, 2009). Lower emotional stability is associated with more stress, which leads to worse academic performance (Khan et al., 2013; Sohail et al., 2013). However, in De Feyter's study (2012) a positive effect of neuroticism was found on academic performance, while also including other variables such as self-efficacy in the model.

These findings highlight the complex interplay between personality, stress and academic performance. When taking these variables and the existing links between them, into consideration a detailed picture of the interaction between all factors can be created, while looking at the potential mediating effect of stress. This will aid in gaining more insights on how to improve students' overall well-being, and academic performance and simultaneously decrease stress levels.

The Current Study

The relationship between personality traits, specifically conscientiousness and neuroticism, and academic performance, with stress as a mediator has not been comprehensively studied. Therefore, the current study aims to minimize this gap in research, as well as provide new insights about this complex dynamic. After examining existing research, it can be hypothesized that stress could potentially mediate the relationship between personality and academic performance. This leads to the following research question: "Does stress mediate the relationship between conscientiousness/neuroticism, and academic

performance in university students?" Accordingly, the following four hypotheses were proposed: (H1) There is a positive relationship between conscientiousness and academic performance, (H2) Stress mediates the positive relationship between conscientiousness and academic performance (see Figure 1), (H3) There is a negative relationship between neuroticism and academic performance, (H4) Stress mediates the negative relationship between neuroticism and academic performance (see Figure 2).

Figure 1
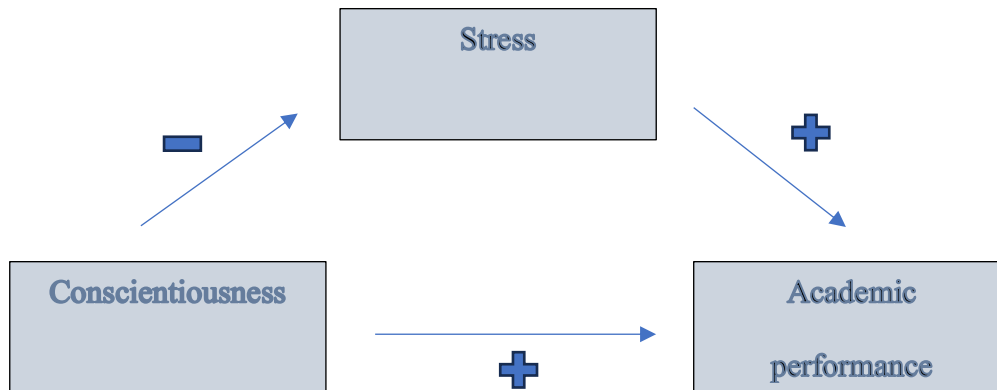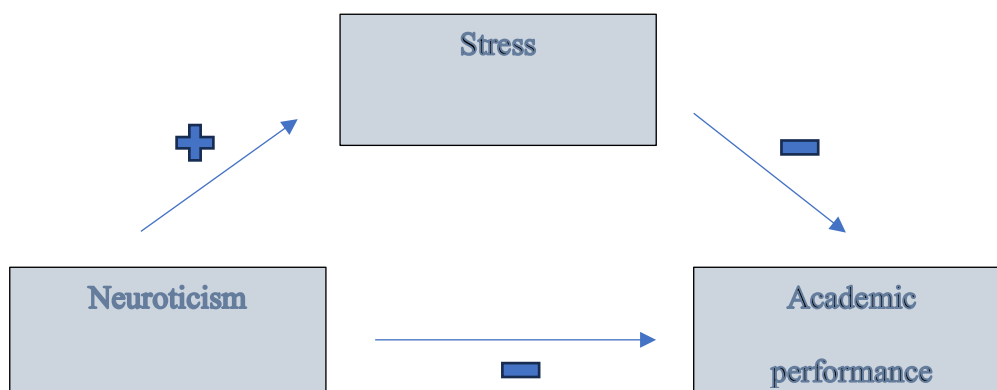
Mediation Model Conscientiousness

Figure 2

Mediation Model Neuroticism

Methods

Participants

The participants of this study were recruited mostly in the Netherlands and Germany using the methods of snowball and convenience sampling. The study was promoted via social media and the participants were also encouraged to share the study with others. Through the SONA-system website of the University of Twente, as well as the Qualtrics XM Experience Management Software, further students were recruited. The inclusion criteria of the study required the participants to have a minimum age of 18, to study in a university in the Netherlands or Germany and be fluent in English, German or Dutch. The Behavioural, Management, and Social Sciences Ethics Committee of the University of granted ethical approval (Request Number 240337) for this study on 25th March 2024 (see Appendix A).

Materials

The study was conducted in the form of an online questionnaire, which aimed to measure effects between the following variables: conscientiousness and neuroticism and academic performance with stress as a mediating variable. The study was conducted on the experience management software Qualtrics XM, as well as the SONA-system website of the University of Twente, which consisted of an informed consent form (see Appendix B), demographics and 3 different scales and inventories. The scales/ inventories were the Perceived Stress Scale, the Perceived Academic Performance scale and the Big Five Inventory (see Appendix C, Appendix D, Appendix E). After finishing the data collection, the data was analysed using RStudio (Version 2023.12.1+402) and the following packages: 'dplyr', 'tidyr', 'ggplot2', 'ggcorrplot' 'readr', 'readxl', 'mediation', 'MASS', 'lmtest' and 'car'.

Stress

The Perceived Stress Scale is constituted of 10 items, which were measured using a five – point Likert scale ranging from "0 = Never" to "4 = Very Often. Some examples of the items are: 'In the last month, how often have you been upset because of something that happened unexpectedly?' or 'In the last month, how often have you felt that you were unable to control the important things in your life?'. To measure the score per participant the sum of all items was calculated, while taking into account the items with reversed values. Here, according to Lee's research (2012) the Cronbach's alpha coefficient for this scale was α = 0.78. This indicates an acceptable internal consistency and reliability.

Academic Performance

The Perceived Academic performance scale consists of 5 items namely, 'I meet the official performance requirements expected out of a student.', 'I adequately complete assigned duties.', 'I fulfil responsibilities specified (e.g., study, homework, readings, papers) in the course outline.', 'I perform tasks that are expected of me', 'My performance is beyond demands.' This scale measured with a seven – point Likert scale, which ranges from *1* "do not agree at all" to *7* "very strongly agree". The maximum score for this scale was 35 points and it took less than five minutes to complete the questionnaire. Here the sum of all items also concluded the score per participant. According to Verner-Filion & Vallerand (2016) the Cronbach's alpha coefficient for this scale was α = 0.87 which translates to a good internal consistency and reliability.

Conscientiousness and Neuroticism

The Big Five Inventory uses a five – point Likert scale, ranging from *1* - "disagree strongly" to *5* - "agree strongly", across 44 items to measure the prevalence of each trait. The

maximum score one could achieve was 50 points per trait and it took about five minutes to fill out the questionnaire. For the purpose of this study the subscales for the traits of conscientiousness and neuroticism were of importance. Items such as 'I see myself as someone who does a thorough job' or 'I see myself as someone who is somewhat careless', which has a reversed value, were part of the conscientiousness subscale. Some examples of the neuroticism subscale were: 'I see myself as someone who is depressed, blue' and 'I see myself as someone who is relaxed, handles stress well', which also has a reversed value. Here, to obtain the score per participant the sum score of all items, was calculated, while also taking into consideration the items with reversed values. With a Cronbach's alpha coefficient of $\alpha = 0.83$ for males and $\alpha = 0.74$ for females, the neuroticism subscale presents a satisfactory internal consistency and reliability. The internal consistency of the subscale of conscientiousness was also satisfactory for both genders, $\alpha = 0.90$ for male and $\alpha = 0.92$ for females. Scores from 10-24 points indicate low conscientiousness/neuroticism. Moderate conscientiousness or neuroticism scores were defined in the range between 25-35 points. Anywhere between 36-50 points one was considered to score highly on conscientiousness/neuroticism (Laporte, 2019).

Data analysis

First, the data was cleaned of all missing values, which means participants who did not successfully complete all items of a questionnaire, were deleted from the dataset. Secondly, the descriptive statistics in the form of means, medians and standard deviations were computed for the sample, as well as each questionnaire. Thirdly, the assumptions of linearity, independence of errors, equal variances and normality of errors were checked with scatterplots, the Durbin-Watson test, the Breusch-Pagan test and the Shapiro-Wilk test. Moreover, the correlations between the predictor, outcome and mediator variable were also examined, to predict the strength and direction of the relationships. Additionally, both a

simple robust regression and a simple linear regression were administered to quantify the strength and direction of all possible pathways between the variables. Furthermore, a multiple robust regression analysis was conducted to provide a more nuanced overview of relationship between conscientiousness and neuroticism and academic performance, while accounting for the effect of stress. Lastly, a mediation analysis was performed to examine the effect between conscientiousness and neuroticism and academic performance with stress as a mediating variable.

Results

Initially N=187 participants took part in the study. After cleaning the data, a total of N=130 students remained, meaning 57 participants were excluded. All participants, who began the study but did not complete all questionnaires were rendered unsuitable and excluded, since the incomplete responses made the data insufficient. The genders were not evenly distributed, 83 participants identified as female, 43 as male and four as non-binary. The majority of the sample consisted of German university students. A small part of the participants, were Dutch and 18 of the students were other nationalities, which were later specified. Over half of the participants were third year Bachelor students. In Table 1 the sample characteristics are visualized.

Table 1

Sample Characteristics (N=130)

Variable	Description	%	n
Age	19-31 years	-	130
	(M=21,98; SD=2.13)		
Gender	Male	33.08	43

	Female	63.85	83
	Other	3.08	4
Nationality	Dutch	4.62	6
	German	81.54	106
	Other	13.85	18
Educational level	1st year Bachelor	13.85	18
	2nd year Bachelor	19.23	25
	3rd year Bachelor	51.54	67
	Pre-Master	6.92	9
	Master		9
	PhD		2

With a mean of 31.59 (SD=6.05) the sample of participants scored lower on the trait conscientiousness, compared to another sample of medical students, who scored a mean of 42.09, SD=6.06 (De Feyter et al., 2012). On the other hand, compared to the same sample, which had a mean of 32.37, the students scored lower on the trait of neuroticism (M=25.41; SD=6.00). Furthermore, the Perceived Stress Scale was consequently also filled out by the students. It showed that the perceived stress of the sample in this study is considered very high (M=33.3; SD=3.79), in comparison to the norm group (Cohen, 1983). Lastly the participants completed Academic Performance Scale, resulting in a mean of 26.32 (SD=5.56). This is very similar compared to the results in a study by Cunningham (2021).

Before the data was analysed, the four assumptions of linear regression were tested between all relevant variable relationships. In all regressions the assumption of linearity, homoscedasticity and independence of errors were not violated. The assumption of normality of errors was violated when testing stress on academic performance, as well as conscientiousness/neuroticism on academic performance (see Figure 3, Figure 4 and Figure 5). This means that the residuals are not normally distributed in these relationships. In order

to increase the reliability and general accuracy of the results, for these relationships the Spearman's rank-order correlation was conducted instead of the Person's correlation coefficient. Furthermore, a simple and multiple robust regression was applied instead of a simple and multiple linear regression. Lastly, the technique of bootstrapping was applied in the mediation analysis, to obtain reliable confidence intervals, as well as a more accurate estimation of the indirect effects and enhance the credibility of the results.

Figure 3

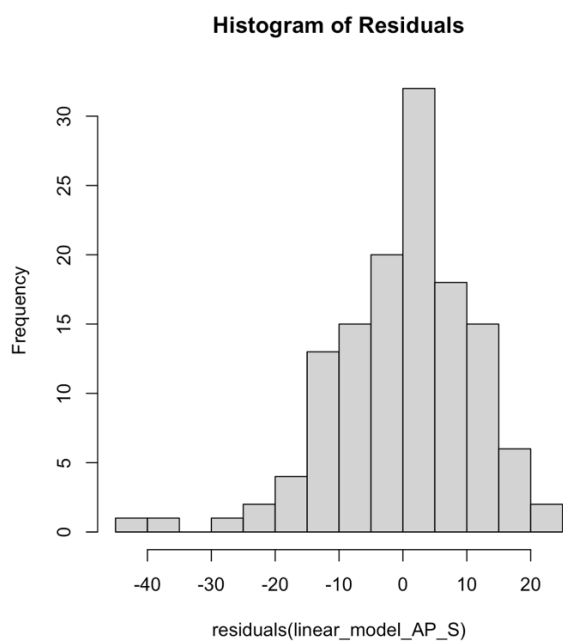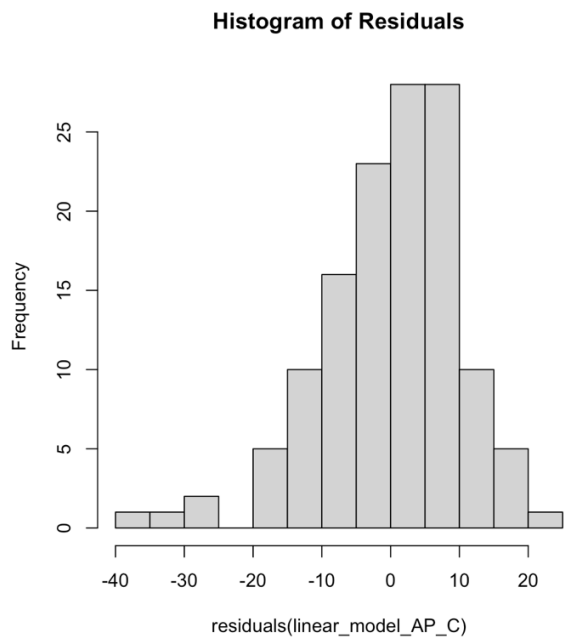*Histogram of residuals for stress and academic performance*

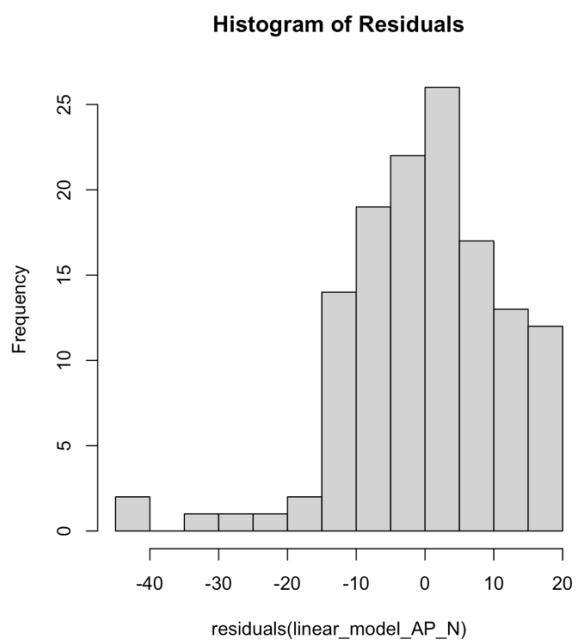Histogram of Residuals

Figure 4

Histogram of residuals for conscientiousness and academic performance

Histogram of Residuals

Figure 5

Histogram of residuals for neuroticism and academic performance

Histogram of Residuals

Hypothesis 1

The first hypothesis states that there is a positive relationship between

conscientiousness and academic performance. After conducting a Spearman's rank-order

correlation analysis to assess the direction of this relationship, see Table 2, a moderate

positive correlation was detected (ρ=0.36, p<.001). To more extensively examine the

relationship between conscientiousness and academic performance, a simple robust

regression analysis was administered. This analysis concluded conscientiousness to be a

significant positive predictor of academic performance (β=0.3475, SE=0.0708, t(128)=4.91,

p<.001). A significant proportion of variance in academic performance was explained by this

model, with conscientiousness as the predictor variable (R^2= 0.13, F(1, 128)=24.1, p<.001).

Additionally, a multiple robust regression analysis was carried out, to explore the relationship

between the two variables while simultaneously controlling for stress. Conscientiousness

remained a significant positive predictor of academic performance (β=0.3208, SE=0.0724,

t(127)=4.43, p<.001). Therefore, the first hypothesis can be accepted.

Table 2

Spearman Rank-Order Correlation Matrix for Conscientiousness, Stress and Academic

Performance

Variable	Conscientiousness	Stress	Academic performance
Conscientiousness	1.00	-0.26*	0.36**
Stress	-0.26*	1.00	-0.23*
Academic performance	0.36**	-0.23*	1.00

Note. * p<.01. ** p< .001

Hypothesis 2

The second hypothesis expresses stress as a mediator of the positive relationship

between conscientiousness and academic performance. To examine this, a bootstrapped

mediation analysis was conducted (see Table 3). The indirect effect, also known as Average

Causal Mediation Effect (ACME), of conscientiousness on academic performance through stress was significant, *ACME*=0.04, 95% CI[0.00, 0.10], *p*=0.046, indicating stress as a partial mediator in this relationship. The average direct effect (ADE) of conscientiousness on academic performance remained significant (*ADE*=0.32, 95% CI[0.16, 0.47], *p*<.001, even after controlling for stress. Ultimately, there was a significant total effect of conscientiousness on academic performance, *β*=0.36, 95% CI[0.20, 0.52], *p*<.001, with stress mediating approximately 11% of the effect of conscientiousness on academic performance. Concludingly, the second hypothesis can be accepted.

Table 3

Mediation Analysis Results for the Effect of Conscientiousness on Academic Performance Through Stress

Pathway	Effect Estimate (β)	95% Confidence Interval	p-value
Direct Effect (ADE)	0.32	[0.16, 0.47]	<.001**
Indirect Effect (ACME)	0.04	[0.00, 0.10]	0.46
Total Effect	0.36	[0.20, 0.52]	<.001**
Proportion Mediated	11%	-	-

*Note. * p*<.05. ** *p*< .001

Hypothesis 3

According to the third hypothesis, a negative relationship is suspected between neuroticism and academic performance. A Spearman's rank-order correlation analysis was conducted to assess the direction of this relationship and a very weak positive correlation was detected (*ρ*=0.035, *p*=.694), which was not statistically significant (see Table 4). To gain a more comprehensive understanding of the relationship between neuroticism and academic performance, a simple robust regression analysis was administered. It was concluded that neuroticism did not significantly predict academic performance (*β*=0.0382, *SE* =0.0784, *t*(128)=0.49, *p*=.626). However, after controlling for the effect of stress in a multiple robust

regression, neuroticism was found to be a significant positive predictor of academic performance (β=0.3055, *SE*=0.0977, *t*(127)=3.13, *p*<.01). Therefore, the third hypothesis, stating a negative relationship between the two variables, cannot be supported due to the mixed evidence from different analyses.

Table 4

Spearman Rank-Order Correlation Matrix for Neuroticism, Stress and Academic Performance

Variable	Neuroticism	Stress	Academic performance
Neuroticism	1.00	0.65**	0.03
Stress	0.65**	1.00	-0.23*
Academic performance	0.03	-0.23*	1.00

*Note. * p<.01. ** p< .001*

Hypothesis 4

The fourth hypothesis states that stress mediates the negative relationship between neuroticism and academic performance. Yet the results of the initial correlation and robust regression analyses did not support a negative relationship between neuroticism and academic performance. However, the mediation analysis did reveal stress as a significant partial mediator of the relationship between neuroticism and academic performance, the indirect effect being *ACME*=-0.30, 95% CI[-0.49, -0.15], *p*<.001. The direct effect of neuroticism on academic performance, while controlling stress, was found to be positive and significant *ADE*=0.34, 95% CI[0.15, 0.56], *p*<.001. On the other hand, the total effect of neuroticism on academic performance was not significant, β=0.04, 95% CI[-0.11, 0.19], *p*<.61. Nonetheless, given the lack of a significant negative relationship between neuroticism and academic performance, the mediation hypothesis cannot be supported. Therefore, the fourth hypothesis can be rejected.

Additional Findings

There were other noteworthy findings, which were not hypothesized, but the basis of the created models, such as the significantly strong, negative correlation between conscientiousness and stress, ρ= -0.26, p=.002 (see Table 2). Moreover, a strong positive relationship was observed between neuroticism and stress, as shown by a significant positive Spearman rank correlation, ρ=0.65, p<.001 (see Table 4). In addition, a weak negative correlation was shown between stress and academic performance, ρ= -0.23, p<.01 (see Table 2 and 4). After conducting a simple robust regression analysis to thoroughly check the supposed relationship between stress and academic performance, stress was revealed as a significant negative predictor of academic performance (β= -0.22, SE=0.08, t(128)= -2.72, p<.01).

Discussion

The purpose of this study was to examine connections between the personality traits conscientiousness and neuroticism, academic performance and stress among university students. Conscientiousness was revealed as a significant positive predictor of academic performance, meaning that higher scores in conscientiousness, correspond with better academic performance. Contrary to the third hypothesis, mixed results were revealed, regarding the relationship between neuroticism and academic performance when comparing the results from the simple and multiple robust regression. When controlling for the effect of stress, neuroticism was found to be a significant positive predictor of academic performance. However, when excluding stress, this effect was not revealed. Lastly, stress was found to partially mediate the relationship between both conscientiousness and neuroticism and academic performance. Nonetheless, stress did not mediate the initially expected negative relationship between neuroticism and academic performance. These findings indicate stress

as an important factor in the way personality affects academic performance, but not the sole contributor to the variations in academic success.

Conscientiousness, Stress and Academic Performance

A considerable amount of existing literature supports the first hypothesis, which suggests a positive relationship between conscientiousness and academic performance, meaning that conscientious students perform better academically (Kommaraju et al. 2009; De Feyter, 2012). Good organizational skills, discipline and goal-oriented behaviour, which are traits associated with conscientiousness, have been consistently linked with higher academic proficiency (Luo et al., 2022; Mammadov, 2021). The findings of this study reinforced the important and consistent effect of conscientiousness on academic performance, even while accounting for stress in the regression model. This implies that conscientious students, tend to engage in effective habits related to their study behaviour, such as time management, planning and continuous effort, which lead to improved academic proficiency.

Prior research reaffirms the second hypotheses, suggesting a positive link between conscientiousness and academic performance, with stress being an important factor in this relationship (Chamorro-Premuzic & Furnham, 2003; Vlisides, Eddy, & Mozie, 1994; Khan et al., 2013; Sohail, 2013). Conscientious individuals engage in factors, leading to lowered stress exposure such as risk-avoidant and health-improving behaviours. This implies that since conscientious individuals seem to experience less stress, due to their inherent behavioural tendencies, their academic success is higher. Conscientious individuals are more stable because they are less prone to experiencing stressful events. This occurs due to their resilience in regard to distracting negative events and their tendency to not be overridden by emotions (Hill et al., 2014). This stability, resulting from the trait of conscientiousness, acts as an enhancer on academic outcomes, which aligns with the notion that the less stress a

student perceives the better they perform (Vlisides, Eddy, & Mozie, 1994; Khan et al., 2013; Sohail 2013).

Neuroticism, Stress and Academic Performance

Contrary to the initial second hypothesis, no evidence was found to support the expected negative relationship between neuroticism and academic performance, meaning that students higher in neuroticism were not found to perform worse in an academic sense. These findings were partially in line with other research, stating weak or non-existing links between the variables (Mammadov, 2021). However, in the multiple regression model, interesting results were revealed, namely a significant positive relationship between neuroticism and academic performance, while accounting for the effect of stress. This is in contrast to the simple regression model, where stress was not accounted for, and no significant effect was revealed. This indicates that stress could be a potential confounding variable in this dynamic. This positive effect of neuroticism resembles results by De Feyter et al. (2012).

When looking at the indirect effect of stress in the relationship between neuroticism and academic performance it can be said that there is a complex dynamic at hand. In line with prior research, this study showed neuroticism to have a positive link with stress, meaning the higher the prevalence of the trait the more stress was experienced (Mirhaghi & Sarabian 2016). The increased stress, associated with this trait, then negatively impacted the students' academic performance. This aligns with most research which indicates high stress levels as a negative influence on academic success (Khan et al., 2013), suggesting that stress plays an important role in the dynamic between neuroticism and academic proficiency.

In contrast, the direct positive impact neuroticism had on academic success, aligns with research by De Feyter et al. (2012), where a similar positive effect was found after including self-efficacy in the model. This dual nature of neuroticism suggests a context or environment dependant effect, meaning that students high in this trait can use it in their

favour when faced with academic pressure. The idea of an optimal stress level, stating that a certain degree of stress increases performance (Aliya, 2022), might potentially explain the positive effect of neuroticism on academic performance. It is possible that neurotic people use their stress as a motivating factor, which increases concentration and organization due to the rise in pressure. These unexpected findings challenge the popular view, which associates neuroticism with less academic success, due to the inherent anxiety and emotional instability (Chamorro-Premuzic & Furnham, 2003). All in all, since stress only partially mediates the relationships between conscientiousness and neuroticism and academic performance, it indicates that other influential factors might have a significant impact in how personality affects academic proficiency.

Strengths and Limitations

After going into depth about the insights gained throughout the study, it is important to highlight some strengths and limitations of the study. Beginning with the strengths, it can be said that the study provided a relatively comprehensive analysis of the dynamic between conscientiousness and neuroticism, stress and academic performance, due to using multiple different robust statistical methods. The conduction of a Spearman's rank-order correlation, simple and multiple robust regression and a bootstrapped mediation analysis provided an extensive investigation of the hypothesis. Due to the applied methodological rigour, greater credibility, and strengthened validity and reliability are ensured. Lastly, it can be said that due to the examination of both direct and indirect effects of personality on academic performance, the study contributes to existing theoretical models. It highlights the importance of evaluating the role of stress in such dynamics and provides support to include stress management in educational interventions.

Even though the study provides valuable insights, there are some limitations, which need to be considered. Firstly, the reliance on convenience sampling introduces selection bias

and can affect generalizability. Furthermore, the sample may lack diversity in demographic characteristics. In this study, the target group was university students in Germany and the Netherlands. The majority of the participants were in the third year of their Bachelor, which means that they were most likely in a very intensive phase of their studies, such as writing their Bachelor's thesis. Secondly, the study relied on self-reported online measures, regarding the traits of conscientiousness and neuroticism, stress and academic performance. These variables may be subjected to social desirability biases or just inaccurately assessed by the participant. Moreover, the use of self-assessment may have led to common method variance, meaning that the data is influenced more by the method of measurement than actual discrepancies in the variable being measured. This could have exaggerated the observed relationships. Lastly, it is important to mention that while the variables were extensively explored, other variables such as self-efficacy, academic motivation and social support could have had a significant effect in explaining these relationships.

Implications and Recommendations for Future Research

There are various practical implications of the findings in an educational setting. Generally, the implementation of stress management programs, as well as mindfulness techniques to mitigate the negative effects can be very helpful for all students, especially neurotic students, who tend to be more susceptible to stressful experiences. Such programs could potentially increase overall well-being, and in turn academic success. Recognizing signs of high stress early on and applying the appropriate interventions in a timely manner can act preventatively in minimizing the negative effects of stress. Moreover, it is crucial for educational institutions to consider the impact of different personality traits on stress perception, as well as performance, in order to take appropriate measures fitting to the personality type of the student. One option could be creating workshops at universities, where

organizational skills are promoted to help enhance academic outcomes. Another possibility for a more individual approach could be taking a personality test. Afterwards the results would be analysed by a specialist. Finally, personalized academic advice or tutoring can be offered to the students in need of such kind of support, due to high stress levels, decreasing academic performance or both.

Some recommendations for future research, to overcome the limitations of this study could be incorporating more variables into the model such as self-efficacy or academic motivation to further examine influential factors in the interplay between personality and academic success. If further variables were introduced into the model, increasing the sample size to increase the statistical power and preciseness of the findings and reduce Type II errors, as well as bias, is recommended. Furthermore, the implementation of a different experimental design, such as a randomized controlled trial should be considered. Initially, all students would participate in personality and stress tests and report their current grade point average. Afterwards they would be assigned to random groups, one would be a stress management intervention, the second a study skills workshop and the third would be a control group. After two months, the post measures can be taken to examine the potential effect of the intervention. Applying randomized controlled trial, will increase reliability and generalizability by reducing bias, which might come from online studies, and controlling for confounding variables. Moreover, conducting a longitudinal study to examine long-term effects of the variables and hereby identify causal relationships and individual differences, could aid in offering more insights, to create more effective interventions. By implementing these changes and interventions, the understanding of the interplay between the variables will be deepened.

Conclusion

This research emphasized the significant influence of personality and stress on academic performance. The findings concluded a positive effect of conscientiousness on academic performance and revealed the mediating effect of stress in the relationship between conscientiousness, neuroticism and academic performance. In the mediation analysis, a dual effect was indicated for the trait of neuroticism, showing that neuroticism indirectly decreases academic performance but at the same time directly increases it. These results stress the importance of including personality and stress assessment into educational interventions, in order to create targeted interventions, which not only enhance students' academic proficiency but simultaneously improve students' mental health as well as improve general education quality.

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Appendices

Appendix A

Ethical Approval Form

UNIVERSITY OF TWENTE.
FACULTY BMS

240337 REQUEST FOR ETHICAL REVIEW

Request nr: 240337

Researcher: Dudde, A.M.

Supervisor: Vaessen, T.R.

Reviewer: –

Status: Waiting for supervisor

Version: 2

1. START

A. TITLE AND CONTEXT OF THE RESEARCH PROJECT

1. What is the title of the research project? (max. 100 characters)

Stress in University Students: Focus on personality, academic performance, social support & coping

2. In which context will you conduct this research?

Bachelor's Thesis

3. Date of the application

20-03-2024

5. Is this research project closely connected to a research project previously assessed by the BMS Ethics Committee?

No/Unknown

B. CONTACT INFORMATION

6. Contact information for the lead researcher

6a. Initials:

A.M.

6b. Surname:

Dudde

6c. Education/Department (if applicable):

B-PSY

6d. Staff or Student number:

2814579

6e. Email address:

a.m.dudde@student.utwente.nl

6f. Telephone number (during the research project):

+4917643661587

6g. If additional researchers (students and/or staff) will be involved in carrying out this research, please name them:

Elan Bozhkov (e.bozhkov@student.utwente.nl); Jana Milke
(j.milke@student.utwente.nl)

6h. Have you completed a PhD degree?

No

7. Contact information for the BMS Supervisor

7a. Initials:

T.R.

7b. Surname:

Vaessen

7c. Department:

BMS-PGT

7d. Email address:

t.r.vaessen@utwente.nl

7e. Telephone number (during the research project):

+31534896664

8. Is one of the ethics committee reviewers involved in your research? Note: not everyone is a reviewer.

No

C. RESEARCH PROJECT DESCRIPTION

9a. Please provide a brief description (150 words max.) of the background and aim(s) of your research project in non-expert language.

The primary objective of this research attempt is to examine the various components that contribute to the psychological phenomenon of stress among university students. Given the fact that university students are undergoing the process of adapting to a new environment and encountering a multitude of unfamiliar events, they are especially susceptible to experiencing stress. Perceived stress levels can be influenced by various factors, including variations in personality, academic performance, coping mechanisms, and levels of social support. The concept of coping techniques pertains to the various methods employed by individuals to effectively handle stress, whereas social support encompasses the aid and resources offered by others in times of difficulty. Furthermore, the concept of academic performance pertains to the degree of accomplishment and achievement that a student exhibits in their educational efforts within an educational establishment.

9b. Approximate starting date/end date of data collection:

Starting date: 2024-03-24

End date: 2024-05-30

9c. If applicable: indicate which external organization(s) has/have commissioned and/or provided funding for your research.

Commissioning organization(s):

Not applicable

Funding organization(s):

Not applicable

2. TYPE OF STUDY

Please select the type of study you plan to conduct:

I will be collecting new data from individuals acting as respondents, interviewees, participants or informants.

4. RESEARCH INVOLVING THE COLLECTION OF NEW DATA

A: RESEARCH POPULATION

20. Please provide a brief description of the intended research population(s):

The self-report questionnaire is aimed at 18+ year-old university students of all genders, and nationalities

21. How many individuals will be involved in your research?

This research aims to include ca. 200 participants.

22. Which characteristics must participants/sources possess in order to be included in your research?

Participants must be university students above the age of 18 and proficient in English or German.

23. Does this research specifically target minors (<16 years), people with cognitive impairments, people under institutional care (e.g. hospitals, nursing homes, prisons), specific ethnic groups, people in another country or any other special group that may be more vulnerable than the general population?

No

24. Are you planning to recruit participants for your research through the BMS test subject pool, SONA

Yes

B. METHODS OF DATA COLLECTION

25. What is the best description of your research?

- (Online) survey research

26. Please prove a brief yet sufficiently detailed overview of activities, as you would in the Procedure section of your thesis or paper. Among other things, please provide information about the information given to your research population, the manipulations (if applicable), the measures you use (at construct level), etc. in a way that is understandable for a relative lay person.

Participants need to fill in a self-report questionnaire, answering questions about perceived stress, personality, academic performance, coping, and social support.

How much time will each participant spend (mention the number of sessions/meetings in which they will

participate and the time per session/meeting)?

```
It will be one session of about 15-20 min.
```

C: BURDEN AND RISKS OF PARTICIPATION

27. Please provide a brief description of these burdens and/or risks and how you plan to minimize them:

```
Participants are sufficiently informed before, participation is
voluntary, and participants can withdraw at any time; there might be a
small risk concerning the security of the data, however, this is
diminished by using a website specialized in collecting data for
scientific research (SONA).
```

28. Can the participants benefit from the research and/or their participation in any way?

```
Yes
```

Please Explain:

```
By gaining SONA points.
```

29. Will the study expose the researcher to any risks (e.g. when collecting data in potentially dangerous environments or through dangerous activities, when dealing with sensitive or distressing topics, or when working in a setting that may pose 'lone worker' risks)?

```
No
```

D. INFORMED CONSENT

30. Will you inform potential research participants (and/or their legal repsentative(s), in case of non-competent participants) about the aims, activities, burdens and risks of the research before they decide whether to take part in the research?

```
Yes
```

Briefly clarify how:

```
Participants will be informed about the content, context, and aim of
the research beforehand. Information will be provided before the
survey starts.
```

32. How will you obtain the voluntary, informed consent of the research participants (or their legal repsentatives in case of non-competent participants)?

```
Active online consent
```

33. Will you clearly inform research participants that they can withdraw from the research at any time without explanation/justification?

```
Yes
```

34. Are the research participants somehow dependent on or in a subordinate position to the researcher(s) (e.g. students or relatives)?

```
No
```

35. Will participants receive any rewards, incentives or payments for participating in the research?

- ```
  For student participants: Human research participant credits (if
  you use the SONA test subject pool)
  ```

36. In the interest of transparency, it is a good practice to inform participants about what will happen after

their participation is completed. How will you inform participants about what will happen after their participation is concluded?

- Participants will receive the researcher's contact details, so that they can contact the researcher if they have questions/would like to know more.

E. CONFIDENTIALITY AND ANONYMITY

37. Does the data collected contain personal identifiable information that can be traced back to specific individuals/organizations?

No

39. Will you make use of audio or video recording?

No

5. DATA MANAGEMENT

- I have read the UT Data policy.
- I am aware of my responsibilities for the proper handling of data, regarding working with personal data, storage of data, sharing and presentation/publication of data.

6. OTHER POTENTIAL ETHICAL ISSUES/CONFLICTS OF INTEREST

40. Do you anticipate any other ethical issues/conflicts of interest in your research project that have not been previously noted in this application? Please state any issues and explain how you propose to deal with them. Additionally, if known indicate the purpose your results have (i.e. the results are used for e.g. policy, management, strategic or societal purposes).

There are no other ethical issues/conflicts of interest.

7. ATTACHMENTS

Informed Consent Bachelor.pdf

8. COMMENTS

-

9. CONCLUSION

Status: Waiting for supervisor

Appendix B

Informed Consent Form

Informed consent for the study: "Stress in University Students: Focus on personality, academic performance, social support & coping

You are being invited to participate in a research study titled **Stress in University Students: Focus on personality, academic performance, social support & coping**". This study is administered by **Elan Bozhkov, Anna-Katharina Dudde, Jana Milke** under the supervision of **Thomas Vaessen** from the Faculty of Behavioural, Management and Social Sciences at the University of Twente.

The purpose of this research study is to inspect the relationship between stress and other variables including personality, academic performance, coping, and social support. The study will take you approximately 20 minutes to complete. The data will be used for an academic report.

Your participation in this study is entirely voluntary and you can withdraw at any time.

We believe there are no known risks associated with this research study; however, as with any online-related activity, the risk of a breach is always possible. To the best of our ability your answers in this study will remain confidential amongst the project members. We will minimise any risks by **anonymizing all answers of the participants and deleting the results two years after the study is completed.**

Study contact details for further information:
Elan Bozhkov – e.bozhkov@student.utwente.nl
Anna-Katharina Dudde – a.m.dudde@student.utwente.nl

Jana Milke – j.milke@student.utwente.nl

Taking part in the study

I have read and understood the study information dated between 25.03.2024 and 31.05.2024, or it has been read to me.

I consent voluntarily to be a participant in this study and understand that I can withdraw from the study at any time, without having to give a reason.

I understand that taking part in the study involves answering the questions and that the responses to those questions will be saved and used for an academic report.

Use of the information in the study

I understand that the information I provide will be used for an academic report.

I understand that personal information collected about me that can identify me, such as [e.g. my name or where I live], will not be shared beyond the study team.

Future use and reuse of the information by others

I give permission for the **anonymized answers** that I provide to be archived in the project member's database for two years, so it can be used for future research and learning.

_____

_____

Please tick the appropriate box, whether you agree with the above statements and give your consent.   ☐*Yes*   ☐*No*

Appendix C

Perceived Academic Performance Scale

Perceived Academic Performance Scale

I meet the official performance requirements expected out of a student.
I adequately complete assigned duties.
I fulfill responsibilities specified (e.g., study, homework, readings, papers) in the course outline.
I perform tasks that are expected of me.
My performance is beyond demands.

Note . Items are rated on a 7-point scale, ranging from 1 (*do not agree at all*) to 7 (*very strongly agree*).

Appendix D

The Big Five Inventory

Scale:

The Big Five Inventory (BFI)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree Strongly
1	2	3	4	5

I see Myself as Someone Who...

____1. Is talkative

____2. Tends to find fault with others

____3. Does a thorough job

____4. Is depressed, blue

____5. Is original, comes up with new ideas

____6. Is reserved

____7. Is helpful and unselfish with others

____8. Can be somewhat careless

____9. Is relaxed, handles stress well

____10. Is curious about many different things

____11. Is full of energy

____12. Starts quarrels with others

____13. Is a reliable worker

____14. Can be tense

____15. Is ingenious, a deep thinker

____16. Generates a lot of enthusiasm

____17. Has a forgiving nature

____18. Tends to be disorganized

____19. Worries a lot

____23. Tends to be lazy

____24. Is emotionally stable, not easily upset

____25. Is inventive

____26. Has an assertive personality

____27. Can be cold and aloof

____28. Perseveres until the task is finished

____29. Can be moody

____30. Values artistic, aesthetic experiences

____31. Is sometimes shy, inhibited

____32. Is considerate and kind to almost everyone

____33. Does things efficiently

____34. Remains calm in tense situations

____35. Prefers work that is routine

____36. Is outgoing, sociable

____37. Is sometimes rude to others

____38. Makes plans and follows through with them

____39. Gets nervous easily

____40. Likes to reflect, play with ideas

____41. Has few artistic interests

Self Report Measures for Love and Compassion Research: *Personality*

Fetzer Institute

____20. Has an active imagination

____21. Tends to be quiet

____22. Is generally trusting

____42. Likes to cooperate with others

____43. Is easily distracted

____44. Is sophisticated in art, music, or literature

Scoring:

BFI scale scoring ("R" denotes reverse-scored items):

Extraversion: 1, 6R, 11, 16, 21R, 26, 31R, 36
Agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R, 42
Conscientiousness: 3, 8R, 13, 18R, 23R, 28, 33, 38, 43R
Neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39
Openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R, 44

Appendix E

Perceived Stress Scale

PERCEIVED STRESS SCALE

The questions in this scale ask you about your feelings and thoughts during the last month**. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.**

Name _____   Date _____

Age _____   Gender (*Circle*):   **M   F**   Other _____

0 = Never   1 = Almost Never   2 = Sometimes   3 = Fairly Often   4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
2. In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
3. In the last month, how often have you felt nervous and "stressed"?	0	1	2	3	4
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
5. In the last month, how often have you felt that things were going your way?	0	1	2	3	4
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
7. In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
8. In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
9. In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

mind garden

info@mindgarden.com
www.mindgarden.com

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