

**The Moderating Effect of Coping Strategies on the Relationship Between Academic  
Stress and Burnout Symptoms**

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## **Abstract**

### **Background**

University students are dealing with a variety of challenges, triggering academic stress and promoting the risk of suffering from burnout symptoms. In this relationship, coping strategies can play an important role.

### **Aim**

The present study aimed to examine the moderating effect of coping strategies on the relationship between academic stress and burnout symptoms.

### **Methods**

130 university students participated in this online survey study. The Student Life Challenges Scale (SLCS) was used to get an overall score of academic stress, while the Maslach Burnout Inventory-Student Survey (MBI-SS) investigated burnout symptoms in three dimensions, including exhaustion, cynicism, and personal inefficacy. The Brief-COPE assessed different coping strategies categorised into the three broader coping styles problem-focused, emotion-focused, and avoidance coping. While problem-focused coping is seen as adaptive and avoidance coping as maladaptive, such classification is not clearly made for emotion-focused coping.

### **Results**

The results suggested a lower moderate level of academic stress and a high burnout level only for exhaustion. While academic stress and exhaustion revealed a strong positive relationship, avoidance coping was found to act as a moderator between academic stress and cynicism. Generally, academic stress and avoidance coping were related to higher levels in all burnout dimensions.

### **Conclusion**

Reducing students' engagement in avoidant coping can prevent academic stress and symptoms of burnout symptoms. Thus, in line with the relevant role of maladaptive coping in relation to academic stress and burnout symptoms, it is recommended to promote less use of these coping strategies and thereby, increase well-being and academic success among students.

*Keywords:* university students, academic stress, burnout, coping

## **The Moderating Effect of Coping Strategies on the Relationship Between Academic Stress and Burnout Symptoms**

Experiencing constant stress can have tremendous impacts on students' well-being. Based on how students deal with stress, not only anxiety (Reddy et al., 2018) but also the experience of burnout symptoms can follow major stressful events (Clark et al., 2009). The Covid-19 pandemic has been a major source of stress as it has made life difficult for many people (Burns et al., 2020). Requiring significant restrictions in their daily routines, people were forced to reduce their social contacts and change their usual routines. This can be a stressful experience (Aslan et al., 2020). In the face of this new situation, people were increasingly suffering from mental health issues and declines in their well-being (Burns et al., 2020). Especially students were affected by these restrictions since, for example, classes primarily continued online instead of on campus. The aftermath of the pandemic shows that young adults are still affected by the lockdown and suffer from concerns such as depression and anxiety (Fernández-Castillo, 2021; Li et al., 2022). Students tend to be highly susceptible to mental health concerns, indicating a higher risk for depression than the general population (Sheldon et al., 2021). Beyond the impediments of the pandemic, however, students are already dealing with a number of academic-related challenges that are putting them under enormous stress. According to Li et al. (2022), academic stress represents a major source of pressure experienced by students. These, in turn, affect their mental health as well as their academic success (Li et al., 2022).

Academic stress can be defined in terms of challenges to students' life and how they evaluate and react to those in the course of their studies (Lee & Larson, 2000, as cited in Reddy et al., 2018). The external stressors are wide-ranging and emerge from different sources. Despite the pressure caused by the experienced need to succeed and fear of failure (Fialho et al., 2021), students usually perceive faculty shortcomings as quite stressful too, implying that they think they might not get sufficiently prepared for the future (Porru et al., 2021). Adding to that, students already tend to worry about the amount of work associated with their aspired profession (Porru et al., 2021). Fialho et al. (2021) emphasised that students feel some uncertainty regarding their future which promotes this feeling of stress. While being exposed to excessive amounts of workload and lacking the relevant balance between work and life, they might often miss social support or struggle with negative relationships with teachers and other peers (Porru et al., 2021). However, students might also feel unhappy with their choice of study, whereas financial worries too, significantly contribute to stress in students.

Such stress raises the risk of getting burnt out. Burnout is a frequent consequence of persistent exposure to student life challenges (Clark et al., 2009) and constitutes three dimensions (Maslach, 2015). These are emotional exhaustion, cynicism and personal inefficacy (Maslach, 2015). While emotional exhaustion implies a state in which students' own psychological and physical resources become drained so that they experience a loss of energy, cynicism comprises the inability to be emotionally involved in their studies. This dimension is also referred to as depersonalisation because it includes having negative feelings or being somewhat distant towards one's work. Maslach & Leiter (2008) claimed that cynicism usually follows exhaustion as a way of distancing oneself from the job to avoid the experienced feelings of exhaustion. Lastly, students suffering from burnout tend to doubt their own self-worth and capabilities (Maslach, 2015). In regard to their studies, they are thus prone to feel inadequate and less successful. These feelings are part of the personal inefficacy dimension. According to this definition of burnout, Gil-Calderón et al. (2021) specified symptoms such as being unable to concentrate, having trouble sleeping, or indicating physical complaints like headaches. Hence, burnout has detrimental impacts on students' academic performance as well as further mental health issues (Brooke et al., 2020).

While burnout is triggered by a range of stressors, coping appears to influence its occurrence (Brooke et al., 2020). Students make use of coping strategies in order to alleviate the pressure brought by the feelings of stress. When students fail to deal with stressful situations, burnout is often the result. Thus, possessing strategies for coping with academic stress can prevent its development (Gil-Calderón, 2021). In line with that, Reddy et al. (2018) claim that while stress can serve a motivating purpose for students to get productive, it is detrimental if it is not effectively dealt with. Because people can apply a variety of coping strategies, these can be classified as either adaptive or maladaptive (Guszkowska & Dąbrowska-Zimakowska, 2022). While certain strategies prove to be effective in restoring one's physical and cognitive resources, and combating feelings of stress, others can worsen its effects on people's mental health. Such strategies can be further separated into problem-focused, emotion-focused, and avoidance coping (Dias et al., 2012). When the first one is applied, students actively strive to change the situation leading to positive mental health outcomes. This is, for instance, often done by positive reframing. Avoidance coping, on the other hand, tends to be less efficient. It is more passive and is associated with poor mental health, particularly with burnout (Gibbons, 2010). Lastly, emotion-focused coping is about managing one's emotions related to stressors (Buchanan, 2023). This coping style cannot be said to have solely negative or positive impacts on students' mental health. Many researchers

only use the division in problem-focused and emotion-focused coping since avoidance coping is considered to be a form of emotion-focused coping (Dias et al., 2012).

Students are significantly at risk of facing declines in their well-being. Because they cope with a variety of stressors that are either directly related to their studies or to other aspects of their life (Porru et al., 2021), a common consequence are burnout symptoms. According to Guszowska & Dąbrowska-Zimakowska (2022), social distancing and not being able to go on campus decreased students' well-being enormously. As moving from the school to university setting can be already quite demanding for them (Burns et al., 2020), this change in their learning environment had implied a shift from their normal life (Guszowska & Dąbrowska-Zimakowska, 2022). During times of the Covid-19 pandemic, students were requested to participate in online classes. The target group within the current research will therefore consist of university students pursuing a bachelor's, master's, or a PhD degree.

Students appeared to suffer higher stress levels during the pandemic than usual (Aslan et al., 2020; Babicka-Wirkus et al., 2021). Gündoğan (2022) claimed that despite the several restrictions brought by the Covid-19 pandemic, also concerns related to the disease promoted feelings of distress among students. This major change posed a significant threat to students' mental health and academic achievements (Gündoğan, 2022). The increase in depression in response to academic stress during the pandemic appeared to be striking. Requested changes in students' life raised the risk of burnout. Switching to online education can be a demanding experience for many students, increasing their perceived stress and consequent burnout symptoms (Burns et al., 2020; Gündoğan, 2022). Having to adjust to the restrictions and adapt to changes in one's daily practices can be overwhelming, stimulating even more stress (Babicka-Wirkus et al., 2021). In addition to that, a common source of stress for students concerns their work and study. The pandemic contributed to their fear of experiencing worsened material conditions due to growing numbers of unemployment.

Aslan et al. (2020) highlighted the potential of stress to elicit burnout and in line with that, they suggested that as a result of the heightened stress prevalence, incidents of burnout could increase in the future. Overall, there is a strong relationship between academic stress and symptoms of burnout (Brooke et al., 2020; Clark et al., 2009). In a study conducted on medical residents, a group prone to a variety of stressors, Hillhouse et al. (2000) found that developing burnout symptoms is a frequent reaction to perceived stress. Importantly, it was shown that with rising stress levels, burnout levels were also getting notably higher (Hillhouse et al., 2000). This not only led to the participants scoring lower on well-being but also interfered with their academic performance. According to the findings by Brooke et al.

(2020), not being able to effectively cope with the arising stress makes students especially vulnerable to burnout. Based on his research, Gibbons (2010) highlighted that the application of adaptive coping strategies can promote students' mental health by reducing the chance of developing feelings of burnout.

As the occurrence of such experiences has a detrimental impact on students' academic performance and further worsens their mental health, it is critical to target this issue. The relationship between academic stress and burnout symptoms has been subject to various studies. While the effects of coping on students' well-being were also discussed by several researchers, only a few focused on it specifically moderating the relationship between stress and burnout. By concentrating on its moderating role, it will be assessed how the adoption of coping strategies influences the occurrence of burnout symptoms which are related to experienced stress. Hence, the impact that stress has on feelings of burnout is assumed to depend on the extent to which coping strategies are adopted. Due to the ambiguous classification of emotion-focused coping (Dias et al., 2012), one aim of this paper is to find out if emotion-focused coping leads to more positive or negative outcomes and based on that, if it can be considered adaptive or maladaptive. The current research also serves the purpose of replicating the existing findings in other countries (Babicka-Wirkus et al., 2021). Furthermore, however, it is interesting to look closer at the situation after the Covid-19 pandemic. The aim of devoting more extensive work to this topic is to ensure the well-being of studying young adults and improve their chances of achieving academic success. Therefore, the relationship between academic stress and burnout should be further investigated as well as the moderating influence of coping strategies on this relationship. By understanding the role of the different factors, students can be supported in dealing with stress to prevent the consequence of getting burnout.

The current research is aimed at investigating feelings of academic stress and burnout symptoms in university students. Three important questions will be addressed concerning the relationship between academic stress and burnout symptoms. More specifically, the first research question is focused on academic stress: "To what extent do university students experience academic stress?". The second question refers to burnout symptoms among university students: "To what extent do university students experience symptoms of burnout?". In line with that, the third research question seeks to ensure that academic stress is related to symptoms of burnout: "To what extent is academic stress related to symptoms of burnout?". Examining these questions forms the basis for answering the following research question: "To what extent does coping with academic stress moderate the relationship

between academic stress and the experience of burnout symptoms in university students?"

This question is central to the present research since the focus is on the moderating effect of coping strategies on the relationship between academic stress and symptoms of burnout. It is expected that maladaptive coping with stressors promotes the manifestation of feelings of burnout. Contrary, it is suggested that adaptive coping strategies lessen the negative impacts of the perceived stress and thus, prevent feelings of burnout.

## **Method**

### **Design**

The purpose of this study was to find out to what extent university students experience academic stress and following burnout symptoms. It was a collaborative work of five students who each had an individual focus on a further variable. They examined different research questions independently which are all related to academic stress and feelings of burnout in students. In line with that, the present paper primarily aimed at establishing the importance of coping strategies in moderating the relationship between academic stress and symptoms of burnout. For this reason, a questionnaire was carried out on a sample consisting of university students asking them to rate themselves on these aspects. Based on the gathered data, the research questions were answered.

### **Participants**

161 university students initially participated in the survey study. Due to the exclusion criteria, specifying students who did not give their consent, who have no sufficient understanding of the English language, who do not study at a university, who are under the age of 18 years, who did not answer seriously indicating a pattern in their responses, and who did not finish the survey, 31 respondents had to be omitted. More precisely, the 31 respondents were excluded because they did not complete all questions. Consequently, the final sample was left with 130 participants aged between 18 and 39 years in total.

An overview of the demographic characteristics of the sample can be found in Table 1. More than half of the sample consisted of females (75.38%). Studying at either a Dutch or German university, the majority of subjects were German (52.31%). Moreover, approximately half of the sample studied Psychology (48.46%). The largest group of the participants were currently in the third year of their bachelor while overall, 109 of the 130 student respondents were pursuing a bachelor's degree (83.85%). Their starting year ranged from 2012 to 2023, with the largest group of the respondents starting in 2020 (33.85%). Most participants studied at the University of Twente.



The sample that took part in the survey study was obtained through voluntary sampling. They were recruited from the own social network via the social media platforms Instagram and Facebook, as well as through Sona Systems. Sona Systems is an online research management system that rewards students who participate in a research with study credits. The participation in this study was entirely voluntary for all respondents.

**Table 1**  
*Demographic Characteristics of the Sample*

Sample Characteristics	<i>n</i>	%	<i>Mean</i>	<i>SD</i>
Age			21.5	2.33
Gender				
Male	31	23.85		
Female	98	75.38		
Non-binary	1	0.77		
Nationality				
Dutch	43	33.08		
German	68	52.31		
Other	19	14.62		
Study programme				
Psychology	63	48.46		
Communication Science	21	16.15		
Other	46	35.38		
Study phase				
Bachelor year 1	29	22.31		
Bachelor year 2	32	24.62		
Bachelor year 3	48	36.92		
Master year 1	12	9.23		
Master year 2	3	2.31		
Other	6	4.62		
Starting year of study				
2020	44	33.85		
2021	30	23.08		
2022	32	24.62		
Other	24	18.46		
University				
University of Twente	90	69.23		
Other	40	30.77		

## **Materials**

The different scales were compiled into one questionnaire. Participants were presented with an information sheet and consent form that disclosed the aim and purpose of the research, ethical concerns, how their data will be handled and, moreover, it informed them about their voluntary participation. Contact information was provided for further questions. Because the survey was a collaborative work with different focuses, it initially included seven scales with 142 items in total, whereas 66 items were relevant to the present study. Despite the 66 items resulting from the three scales used in this study, the questionnaire asked students for demographics including their age, gender, and nationality as well as for other background characteristics such as their pursued study programme, their starting year, the phase of their study they are currently in and the university they study at. An overview of the complete survey with all three scales used in this study and with the informed consent can be found in Appendix A.

### ***Academic Stress***

To examine the students' experienced academic stress, the Student Life Challenges Scale (SLCS) as used by Porru et al. (2022) was used (see Appendix A). This scale entails six subscales from the Higher Education Stress Inventory that were back-translated to assess different student life challenges (Dahlin et al., 2005, as cited in Porru et al., 2022). With a total number of 22 items, these subscales include Faculty Shortcomings (e.g., "The teachers often fail to clarify the aims of the activities."), Worries About Future Competence (e.g., "The long hours and responsibilities of my future career worry me."), Unsupportive Climate (e.g., "There is a competitive attitude among students."), High Workload ("The pace of study is too high."), Low Commitment (e.g., "I am satisfied with my choice of career.") and lastly, Financial Concerns ("As a student, my financial situation is worrying.") (Porru et al., 2022). Low Commitment did not appear to be an appropriate measure of academic stress but rather resembled cynicism which is part of burnout. Due to that, it was decided to exclude this subscale from further analyses. Hence, five subscales with 20 items in total were used. While Faculty Shortcomings comprises seven items with Cronbach's  $\alpha = .60$  in this study, Unsupportive Climate has five items with Cronbach's  $\alpha = .71$ . Worries About Future Competence with Cronbach's  $\alpha = .64$  and High Workload with Cronbach's  $\alpha = .77$ , each have three items, whereas Financial Concerns consists of two items. For this subscale, Spearman's rank correlation coefficient was calculated with  $\rho = .65$ ,  $p < .05$ . Based on the reliability coefficients from the present study, all subscales indicated sufficient reliability. In their study

on a sample of 568 students, Porru et al. (2022) demonstrated good reliability with Cronbach's  $\alpha = .74$  for Faculty Shortcomings, Cronbach's  $\alpha = .67$  for Worries About Future Competence, Cronbach's  $\alpha = 0.65$  for Unsupportive Climate and Cronbach's  $\alpha = .68$  for High Workload. Additionally, Spearman's rank correlation revealed  $\rho = .49$ ,  $p < .05$  for Financial Concerns (Porru et al., 2022). The items are scored on a four-point Likert scale that ranges from 1 ("totally disagree") to 4 ("totally agree"). Total subscale scores are calculated on the basis of the mean of the specific items. Higher values on the individual subscales imply the increased experience of the respective student life challenge.

### ***Burnout***

The Maslach Burnout Inventory-Student Survey (MBI-SS) by Schaufeli et al. (2002) was adopted to investigate feelings of burnout in students on the basis of the three dimensions defined by Maslach (2015) (see Appendix A). According to that, all concepts relevant to this definition are covered in the MBI-SS. The questionnaire therefore constitutes 15 items divided in three subscales (Schaufeli et al., 2002). Because the first two subscales, Exhaustion and Cynicism, respectively consist of five and four items, the last one, Personal Efficacy, is left with six items. The items are scored on a seven-point Likert scale from 0 ("Never") to 6 ("Everyday"). Here, high scores on Exhaustion (e.g., "I feel emotionally drained by my studies.") and Cynicism (e.g., "I doubt the significance of my studies.") imply feelings of burnout. For Personal Efficacy (e.g., "In my opinion, I am a good student."), in contrast, low scores indicate the presence of burnout. The items of the Efficacy subscale are therefore reverse coded, then indicating personal inefficacy. Based on the respective items, mean scores can be computed for each subscale and hence, higher scores on the subscale represent the occurrence of burnout symptoms. The psychometric properties of the MBI-SS from the present study emphasised strong reliability with the Exhaustion subscale indicating Cronbach's  $\alpha = .90$ , the Cynicism subscale indicating Cronbach's  $\alpha = .91$  and the Personal Inefficacy subscale showing Cronbach's  $\alpha = .70$ . Schaufeli et al. (2002) conducted a study on a sample of 309 Dutch undergraduate students where they found similar results with Cronbach's  $\alpha = .80$  for Exhaustion, Cronbach's  $\alpha = .86$  for Cynicism and Cronbach's  $\alpha = .67$  for Personal Inefficacy.

### ***Coping***

Designed to measure students' coping behaviour in response to their perceived stressors, the Brief-COPE questionnaire (Carver, 1997), which is a short version of the COPE, was applied (see Appendix A). It examines a range of relevant strategies in terms of adaptive and maladaptive coping. In total, 14 coping strategies are assessed with 28 items which makes

two items per coping strategy. These coping strategies include active coping, planning, positive reframing, acceptance, humour, religion, using emotional support, using instrumental support, self-distraction, denial, venting, substance use, behavioural disengagement and finally, self-blame. They can be categorised into more general coping styles albeit there is no way of categorisation that is universally applied in all studies. Based on the work by Buchanan (2023), Dias et al. (2012) and Poulus et al. (2020), three general coping styles are used in this research, which are problem-focused coping, emotion-focused coping, and avoidance coping. Problem-focused coping is considered to be adaptive (Buchanan, 2023). Although avoidance coping can be regarded as a form of emotion-focused coping (Dias et al., 2012), these two subscales differ to some extent (Buchanan, 2023). Thus, avoidance coping represents maladaptive coping whereas emotion-focused coping cannot be assigned to only one of the two categories since it entails strategies considered as either adaptive or maladaptive (Buchanan, 2023; Dias et al., 2012). With eight items for each subscale, the Problem-Focused Coping subscale comprises active coping, instrumental support, positive reframing, and planning, whereas the Emotion-Focused Coping subscale entails emotional support, venting, humour, acceptance, religion, and self-blame. The Avoidance Coping subscale is with eight items therefore composed of self-distraction, denial, substance use, and behavioural disengagement. The items are answered on a four-point Likert scale ranging from 1 (“I usually don't do this at all”) to 4 (“I usually do this a lot”) where higher scores are indicative of the frequent use of a specific coping strategy (Gibbons, 2010). While Carver et al. (1989) intended to come up with 14 individual scores for each coping strategy, scores can also be computed for the three broader strategies (Dias et al., 2012). In line with this, total subscale scores can be calculated based on the sum of the respective items. In this study, all three general coping styles displayed good reliability, with Cronbach's  $\alpha = .83$  for Problem-Focused Coping, Cronbach's  $\alpha = .76$  for Emotion-Focused Coping and Cronbach's  $\alpha = .73$  for Avoidance Coping. These values add to the outputs of Poulus et al. (2020) who denoted Cronbach's  $\alpha = .81$  for Problem-Focused Coping, Cronbach's  $\alpha = .75$  for Emotion-Focused Coping and Cronbach's  $\alpha = .68$  for Avoidance Coping

### **Procedure**

In line with the cross-sectional study design, a questionnaire was created and published online. The complete survey was distributed online via Qualtrics (<https://www.qualtrics.com>) to make it accessible to the student participants. First, however, it had to be submitted to the Behavioural, Management and Social Sciences (BMS) Faculty of the University of Twente for ethical review. The online survey was published online after it

had been confirmed by the BMS ethics committee and ethical approval was obtained. The sample that took part in the questionnaire was reached through SONA systems or invited through social media channels such as Instagram and Facebook. Participants could access the online survey through a link leading them to Qualtrics. After reading the information sheet, the respondents first had to give their informed consent in order to be able to proceed with completing the questionnaire (see Appendix A). Once they had agreed with the information, they were expected to fill out the different scales. Following the last scale, the participants were asked about how they had perceived the clarity of the survey questions. To conclude the participation, respondents were provided with a debriefing sheet containing important information related to the research, contact information of the researchers as well as useful sources of emotional support if needed after the study. While the online survey was published on 21 March 2023, the data collection procedure was terminated on 17 April 2023. The data obtained from the participants was anonymised and securely saved, and confidentially stored for further statistical analyses.

### **Data Analysis**

The present research aimed at providing answers to the following research questions:

1. Research question: “To what extent do university students experience academic stress?”.
2. Research question: “To what extent do university students experience symptoms of burnout?”
3. Research question: “To what extent is academic stress related to symptoms of burnout?”.
4. Research question: “To what extent does coping with academic stress moderate the relationship between academic stress and the experience of burnout symptoms in university students?”

In order to answer these questions, descriptive and statistical analyses were conducted with the software R Studio. Prior to the analysis, the data had to be filtered and prepared by removing the start date, end date, status, progress, duration, completion status, recorded date, response id, distribution channel and user language. Descriptive statistics provided an overview of the demographic data by summarising them in means, standard deviations, frequency distributions, and percentages. To determine the reliability of the scales, Cronbach’s  $\alpha$  or Spearman’s rank correlation coefficients were computed for the respective subscales.

Considering the SLCS, a mean score could be calculated for each of the subscales. An exploratory factor analysis was conducted to determine underlying factors in the data. Hence, it was assessed whether the five individual subscale scores would load on the same factor and based on that, if the academic stress variables could be reduced by combining them.

Before conducting the factor analysis, preliminary tests were performed to ensure the suitability of the data for factor analysis. While the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was computed to establish the presence of underlying factors in the set of variables, Bartlett's test of Sphericity examined whether the variables were indeed related. Similarly, for the MBI-SS, mean scores were calculated for the different subscales and Spearman's Rank Correlation was then determined between the three subscales to confirm that they intended to measure different dimensions of burnout. The same procedure was also applied to the three subscales of the Brief COPE to examine if the subscales indeed measured distinct aspects of coping.

In order to examine the distribution of the data and test for normality, the residuals were visualised in histograms. In addition, the Shapiro-Wilk test was used to provide the p-values for ensuring normality, requiring  $p > 0.05$ . Scatterplots were created to investigate the linearity assumption of the variables. Therefore, the relationship between each predicting variable and the dependent variables was separately plotted. Following that, mean scores and standard deviations could be calculated for the final variables, as well as Pearson correlations between the variables to investigate their relationships.

Eventually, for the statistical analysis of the data, regression analysis was conducted to gain insight into the moderating effect of coping on the relationship between academic stress and burnout. More specifically, moderation analysis was conducted on the basis of regression analysis. Academic stress was therefore employed as the independent variable and the burnout dimensions were implemented as the dependent variable, whereas the coping dimensions were implemented as the moderating variable. To prevent multicollinearity between the interaction terms and the predictor and moderator, the variables first needed to be centred by subtracting the respective mean scores from the variables. Because the sample was large enough, there was no need for bootstrapping the variables if the normality assumption should have been violated. Such an issue is addressed by the present sample size. Regression models were created based on the number of the final variables to test the several moderation effects on the dependent variable.

## Results

### Factor Analysis

Conducting the exploratory factor analysis on the SLCS measuring academic stress, the overall MSA value of the KMO measure, which represents the proportion of variance in the observed variables that can be explained by the underlying factors, was found to be 0.75. This value indicates a relatively high level of adequacy for factor analysis as it is above 0.6, suggesting that the data is suitable for further exploration. The results of Bartlett's test of sphericity revealed a significant p-value ( $p < .001$ ), providing evidence for substantial correlations among the stress variables, suggesting that the variables are not independent of each other and exhibit meaningful relationships. Hence, this also justified the decision to proceed with the factor analysis. The exploratory factor analysis conducted on the SLCS indicated a latent factor structure. It revealed one eigenvalue equal to 2.48 ( $>1$ ) which was substantially larger than the remaining eigenvalues that were all below the value of 1. The finding implying that a single factor accounted for a significant proportion of the total variance in the data could also be observed in the scree plot with the eigenvalues based on the elbow criterion. Additionally, the total variance explained by the one-factor solution was 38.3% (proportion variance = 0.38). Thus, the identified factor captured a substantial amount of the variability in the scale items. Based on these results, the exploratory factor analysis clearly emphasised that a one-factor solution provided the best fit to the data. The initial five separate variables Financial Concerns, High Workload, Unsupportive Climate, Worries About Future Competence, and Faculty Shortcomings could be grouped into one meaningful variable referred to as academic stress. This enabled the calculation of a total mean score for the SLCS. An overview of the factor loadings of the five stress subscales can be found in Appendix B.

### Spearman's Rank Correlation

For the MBI-SS, Spearman's correlation implied only weak to moderate correlations between exhaustion and cynicism ( $\rho = .43, p < .05$ ), exhaustion and personal inefficacy ( $\rho = .29, p < .05$ ), and cynicism and personal inefficacy ( $\rho = 0.52, p < .05$ ). Moreover, the subscales of the Brief COPE also only moderately correlated with each other, including the correlation between problem-focused coping and emotion-focused coping ( $\rho = .63, p < .05$ ), problem-focused coping and Avoidance Coping ( $\rho = .11, p < .05$ ), and emotion-focused coping and Avoidance Coping ( $\rho = 0.41, p < .05$ ). Therefore, while there is some level of association between the subscales, this highlighted that they capture different dimensions of burnout and coping. The final set of seven variables that was used within the current study

included Academic Stress as the independent variable, Problem-Focused Coping, Emotion-Focused Coping and Avoidance Coping each as a separate moderating variable, and Exhaustion, Cynicism and Personal Inefficacy each as a separate dependent variable.

### **Assumptions Test**

The histograms displayed approximately normal distributions for Academic Stress ( $p = 0.07$ ), Personal Inefficacy ( $p = 0.2$ ), Problem-Focused Coping ( $p = 0.25$ ), and Emotion-Focused Coping ( $p = 0.21$ ), while Exhaustion, Cynicism, and Avoidance Coping did not follow a normal distribution ( $p < .05$ ) which demonstrated skewed curves, thus indicating some violation of the normality assumption. Additionally, scatterplots visualising the relationships between the predicting variables and the dependent variables mainly revealed a moderate positive linear relationship for several pairs of variables. However, for other pairs, the scatterplots did not show a clear linear pattern due to the violation of the normality assumption. These pairs primarily entail Problem-Focused Coping and Exhaustion, Problem-Focused Coping and Cynicism, Problem-Focused Coping and Personal Inefficacy, Emotion-Focused Coping and Exhaustion, Emotion-Focused Coping and Cynicism, and Emotion-Focused Coping and Personal Inefficacy. They exhibited departures from linearity, which may be attributed to the non-normal distribution of the respective variables. Hence, the linearity assumption was also only partially met. The issues of normality and linearity violation were accounted for by the further analysis. The histograms for the normality check and the scatterplots for the linearity test are captured in Appendix C and Appendix D.

### **Correlations and Means of Academic Stress and Burnout Variables**

To answer the first research question “To what extent do university students experience academic stress?”, the mean score and standard deviation were calculated for the Academic Stress variable. The mean scores and standard deviations for all final variables are provided in Table 2. Since the SLCS ranged from 1 to 4, the theoretical mean was 2.5. The observed mean in the sample revealed that, on average, university students in the study scored modestly lower on Academic Stress compared to this theoretical mean of the scale (see Table 2).

In line with the second research question “To what extent do university students experience symptoms of burnout?”, mean scores and standard deviations also had to be assessed for the three burnout variables Exhaustion, Cynicism, and Personal Inefficacy. Possible scores ranged from 0 to 6 for all variables which is why the theoretical mean of the scales was equal to 3. Compared to this value, the participants, on average, exhibited a moderately higher mean score on Exhaustion. In contrast, the mean scores on Cynicism and



Personal Inefficacy were both lower than the theoretical mean of 3. The standard deviations suggest some variability in the responses within the sample, with some students reporting higher levels of the respective burnout variable and others reporting lower levels.

Means were also calculated for the application of the different coping strategies. Because respondents could have possibly scored between 1 and 4, the theoretical means were 2.5. The sample mean scores for Problem-Focused Coping and Emotion-Focused Coping were, on average, close, but slightly above, to this theoretical mean. On Avoidance Coping, however, students expressed a mean score below the theoretical mean and similarly, lower than on the other two dimensions of coping.

The third research question “To what extent is academic stress related to symptoms of burnout?” was addressed by investigating the Pearson correlation coefficients to determine the relationship between the Academic Stress and burnout scores. The exact Pearson correlations for the final variables can be found in Table 2. Academic Stress and Exhaustion were significantly strongly positively correlated (see Table 2), suggesting that higher levels of academic stress are associated with higher levels of exhaustion. Similarly, the correlation between Academic Stress and Cynicism was found to be moderately strong positive (see Table 2). This correlation is also confirmed to be statistically significant by the observed p-value. Hence, higher levels of academic stress are associated with higher levels of cynicism. For Academic Stress and Personal Inefficacy, a somewhat lower correlation coefficient was detected (see Table 2). The coefficient between the two variables still indicated a significant moderate positive correlation. In line with that, higher levels of academic stress are associated with higher levels of personal inefficacy. Since all correlations were significantly positive and at least moderate, it can be established that as levels in academic stress increase, levels in all dimensions of burnout do so as well.

**Table 2***Means, SD and Pearson Correlations for the Stress, Burnout and Coping Variables*

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1. Academic stress	2.30	0.48	–						
2. Exhaustion	3.11	1.52	.61**	–					
3. Cynicism	1.62	1.64	.52**	.47**	–				
4. Personal inefficacy	1.98	1.03	.39**	.29**	.47**	–			
5. Problem-focused coping	2.76	0.62	-.15	.01	-.09	-.38**	–		
6. Emotion-focused coping	2.58	0.52	.21*	.32**	.18*	-.01	.60**	–	
7. Avoidance coping	1.91	0.51	.31**	.45**	.39**	.31**	.07	.37**	–

*Note.* \* $p < .05$ , \*\* $p < .01$

### Regression Analysis

By conducting regression analysis, the fourth research question “To what extent does coping with academic stress moderate the relationship between academic stress and the experience of burnout symptoms in university students?” was examined. Given the final variables for academic stress, coping, and burnout, three regression models were created. The moderation effects of the predicting variables on Exhaustion can be found in Table 3, the effects on Cynicism are displayed in Table 4 and those on Personal Inefficacy in Table 5.

**Table 3**

*Regression Model for the Moderation Effect of Stress and Coping on Exhaustion*

Effect	Estimate	SE	t-value	p	95% CI	
					LL	UL
Intercept	0.01	0.11	0.10	.92	-0.20	0.23
Academic stress	1.57	0.23	6.81	3.95e-10	1.11	2.02
Problem-focused coping	0.01	0.22	0.05	.96	-0.42	0.44
Emotion-focused coping	0.26	0.28	0.93	.35	-0.30	0.82
Avoidance coping	0.82	0.22	3.64	.0004	0.37	1.26
Problem-focused coping:academic stress	-0.64	0.42	-1.52	.13	-1.47	0.19
Emotion-focused coping:academic stress	0.47	0.59	0.79	.43	-0.71	1.64
Avoidance coping:academic stress	-0.85	0.54	-1.57	.12	-1.92	0.22

*Note.*  $R^2 = 0.45$ ,  $F(7, 122) = 16.19$ ,  $p < .001$

First, the effects on Exhaustion were examined (see Table 3). Academic Stress was found to be significantly positively related to Exhaustion. A significant positive main effect on Exhaustion was also detected for Avoidance Coping but not for the other coping variables. These effects highlight that higher scores on Academic Stress or Avoidance Coping are

associated with higher scores on Exhaustion. The tested interaction effects were all insignificant and thus, none of the coping variables appeared to have a significant moderation effect in the relationship between Academic Stress and Exhaustion.

**Table 4**

*Regression Model for the Moderation Effect of Stress and Coping on Cynicism*

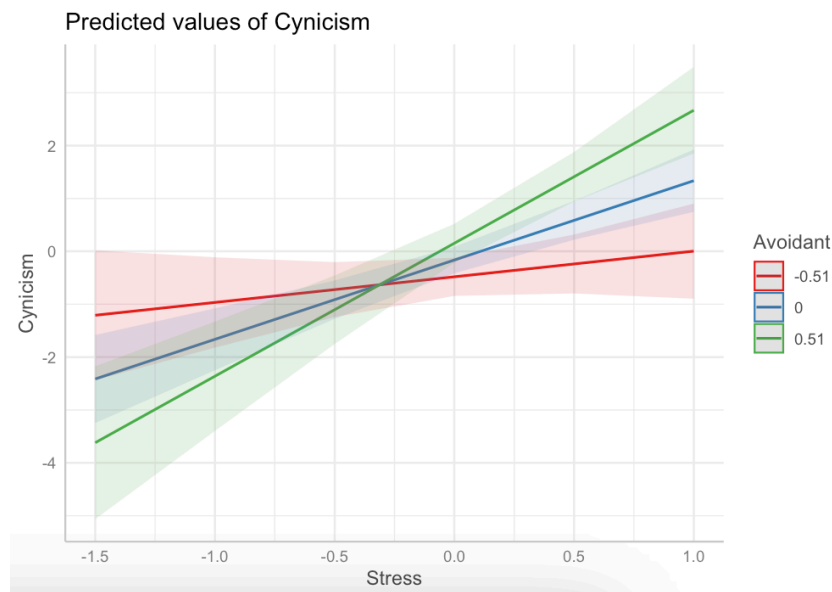
Effect	Estimate	SE	t-value	p	95% CI	
					LL	UL
Intercept	-0.16	0.13	-1.30	.20	-0.41	0.09
Academic stress	1.50	0.27	5.60	1.36e-07	0.97	2.03
Problem-focused coping	-0.12	0.26	-0.46	.64	-0.62	0.39
Emotion-focused coping	0.15	0.33	0.46	.65	-0.50	0.80
Avoidance coping	0.62	0.26	2.38	.02	0.11	1.14
Problem-focused coping:academic stress	-0.37	0.49	-0.76	.45	-1.34	0.60
Emotion-focused coping:academic stress	-0.03	0.70	-0.04	.97	-1.40	1.34
Avoidance coping:academic stress	2.00	0.63	3.16	.002	0.74	3.24

*Note.*  $R^2 = 0.36$ ,  $F(7, 122) = 11.5$ ,  $p < .001$

Investigating the effects on Cynicism (see Table 4), Academic Stress and Avoidance Coping also had a significant positive main effect on Cynicism. Moreover, a significant strong positive interaction effect was found between Academic Stress and Avoidance Coping on Cynicism, highlighting that the relationship between Academic Stress and the outcome depends on the level of Avoidance Coping. A visualisation plotting the interaction effect can be seen in Figure 1. The three lines in the plot indicate this relationship for different levels of Avoidance Coping, suggesting that the positive relationship between Academic Stress and Cynicism is stronger for people who score high on Avoidance Coping compared to people low in Avoidance Coping.

**Figure 1**

*Significant Interaction Effect for Academic Stress and Avoidance Coping on Cynicism*

**Table 5**

*Regression Model for the Moderation Effect of Stress and Coping on Personal Inefficacy*

Effect	Estimate	SE	t-value	p	95% CI	
					LL	UL
Intercept	0.009	0.08	-0.11	.92	-0.18	0.16
Academic stress	0.51	0.18	2.83	.005	0.15	0.86
Problem-focused coping	-0.72	0.17	-4.21	4.9e-05	-1.05	-0.38
Emotion-focused coping	0.25	0.22	1.14	.26	-0.19	0.69
Avoidance coping	0.43	0.17	2.46	.02	0.08	0.77
Problem-focused coping:academic stress	-0.02	0.33	0.06	.95	-0.66	0.63
Emotion-focused coping:academic stress	-0.14	0.46	0.30	.76	-1.05	0.77
Avoidance coping:academic stress	0.20	0.42	0.49	.63	-0.63	1.04

Note.  $R^2 = 0.28$ ,  $F(7, 122) = 8.27$ ,  $p < .001$

The third regression model concerned the effects on Personal Inefficacy (see Table 5). While it revealed that Academic Stress and Avoidance Coping were significantly positively related to Personal Inefficacy, it also emphasised a significant main effect for Problem-Focused Coping. The main effect of Problem-Focused Coping on Personal Inefficacy, however, proved to be negative. This implies that higher scores on Problem-Focused Coping are associated with lower scores on Personal Inefficacy.

Based on the regression outputs, Academic Stress, as well as Avoidance Coping, indicated significant positive main effects on all three dimensions of burnout. The only significant interaction effect concerned the relationship between these two variables. While the remaining interactions differed in whether they demonstrated positive or negative coefficients, they all turned out to be insignificant. A significant coefficient would indicate that the specific coping dimension moderated the relationship between Academic Stress and the respective burnout dimension. In line with that, Avoidance Coping proved to be the only dimension of coping that moderated the relationship between Academic Stress and burnout. More specifically, however, this significant moderation effect only concerned one dimension of burnout, namely Cynicism. Thus, a moderation effect of coping on the relationship between academic stress and burnout can be confirmed for this specific dimension.

## **Discussion**

### **Summary of the Findings**

The current research had the purpose to investigate the role of coping in the relationship between academic stress and burnout symptoms. By addressing the first research question, the extent of academic stress in university students was assessed. The participants, on average, reported a moderate level of academic stress, as they only scored modestly below the theoretical mean. Therefore, students were modestly exposed to the investigated student life challenges. Similarly, the aim of the second research question was to determine the extent of burnout symptoms in university students. Compared to the moderate level of Exhaustion, with students scoring modestly above the theoretical mean, lower levels were detected for Cynicism and Personal Inefficacy. Considering this finding, the participants only displayed a moderate level for one out of the three burnout dimensions, Exhaustion, whereas they had lower levels on the remaining two, Cynicism and Personal Inefficacy. Moderate levels of Problem-Focused Coping and Emotion-Focused Coping demonstrated the moderate application of these coping dimensions, whereas the low level of Avoidance Coping was indicative of the low use of this coping style.

The third research question examined the relationship between academic stress and burnout symptoms in university students. Overall, the findings revealed that higher levels of Academic Stress are associated with higher scores on all dimensions of burnout, albeit to varying degrees. Increased levels of Academic Stress were strongly related to higher levels of Exhaustion, moderately strong to higher levels of Cynicism, and moderately to higher levels of Personal Inefficacy.

Finally, the moderation effect of coping on the relationship between academic stress and the experience of burnout symptoms in university students was tested. In line with that, the level of Avoidance Coping was found to be influencing the relationship between Academic Stress and one dimension of the burnout variable, Cynicism. The association of Academic Stress on Cynicism is suggested to be stronger among students who displayed higher levels of Avoidance Coping compared to those with lower levels. While it was found that higher levels of Academic Stress were associated with higher levels in all burnout dimensions, higher levels of Avoidance Coping were also indicated to be related to increased levels in all three outcomes. Interestingly, the results highlighted an important association between Problem-Focused Coping and Personal Efficacy, suggesting that increased levels in this coping dimension were related to decreased levels of Personal Inefficacy.

### **Interpretation of the Findings**

Based on the established norm scores by Brenninkmeijer and Van Yperen (2003; as cited in Galán et al., 2011), the participants of the current study exhibited a high level of exhaustion symptoms, whereas they indicated an average level of symptoms associated with cynicism. However, these norm scores were drawn from a Spanish working population using the general survey and not the student version of the MBI. Therefore, the study by Galán et al. (2011) rather offers an indication of what might be seen as high or low levels in their student population using the MBI-SS compared to the suggested norms. Because the cut-off points for the third subscale were defined for Personal Efficacy (Brenninkmeijer and Van Yperen, 2003; as cited in Galán et al., 2011), and not the reverse scored scale Personal Inefficacy, as was used in this study, interpreting this score appears somewhat difficult. The observed scores in the present study might indicate a low to average level of Personal Inefficacy and consequently, an average to high score on the originally formulated Personal Efficacy dimension. Thus, while high levels of exhaustion and average levels of cynicism were found in the student participants, it could be suggested that the students disclosed a low to average level of personal inefficacy symptoms since they generally scored below the middle of the theoretical range of scores. Nevertheless, there is no clear classification into one of the three

levels due to the missing guidelines. In line with their definition, Galán et al. (2011) claimed that burnout can be detected when students report a high score on exhaustion or on cynicism, while they attributed a less important role to personal efficacy in this assessment.

Accordingly, the ambiguous interpretation of the score on this subscale should not significantly affect the identification of burnout. The high exhaustion level in the students suggests that they suffered an increased lack of energy and feel drained by their studies (Maslach, 2015). Therefore, the average level of cynicism reveals that the students established a distance between themselves and the studies to some extent due to increased negative feelings, while cynicism still was relatively less prevalent compared to exhaustion. The potentially low to average level of personal inefficacy, however, might imply that the students were generally somewhat confident about their individual competencies and academic achievements.

For Academic Stress, the interpretation of the scores is somewhat more complicated due to lacking consensus on norm scores. Comparable scores can be drawn from other studies using the SLCS. Deviating only slightly from the theoretical mean, the participants of the current study disclosed a moderate stress level. Because Porru et al. (2022), on the other hand, separately investigated the life challenges that are part of the SLCS, they came up with individual levels for each challenge. These were generally close to the theoretical mean as well (Porru et al., 2022). A striking observation is yielded by the mean score of the Low Commitment subscale in their research, which indicated a relatively low level. In this study, it was decided to exclude low commitment since it does not appear to be an adequate measure of academic stress. This decision could be supported by the mean score revealed by Porru et al. (2022). Nevertheless, whether levels of academic stress are considered average or high, experiencing student life challenges tends to negatively affect university students' well-being (Porru et al., 2022). Because similar levels were reported in this research study, it is critical to take this issue into account. In the present study, elevated levels of academic stress were strongly related to higher levels of exhaustion, and moderately to higher levels of cynicism and personal inefficacy. Being increasingly exposed to the examined student life challenges goes hand in hand with the increased risk of feeling depleted by one's studies. The potential average to high levels of exhaustion and cynicism might underscore the relevance of the observed level of stress, as it seems sufficient to trigger negative effects on students' well-being.

Because the association of academic stress and cynicism was found to be stronger in university students with higher levels of avoidance coping than with lower levels, it can be



said that engaging in this coping style further raises the levels of cynicism. Besides this important interaction effect, another finding suggested that increased engagement in problem-focused coping was linked to decreased levels of personal inefficacy. Hence, related to increased feelings of personal efficacy, this highlights that students feel more confident about their competencies when making use of problem-focused coping. It is important to note, however, that it might also be the case that students who are more confident make more use of problem-focused coping.

Since researchers refer to different definitions and categorisations of the examined coping concepts, the largely insignificant interaction effects obtained from the analysis could be explained by the fact that most researchers made use of categories different from those in this study. According to Carver (1997), however, the Brief COPE can be adjusted to the individual needs of a researcher. Guskowska & Dąbrowska-Zimakowska (2022), for instance, categorised the 14 coping styles measured through 28 items into four broader coping dimensions. Because of the various options of categorisation, there appears to be lacking consensus about what is the most appropriate approach to divide the concepts into smaller dimensions and assign the respective items to these. Nevertheless, avoidant coping proved to have an important role in moderating the relationship between academic stress and cynicism. In line with that, the higher the engagement in avoidance coping, the stronger the positive relationship between academic stress and cynicism. Overall, applying avoidance coping was associated with higher levels of cynicism, exhaustion, and personal inefficacy.

Specifying that those high in emotional exhaustion feel drained, the observed level of exhaustion and academic stress in this study may indicate that the students indeed tend to suffer from significant challenges resulting from their academic demands. Since cynicism is associated with expressing negative feelings towards one's studies, and personal inefficacy with perceiving oneself as inadequate, the lower to average levels on these dimensions might infer that students generally do not have such strong negative feelings. It may therefore also imply that these students still attempt to take part in their studies to a certain level.

Furthermore, the lower levels of personal inefficacy may be a result of engaging in effective coping. Moderate use was revealed for problem-focused coping, considered to be adaptive and related to decreased inefficacy. Moderate use was also shown for emotion-focused coping, which can, depending on the situation, either be adaptive or maladaptive. By examining the relationship between emotion-focused coping and academic stress in the present study, it can be observed that an increase in one of the variables is linked to an increase in the second variable. Therefore, these positive relationships might suggest a

possible maladaptive trend of emotion-focused coping. A direct relationship between emotion-focused coping and the burnout dimensions could not be established in the present study.

In their study on Spanish medical students, Galán et al. (2011) observed an average level in each of the three burnout dimensions. Similar to the findings of the present study, Rank & de la Ossa (2021) found high exhaustion levels and lower efficacy levels in European chiropractic students. The low levels of efficacy, however, are in contrast to the present findings which indicated lower levels of personal inefficacy, hence, moderately higher efficacy. While they used a different measure of stress than the SLCS, Rank & de la Ossa (2021) concluded that the students demonstrated increased levels of stress and burnout. Because Aslan et al. (2020) revealed higher stress levels during the Covid-19 pandemic, they suggested that the experienced stress among students might increase the risk of burnout in the future. The high levels of exhaustion and the average levels of cynicism found in this study are in line with this suggestion by Aslan et al. (2020).

Highlighting the maladaptive role of avoidance coping, Gibbons (2010) found out that avoidance coping acts as a strong predictor of burnout symptoms, especially for exhaustion. He argued that coping in an avoidant style is usually related to declines in people's mental well-being (Gibbons, 2010). Its adverse impact on well-being was also detected in the present study as the interaction between avoidance coping and academic stress was associated with elevated levels of cynicism. Moreover, making use of avoidance coping alone significantly related to cynicism as well as exhaustion and personal inefficacy, indicating that higher levels of this coping style related to increased levels in all burnout dimensions and thus, reduced well-being. Generally, consistent with the research findings of Gibbons (2010), maladaptive coping, as in the form of avoidance coping, was proven to be related to the experience of burnout symptoms, whereas adaptive coping, through applying problem-focused coping strategies, was associated with lower levels of personal inefficacy.

Because the use of problem-focused coping was related to increased efficacy in this study, it can be seen as an adaptive coping style in relation to this burnout dimension. Adding to these outcomes, Babicka-Wirkus et al. (2021) claimed that applying maladaptive coping increases the risk of suffering from long-term consequences on one's psychological well-being. While they referred to a categorisation of two coping dimensions, problem-focused and emotion-focused coping, their study revealed a stronger preference for emotion-focused coping in the students (Babicka-Wirkus et al., 2021). Ntoumanis et al. (1999; as cited in Dias et al., 2012) associated elevated levels of well-being with problem-focused coping, consistent

with the adaptive function of this coping style. In this study, problem-focused coping revealed the adaptive effect only on personal inefficacy, implying that it was associated with raised feelings of efficacy among the students.

Emotion-focused is not clearly assigned to either label but some researchers suggest that it has a maladaptive inclination (Babicka-Wirkus et al., 2021; Dias et al., 2012). Babicka-Wirkus et al. (2021) argued that venting and denial, for example, are ineffective in response to experienced stress. Although in the current study denial was part of avoidance coping, their claim can be related to the present classification as well since avoidance coping is usually seen as a form of emotion-focused coping that some might prefer to use separately (Dias et al., 2012). Therefore, items included in avoidance coping are commonly part of emotion-focused coping. Adding to this point, Dias et al. (2012) explained that, in addition to avoidance coping, emotion-focused coping was related to negative psychological and academic outcomes too. In the present study, emotion-focused coping did not exhibit any significant effect on any of the burnout variables, but a significant relationship could still be established with academic stress. Based on that, this study did provide further insights into how emotion-focused coping could be more clearly classified. The findings suggest a tendency towards a maladaptive nature in this debate due to the positive relationship between emotion-focused coping and academic stress. An important claim noted by Dias et al. (2012), however, suggests that under specific circumstances, strategies initially considered to be maladaptive can serve adaptive purposes.

### **Implications**

The current study makes important contributions to the understanding of this field of research. The levels found for academic stress and burnout call for targeted interventions that aim at preventing high levels of stress due to exposure to student life challenges, and burnout symptoms among university students. In line with that, the role of problem-focused coping in relation to personal efficacy suggests that encouraging students to use adaptive coping strategies could significantly reduce feelings of inadequacy and promote their self-esteem. The results suggest that engaging in problem-focused coping reduces the manifestation of symptoms of personal inefficacy. Contrary, according to the finding emphasising a stronger effect of academic stress on cynicism for those with higher levels of avoidance coping, students using avoidance coping strategies may be at a higher risk for increased levels of cynicism following increasing stress. Irrespective of the level of academic stress, however, the use of an avoidant coping style already appears to be a risk factor for burnout. When exposed to stressful situations, such students may become susceptible to denying the situation

or consuming substances to avoid dealing with it. The academic environment that the students are in should be a supportive one to counteract students becoming drained by their studies. Furthermore, due to the distinct outcomes for the burnout components, the study supports the classification of multiple burnout dimensions. Thus, the different burnout dimensions differ in how they are related to the application of the various coping strategies, enabling valuable insights into the development of individual burnout symptoms.

### **Limitations**

Regardless of its valuable contributions, this study raises some limitations that may have influenced the results. First, it needs to be taken into account that the data was obtained through self-report measures. This type of measurement is usually at risk of triggering response biases. Individuals' understanding of the questions is subjective and therefore tends to differ depending on how they perceive and interpret the information. The questionnaire asked participants about personal experiences. For a variety of reasons, however, students may have chosen response options that might not actually reflect their true experiences. Deviating from the probably more correct response option, participants might, for instance, opt for responses that they may perceive as socially acceptable. On the other hand, participants might as well simply struggle with accurately recalling the required information from their memory. Despite the downsides of self-report measures, they offer a quick and easy way to access the subjective experiences of students in large-scale studies.

The second limitation concerns the generalisability of the research findings to the population of university students. In line with that, the sample consisted of university students only studying at either a German or a Dutch university. Due to the narrow focus on the individual countries, the majority of university locations were excluded. Not only was the variation of regions impeded but also the sample size was affected by the specific inclusion criteria, potentially leading to smaller samples and hence, limiting the generalisability of the findings drawn from the sample. Furthermore, the sample is not representative of the population because a convenience sample was used and participants were not randomly selected from the student population.

Third, the lack of consensus among researchers to refer to uniform conceptual categories of coping complicates the study of this field of research. Their use of different definitions of coping styles limits the comparability of findings among different studies. Nevertheless, as Carver (1997) suggested for his Brief COPE, researchers can adjust the assessment to their specific needs. In addition, the choice of categories was based on prior research that already worked with these. On the other hand, there are no norm scores for the

SLCS that can be used to compare the observed scores from this study which limits the adequate interpretation of the academic stress levels.

Lastly, another limitation is that the present study does not allow for drawing conclusions about causality. Due to the fact that a one-time measurement was conducted, it is not possible to determine which variable caused changes in the other. The levels of the participants might fluctuate over time but the actual levels before and after the measurement are not known in this research. Yet the study revealed critical insights into the overall relationships between the investigated variables. It could be established that changes in levels of certain variables are indeed associated with changes in others.

### **Future Research**

In order to address these limitations, it is recommended that future studies employ more diverse samples. Because this study only focused on students studying in Germany or the Netherlands, it might be interesting to investigate other regions in or out of Europe. Students might experience stressors and challenges differently based on their region, leading to different research findings. As the sample of the current study mainly entailed students from the same university, however, it might also be interesting to have a more representative study of the Netherlands and Germany alone. Another important recommendation suggests that more research should be conducted using the same categorisation of coping styles as in the current study. This is also needed to strengthen the validity of the present findings. By comparing different regions based on the same measurement, further valuable insights could be gained. Including more students from other countries would simultaneously account for the generalisability of the findings. Moreover, because no inferences could be made about the direction of the relationships between the variables in this study, future research should attempt to establish causality. One way to do this is by conducting longitudinal studies because data from the same student participants can be obtained at multiple time points. Researchers can thus investigate changes over time in the variables of interest. To build on the findings of the present study, implying that there are important relationships, more focus should be devoted to analysing the observed relationships in the future.

According to the findings of Gibbons (2010), older students indicated lower levels of exhaustion compared to their younger fellow students because they might substantially differ in their ways of coping. It might be interesting to look at the differences among the students in more detail and devote more consideration to these differences and their causes. Furthermore, Babicka-Wirkus et al. (2021) pointed out that the choice of a certain coping strategy could be also associated with the gender of individuals or with where they live. As they suggested that,

for example, females more frequently tended to emotional support strategies when coping with stress, while males might rather refer to humour (Babicka-Wirkus et al., 2021), it might be intriguing to inspect these gender differences in the application of specific coping strategies. In line with that, it could be explored why individuals choose certain coping strategies over others. Researchers could aim at figuring out how to influence people's choice of strategies in order to minimise the adverse effects on well-being brought by maladaptive coping.

### **Conclusion**

Despite the suggested limitations, the present paper enabled relevant insights that contribute to our understanding of the complex interplay between academic stress, the use of coping strategies, and burnout symptoms. Students experiencing higher levels of academic stress were found to be susceptible to higher levels in all dimensions of burnout symptoms. Considering the role of coping strategies, avoidance coping did not only prove to be a significant moderator between academic stress and cynicism, but also irrespective of academic stress, avoidance coping alone already seems to be a risk factor for burnout symptoms on all dimensions. Similarly, students engaging in emotion-focused coping tend to face higher levels of academic stress. The maladaptive coping styles indicated a variety of negative effects in this study. Because engaging in problem-focused coping only showed one meaningful effect on burnout, implying an increase in personal efficacy, it can be assumed that the role of adaptive coping is only a minor one in this study. On the other hand, however, the findings suggest that it appears to be more important that maladaptive coping is related to higher academic stress and higher burnout levels.

The findings of the current research support the existing literature, pointing out that avoidance coping, but also emotion-focused coping, can be a threat to students' well-being. In line with that, less use of maladaptive coping strategies has the ability to prevent burnout symptoms and feelings of academic stress. Disregarding their actual level, the consequences of experienced stress and burnout can be detrimental. It is of great importance to anticipate signs of such symptoms and address them to guarantee psychological health and academic success among students. On the basis of these findings, it seems crucial to focus on promoting not to use emotion-focused coping but more primarily, to refrain from avoidant coping.

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## Appendix A

### *Complete Survey Including the Informed Consent*

#### **Participant Information Sheet & Consent Form**

##### Purpose and Procedure

The purpose of this study is to gain further information about the academic stress levels that university students experience, the potential influence of these stress levels on burnout symptoms experienced by students, and related factors. It is important to research these factors as university students have been shown to experience stress which influences their academic performance and well-being.

If you choose to participate in this study, you will be asked to fill out questions with regard to these variables.

##### Risk, anonymity & confidentiality

We believe there are no major risks associated with this research study beyond the chance that some items may feel uncomfortable to think about, or lead you to recall upsetting situations. We are minimising the risk of a data breach by anonymising all of your information and storing it in a secure way. Your answers in this study will be treated confidentially; they will not be shared with other parties than the researchers and their supervisor.

##### Contact

If you have any questions or concerns, you can contact the following people:

First Supervisor: Erik Taal (e.taal@utwente.nl)

Second Supervisor: Luisa Reiter (l.c.reiter@utwente.nl)

Alexa Schulze (a.schulze@student.utwente.nl)

Eda Selin Özkan (e.s.ozkan@student.utwente.nl)

Iris Antoinette Ruel (i.a.ruel@student.utwente.nl)

Iris Maria van den Heuvel (i.m.vandenheuvel@student.utwente.nl)

Jonah Justin Shepherd (j.j.shepherd@student.utwente.nl)

### Participant rights & consent

Your participation in this study is entirely voluntary. You are free to decline to participate, omit any question, or you can withdraw from the study at any time without the need to give a reason.

Clicking “I agree and consent to participate in this study” indicates that:

- you have been informed about the nature and method of this research in a manner that is clear to you,
- you have read this page thoroughly,
- you voluntarily agree to participate in this study
- you are 18 years of age or older

- I agree to participate in this study
- I do not agree to participate in this study

### Demographic Information

Firstly, we would like to gather some demographical data from you. Please answer the following questions.

How old are you?

How would you describe yourself?

- Male
- Female
- Non-Binary / third gender
- Prefer to self-describe
- Prefer not to say

What is your Nationality

- Dutch
- German
- Others (please indicate)

In which phase of your study are you right now?

- Bachelor year 1
- Bachelor year 2
- Bachelor year 3
- Master year 1
- Master year 2
- Other:

Which study are you doing?

In what year did you start your study?

At which university do you study?

**Student life-challenges scale**

The following statements refer to challenges that you might encounter in your academic life. Please read the statements and indicate to what extent you agree with them.

	Totally disagree	Somewhat disagree	Somewhat agree	Totally agree
I feel that my teachers treat me with respect.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The teachers often fail to clarify the aims of the activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The study stimulates my personal development.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
As a student you are often expected to participate in situations where your role and function is unclear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am able to influence the studies or curriculum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is too much focus on passive learning of facts and too little on active seeking of knowledge and time for reflection.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that the training is preparing me well for my future profession.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am worried that I will not acquire all the knowledge needed for my future profession.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The long hours and responsibilities of my future career worry me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The insight I have had				

The insight I have had into my future profession has made me worried about the stressful workload.

Studying has created a climate of anonymity and isolation among the students.

The professional role presented in our course conflicts with my moral viewpoint.

There is a competitive attitude among students.

I feel that the studies have played a role in creating a cold and impersonal attitude among students.

It seems to me to be treated worse on the basis of my sex.

My study controls my life and I don't have a lot of time for other activities.

The literature is too difficult and extensive.

The pace of study is too high.

I am satisfied with my choice of career.

I am proud of my future profession.

As a student, my financial situation is worrying.

I am worried about my future financial situation and my

ability to pay off my student loans.

### Maslach Burnout Inventory-Student Survey



I believe that I make an effective contribution to the classes that I attend.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In my opinion, I am a good student.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel stimulated when I achieve my study goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have learned many interesting things during the course of my studies.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
During class I feel confident that I am effective in getting things done.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Brief-COPE**



The following questions ask how you have sought to cope with a hardship in your life. Read the statements and indicate how much you have been using each coping style.

	I haven't been doing this at all	A little bit	A medium amount	I've been doing this a lot
I've been turning to work or other activities to take my mind off things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been concentrating my efforts on doing something about the situation I'm in.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been saying to myself "this isn't real".	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been using alcohol or other drugs to make myself feel better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been getting emotional support from others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been giving up trying to deal with it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been taking action to try to make the situation better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been refusing to believe that it has happened.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been saying things to let my unpleasant feelings escape.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been getting help and advice from other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I've been using alcohol or other drugs to help me get through it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

through it.

I've been trying to see it in a different light, to make it seem more positive.

I've been criticizing myself.

I've been trying to come up with a strategy about what to do.

I've been getting comfort and understanding from someone.

I've been giving up the attempt to cope.

I've been looking for something good in what is happening.

I've been making jokes about it.

I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping.

I've been accepting the reality of the fact that it has happened.

I've been expressing my negative feelings.

I've been trying to find comfort in my religion or spiritual beliefs.

I've been trying to get advice or help from other people about what.

I've been learning to

live with it.

I've been thinking  
hard about what steps  
to take.

I've been blaming  
myself for things that  
happened.

I've been praying or  
meditating.

I've been making fun  
of the situation.

## Clarity

Were the questions clear and understandable for you?

Yes

No

What was unclear or not understandable?

## Debriefing Sheet

You just participated in a research study focussing on the influence of stress on university students. The aim of this study is to investigate both the potential relationship between the amount of stress experienced and the amount of burnout symptoms experienced by university students as well as factors influencing this relationship. The study is important as it allows for increased knowledge with regard to providing help to university students and people affected by stress. If reporting and thinking about these variables led to negative emotions, you can refer to the following resources to calm down or reach out for emotional support:

Calming Breathing Exercise

<https://www.thetrevorproject.org/breathing-exercise/>

For further guidance for dealing with stress, students studying at the University of Twente can go to:

-<https://www.utwente.nl/en/ces/sacc/well-being/>

-<https://canvas.utwente.nl/enroll/K9PNAR>

General support for Mental Health

If reporting about these variables caused strong psychological consequences, such as panic, distress, or strong anxiety, we recommend reaching out to your General Practitioner (Huisarts) to arrange adequate, professional support for your mental health.

Information regarding the research study

If you're interested in finding out more about this study or have any comments, you can contact the researcher(s) here:

First Supervisor: Erik Taal ([e.taal@utwente.nl](mailto:e.taal@utwente.nl))

Second Supervisor: Luisa Reiter ([l.c.reiter@utwente.nl](mailto:l.c.reiter@utwente.nl))

Alexa Schulze ([a.schulze@student.utwente.nl](mailto:a.schulze@student.utwente.nl))

Eda Selin Özkan ([e.s.ozkan@student.utwente.nl](mailto:e.s.ozkan@student.utwente.nl))

Iris Antoinette Ruel ([i.a.ruel@student.utwente.nl](mailto:i.a.ruel@student.utwente.nl))

Iris Maria van den Heuvel ([i.m.vandenheuvel@student.utwente.nl](mailto:i.m.vandenheuvel@student.utwente.nl))

Jonah Justin Shepherd ([j.j.shepherd@student.utwente.nl](mailto:j.j.shepherd@student.utwente.nl))

**Appendix B***Results From the Exploratory Factor Analysis of the SLCS*

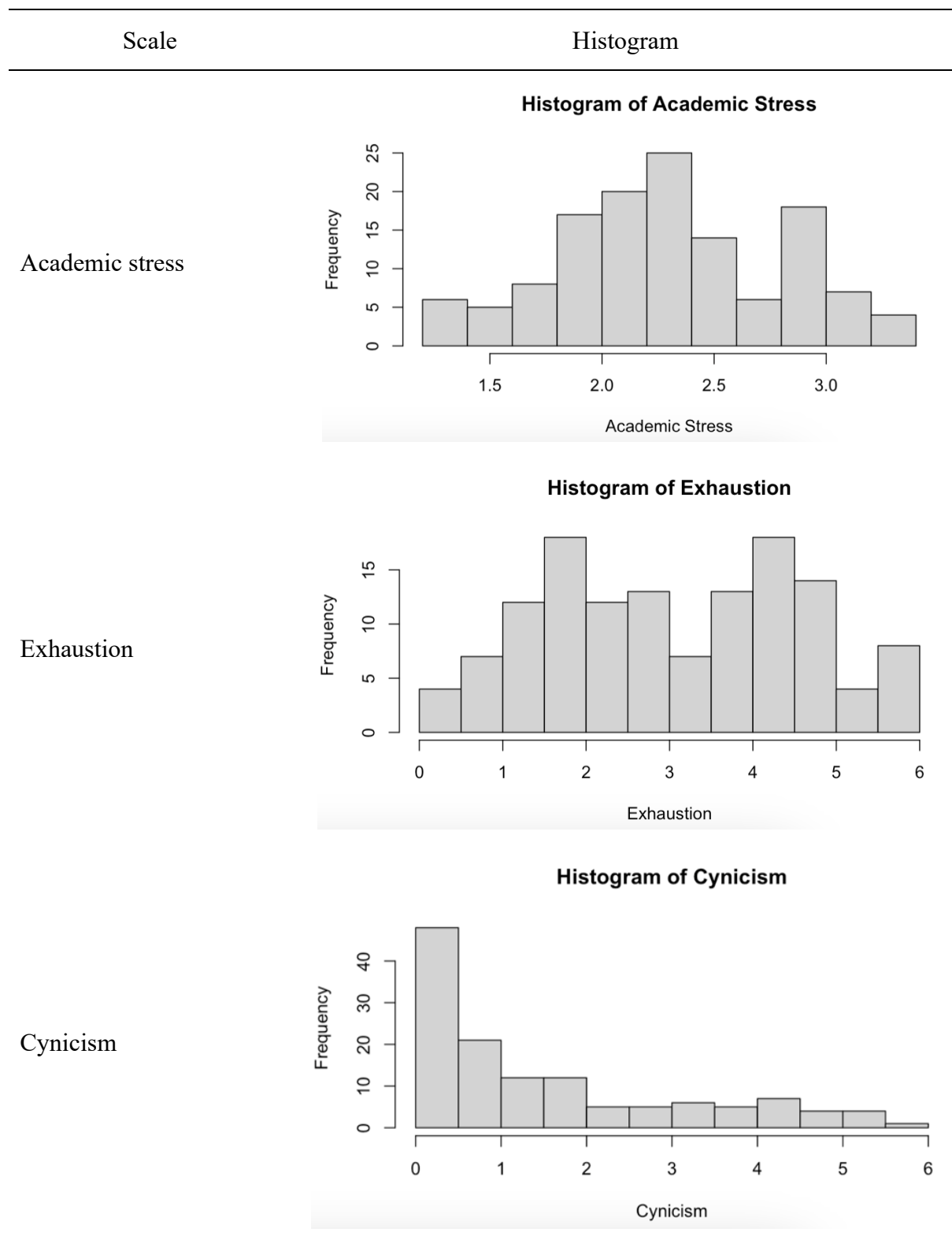
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SLCS Subscale	Factor Loading
Financial Concerns	0.33
High Workload	0.64
Unsupportive Climate	0.74
Worries about future competence	0.60
Faculty shortcomings	0.70

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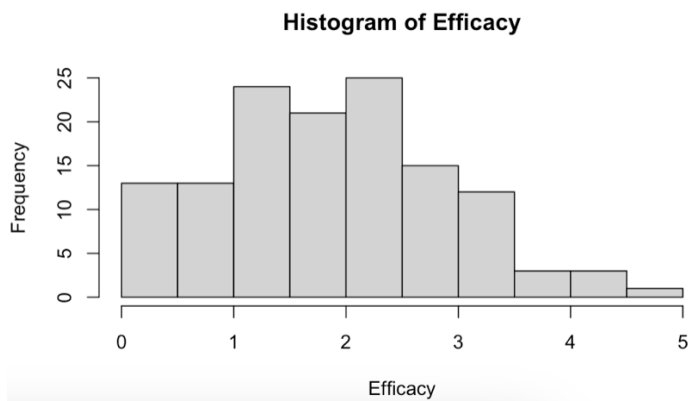
## Appendix C

*Table: Histograms of the Mean Distributions of the Stress, Burnout and Coping Variables*

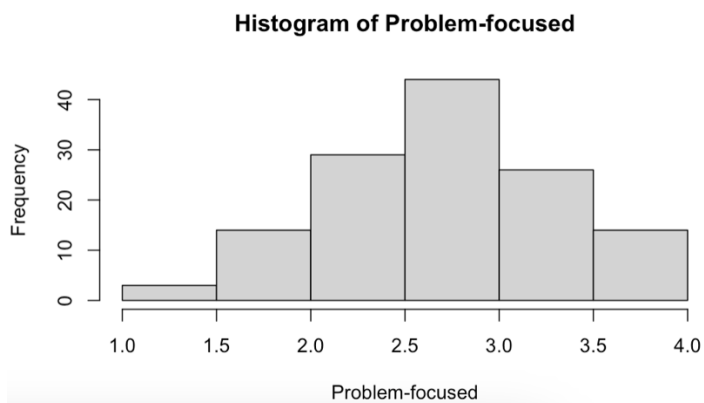


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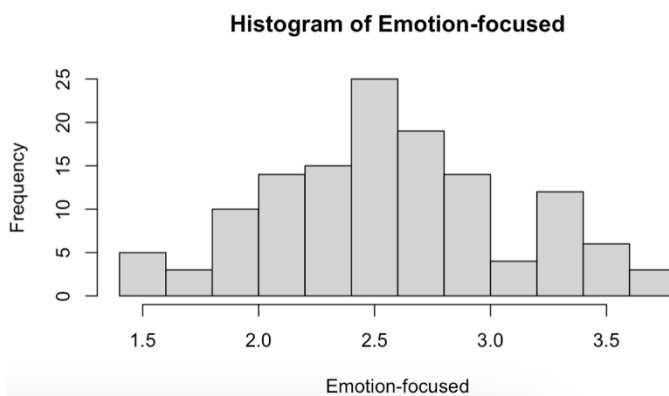
Personal inefficacy



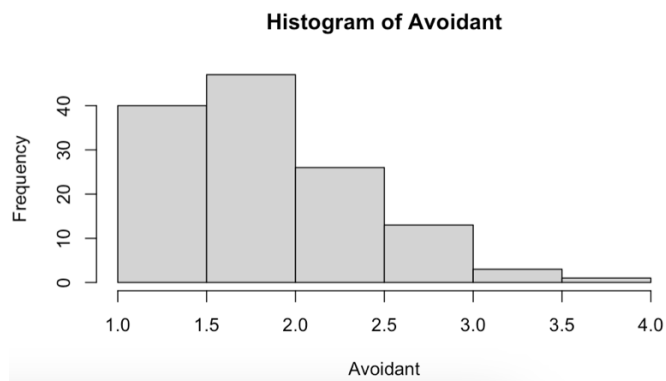
Problem-focused coping



Emotion-focused coping



Avoidance coping



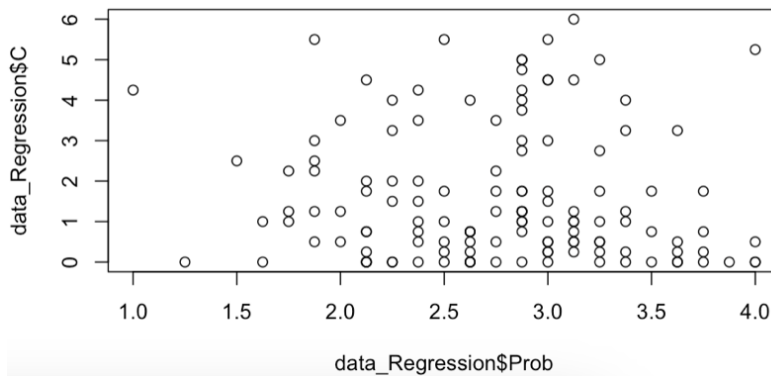


### Appendix D

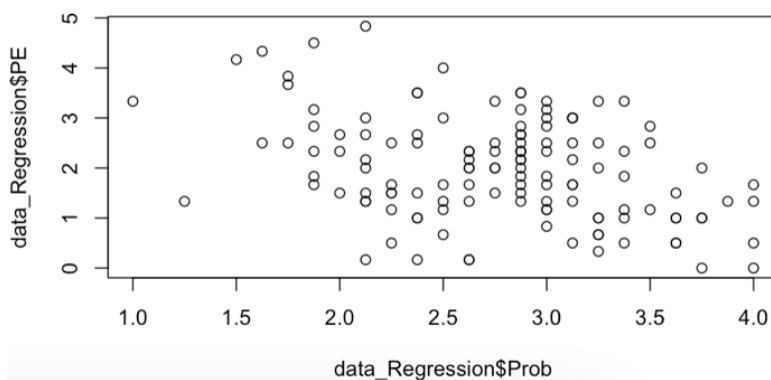
Table: Scatterplots Visualising the Relationship Between the Predicting and Dependent Variables

Relationship	Scatterplot
Academic stress:exhaustion	
Academic stress:cynicism	
Academic stress:personal inefficacy	
Problem-focused coping:exhaustion	

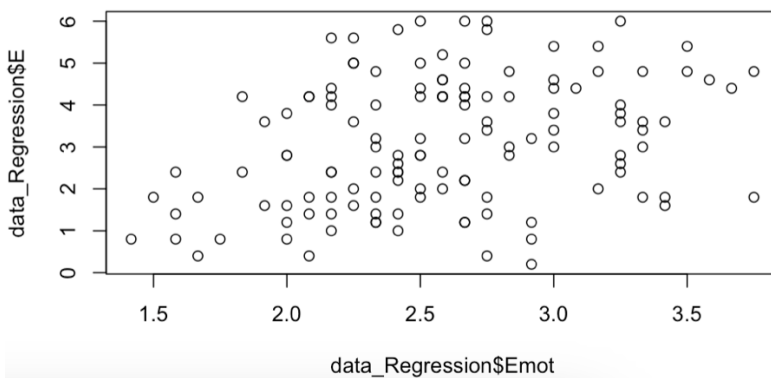
Problem-focused  
coping:cynicism



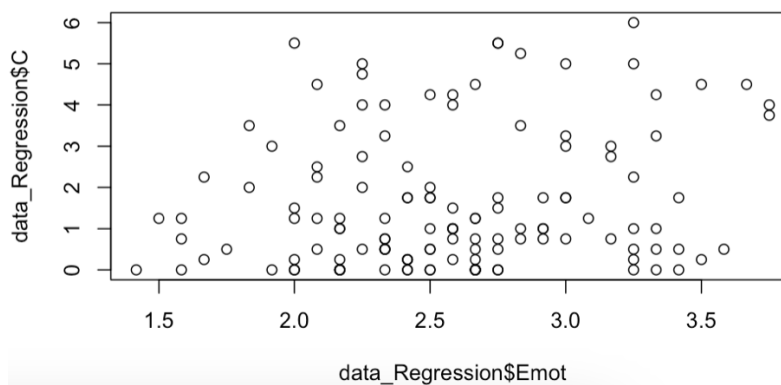
Problem-focused  
coping:personal  
inefficacy



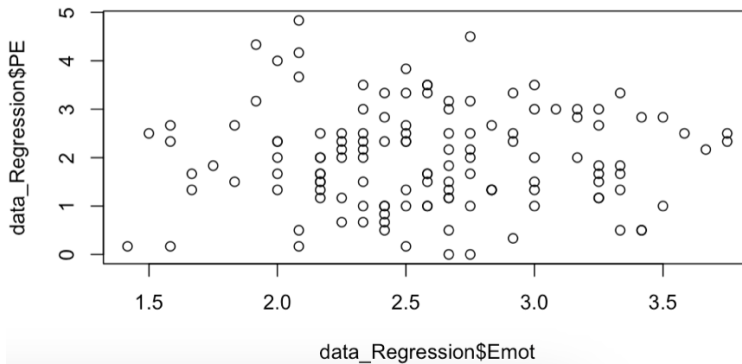
Emotion-focused  
coping:exhaustion



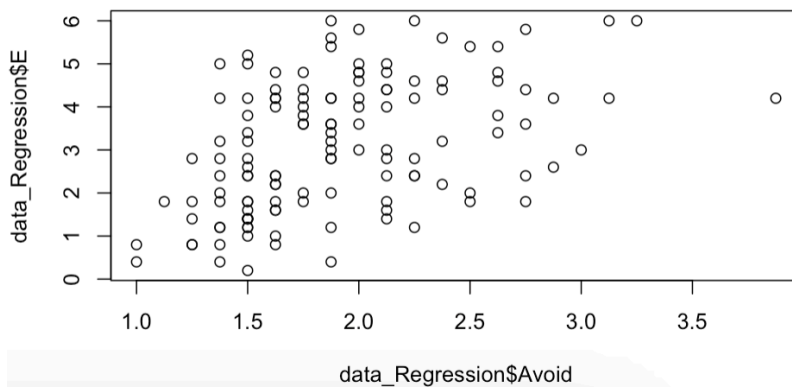
Emotion-focused  
coping:cynicism



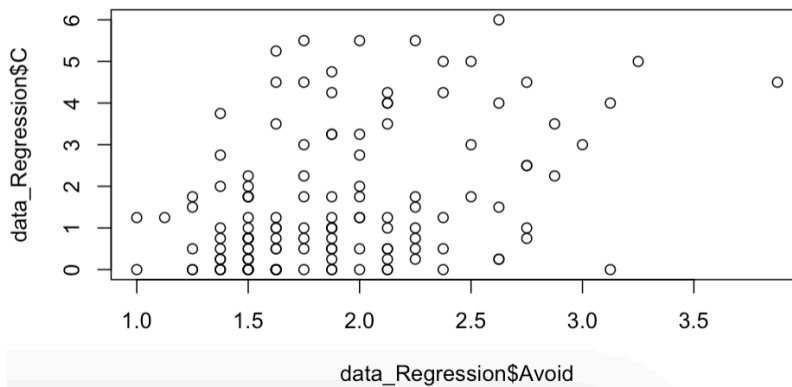
Emotion-focused  
coping:personal  
inefficacy



Avoidance  
coping:exhaustion



Avoidance  
coping:cynicism



Avoidance  
coping:personal  
inefficacy

