

Coping as the mediator between stress mindset and anxiety

A cross-sectional study

Julia Raquel Heermann
s1880012

Psychology Bachelor thesis 2018-2019
First supervisor: Dr Mirjam Radstaak
Second supervisor: Roos Wolbers
Enschede, 24th June 2019

**UNIVERSITY
OF TWENTE.**

Abstract

The present study investigated the association between stress mindset, three different coping styles (problem-focused, emotion-focused and avoidance-focused coping) and anxiety among students. It was expected that coping style mediates the relationship between stress mindset and anxiety. More specifically, three hypotheses have been established. The first hypothesis is, the negative association between a stress mindset and anxiety is mediated by problem-focused coping. Second, the negative association between stress mindset and anxiety is mediated by emotion-focused coping. Third, the negative association between stress mindset and anxiety is mediated by avoidance-focused coping. A cross-sectional study ($n = 104$) was conducted to explore the interaction between stress mindset, coping and anxiety. The sample included mostly undergraduate students from the University of Twente in their 20s. An online questionnaire including the state-trait anxiety scale assessed the anxiety levels, the stress mindset scale evaluated the stress mindset, and coping strategies inventory assessed the dominant coping style. The present study revealed the investigated coping styles not to be significantly mediating the relation between stress mindset and anxiety. All of the three hypotheses were rejected. Nevertheless, the three coping styles were significantly correlated with anxiety. The predictor, stress mindset was not found to have a significant association with the three coping styles and anxiety. Therefore, this study emphasised the need to conduct further research in the field of stress mindset and the association with anxiety.

Introduction

The high prevalence of anxiety and stress symptoms among university students is alarming (Bayram & Bilgel, 2008). Research has shown, 41.7% of the students reported moderate, severely or above levels of anxiety, and 27.1% reported levels of stress symptoms. Anxiety is a commonly experienced form of fear which can be described as a multidimensional concept including cognitive, affective, physiological and behavioural responses (Stojanovic et al., 2018). The fear response depends on the cause of the situation and many individual factors. Feeling of inner restlessness, timidity and concern are typical anxiety symptoms. A pathological fear is rarely related to real danger. It instead is an emotional response of the individual, inappropriate to the actual experience. A common cause of anxiety is stress. Especially students experience a variety of stressors related to categories including academic, financial, time or health (Misra & McKean, 2000). Anxiety being a common and debilitating issue for many students, research is needed to examine the precursors of anxiety to prevent it, such as coping.

Coping

Coping can be described as cognitions and behaviour people use to manage the effects of external and internal stressors (Horiuchi, Tsuda, Aoki, Yoneda & Sawaguchi, 2018). Coping behaviour aims to maintain psychological well-being and reduce stress-associated symptoms (Alharbi & Alshehry, 2019). According to Lazarus and Folkman's theory of stress and coping (1984), individuals pursue different coping strategies in response to stressful events. Even though the strategies might differ throughout their life or specific situations, individuals have a dominant coping approach across life situations (Lazarus & Folkman, 1984). Lazarus and Folkman (1984) identified two main coping strategies, problem-focused coping and emotion-focused coping. Problem-focused coping is an active approach trying to overcome the problem causing distress, for example, setting up a nutrition plan to lose weight. In contrast, emotion-focused coping aims at regulating the emotions associated with the stressor. For example, seeking emotional support by talking to a friend about the stressor. Another coping style that has been identified is avoidance-focussed coping (Kohn, Hay & Legere, 1994). It refers to the general behaviour of removing oneself mentally or even physically from the source of stress rather than actively coping with it or finding a solution. For example, increasing sleep hours or avoiding thinking about the problem (Kohn, Hay & Legere, 1994).

Past research from Dijkstra and Homan (2016) has investigated several coping strategies regarding their effectiveness in reducing the negative effect of stressors on well-being. The results suggested an avoidance coping style is associated with lower well-being in

contrast to more active approaches who face the stressor and/or its related emotions like problem-focused coping. Behavioural disengagement in the form of avoiding the stressor was shown to cause a lack of control during the stressful event as well as a lack of will to confront the stressor which is associated with poor well-being (Dijkstra & Homan, 2016). In the study of Mantzicopoulos (1990), students with active coping strategies were shown to have higher academic success and a higher sense of self-worth than those adopting a more defensive approach to coping with stress. Other previous studies supported the hypothesis that more direct action oriented coping strategies including emotion-focused and problem-focused coping behaviour are more effective in the prevention of negative consequences of stress than avoidance focused coping behaviours (Carver & Scheier, 1994). A study on depression among medical students revealed engagement in avoidant coping strategies lead to higher stress levels (Chao, 2011). In addition, the result of the study of Koeske, Kirk and Koeske (1993) revealed that active coping styles served as work stress buffers, whereas avoidance coping resulted in long-term negative consequences. Overall, previous research suggests, active coping styles are related to lower levels of stress and a better well-being than passive coping styles (Carver & Scheier, 1994; Chao, 2011; Dijkstra & Homan, 2016; Koeske, Kirk & Koeske, 1993).

Coping styles have been related to anxiety in previous research. The study of Chao (2011) revealed that social support, which is a form of emotion-focused coping, has a positive effect on psychological well-being. It has been shown to reduce perceived stress and its associated anxiety symptoms. In contrast, research on avoidance coping, which focuses more on relieving distress rather than actively dealing with the stressor, can provide short term relief, but if used inflexibly it leads to perpetuating fear, anxiety and high distress levels (Mennin, McLaughlin & Flanagan, 2009). Based on previous research, it is suggested an active coping style in stressful events, for example, emotion-focused and problem-focused coping is associated with lower levels of anxiety as in contrast to avoidance coping styles (Chao, 2011; Koeske, Kirk & Koeske, 1993; Mennin, McLaughlin & Flanagan, 2009). The way we cope with stress is influenced by the stress mindset we adopt (Crum, Akinola, Martin & Fath, 2017).

Stress Mindsets

In general, mindset can be defined as a framework people use to organise and interpret incoming information and experiences. The understanding and responses to life events and challenges are impacted and guided by the individual's' mindset (Crum & Langer, 2007). Stress mindset is a relatively new concept in the field of psychology. Previous studies measuring stress mindset suggest that stress mindset plays a vital role in perceiving health and evaluating life satisfaction

in stressful events (Crum, Salovey & Achor, 2013). Stress mindset can be categorised into two central beliefs, stress-is-enhancing mindset and stress-is-debilitating mindset. The former is based on the belief that stress has enhancing, thus positive effects, whereas the latter is based on the belief, it has a debilitating consequence (Horiuchi et al., 2018). The critical difference between both mindsets lies in the underlying belief about the nature of stress, which is not directly dependent on the specific situation (Jamieson et al., 2018). Research has shown, a stress-is-enhancing mindset produced an increase in positive affect and greater cognitive flexibility than a stress-debilitating mindset (Crum, Akinola, Martin & Fath, 2017). Having a more negative mindset towards stress can lead to worse cognitive and affective outcomes (Vanstone & Hicks, 2019).

Previous research has investigated how stress mindset is associated with coping and psychological stress responses (Crum et al., 2013; Crum et al., 2017; Kilby & Sherman, 2017). The findings of Crum and her colleagues (2013) highlighted stress mindset influences how individuals respond to stressors. Attempts of changing the mindsets from a stress-is-debilitating mindset to a stress-is-enhancing mindset were associated with positive consequences in terms of health and performance. The study of Horiuchi et al. (2018) examined the influence of stress mindset on coping and could not provide evidence that coping has a mediating effect on stress mindset and psychological responses. The study investigated the following coping styles, emotional expression, emotional support seeking, cognitive reinterpretation and problem-solving.

Currently, insight is lacking in the direct influence stress mindset has on the level of anxiety. The research of Jamieson et al. (2018) aimed at demonstrating how reappraisal and mindset interventions can optimise the stress response. The way people appraise stressors has shown to have a direct influence on their psychological and bodily responses to stress. Moreover, the study revealed anxiety symptoms, for instance, an elevated heart rate, are strongly linked to a stress-is-debilitating mindset. Therefore, people who evaluate stress as a threat rather than a challenge had increased physical symptoms related to anxiety. In conclusion, previous research comparing both stress mindset, revealed a stress-is-enhancing mindset is less associated with anxiety symptoms than a stress-is-debilitating mindset.

Present study

Recent research in contrast to older beliefs has emphasised the importance of optimising the stress response rather than trying to eliminate stress as the best way to cope with stress (Jamieson, Crum, Goyer, Marotta & Akinola, 2018). A growing body of research suggests

stress mindset can have a powerful in the evaluation and coping with stressors (Crum et al., 2013; Jamieson et al., 2018). As a positive mindset interprets stress as a challenge rather than a threat to oneself and associated with better cognitive and affective outcomes than a negative mindset interpreting stress as a threat (Crum et al., 2017). Even though there has been no particular successful coping style identified, some coping styles have been proven to be more helpful when coping with stress (Vanstone & Hicks, 2019). Especially active coping approaches as emotion-focused and problem-focused strategies had been associated with a higher level of well-being and lower level of perceived stress and anxiety in contrast to passive coping like avoidance-focused coping (Chao, 2011; Mennin, McLaughlin & Flanagan, 2009). Reviewing previous studies, it stands out there are many variables that can have an impact on how students cope with their stress (Khan, Mahmood, Badshah & Jamal, 2006; Shankland, Genolini, França, Guelfi & Ionescu, 2010). For the current study, the influence of stress mindset on coping and anxiety will be investigated as the role of mindset plays in relation to coping and anxiety is unclear. Previous studies attempting to change the stress mindset were related to better health and performance (Crum et al., 2013). Additionally, the study of Horiuchi et al. (2018) investigated if coping would mediate the relation between stress mindset and psychological stress responses. They found support for the assumption that emotional expression partially mediates the relation between a stress-is-enhancing mindset and higher irritability-anger levels. None of the coping styles mediated the relationship between a stress-is-enhancing mindset and psychological stress responses. The goal of the current study was to investigate the influence stress mindset has on coping and anxiety.

The following hypotheses have been formulated:

- I. The negative association between stress mindset and anxiety is mediated by problem-focused-coping
- II. The negative association between a stress mindset and anxiety is mediated by emotion-focused coping
- III. The negative association between a stress mindset and anxiety is mediated by avoidance-coping

Methods

Study design

The study had a cross-sectional design. A questionnaire was used to investigate the cross-section of a population at a specific time point. Examined was the relationship between the dependent variable stress mindset and the independent variables anxiety symptoms and the three mediators problem-focused coping, emotion-focused coping and avoidance-focused coping.

Participants

In total, 104 people were recruited. The inclusion criteria included being at least 18 years old and having a sufficient English level. The sample consisted mostly of people from Germany (76.9%) 24 participants had other nationalities (23.1%). The majority of the participants were female (69.2%), and the mean age was 21.23 ($SD = 3.62$). Most of the participants were undergraduate university students 95 (91.3%), one person was self-employed (1.0%), four people were unemployed, and one person worked part-time (1.0%) and three people full-time (2.9%). Additionally, 99 participants were single (95.2%), and the rest were married. All participants had sufficient English skills to take part in the study, 86 with an advanced English level (82.7%), and the rest an even higher level. Most of the participants had a high school or equivalent degree (82.7%), three of them had an Associate's degree (2.9%), thirteen had a Bachelor's degree (12.5%), and two of them had a Master's degree (1.9%).

Procedure

Ethical approval for the study was granted by the Ethics committee of the behavioural, management and social sciences faculty of the University of Twente. The study was conducted in April 2019. Participants were recruited by convenience sampling from two different sources. First, the platform SONA SYSTEMS from the University of Twente was used. Students receive credit points for completing studies but can voluntarily select the studies they would like to participate in. Second, the four researchers shared the link of the online questionnaire created in Qualtrics with friends and acquaintances. All participants completed the online survey on their own devices being freely able to choose the time point and place. Before the begin of the study, the participants received an informed consent, which included information about the goal and procedure of the study and ensured anonymity and confidentiality. They received thorough explanations regarding their participants' rights, including the right to refuse to participate or withdraw their participation at any time. After being asked to fill out questions about their

demographics, gender, age, education, occupation, as well as English proficiency, participants were asked to answer questions, mostly in multiple-choice style about anxiety level, stress mindset and coping strategies. For the present study included the STAI-S/T (Spielberger & Gorsuch, 1983), the stress mindset scale (Crum, Salovey & Achor, 2013) as well the coping strategies inventory (Tobin, Holroyd & Reynolds, R. 1984). The completion of the study took approximately 20 to 30 minutes.

Materials

State-trait Anxiety scale

For measuring anxiety levels, both of the scales, including in the State-Trait Anxiety Inventory (STAI) was used (Spielberger & Gorsuch, 1983). It is a self-administered questionnaire suitable for individuals and groups and contains two scales. The S-Anxiety scale has twenty statements and assesses how the respondent's feel at a given moment (e.g., "I feel frightened," "I feel upset"). The participants indicated on each item which describes the intensity of their feelings on a continuum (1) not at all; (2) somewhat; (3) moderately so; (4) very much so. The T-anxiety scale also consists of twenty statements but is a more general evaluation of how a person feels. Here participants are instructed to indicate what describes the frequency of their feelings of anxiety in general on a four-point scale: (1) almost never; (2) sometimes; (3) often; (4) almost always. The completion for each questionnaire requires around six to ten minutes, depending on the health and level of education of the examinee. For scoring the S-Anxiety and T-anxiety scales, the weighted scores are added up for the twenty items. The STAI has been used in a variety of samples, proven to be reliable and valid for measuring anxiety. In a student sample ($n = 318$), it had a good internal consistency (Kaupuzs, Vazne, & Usca, 2015). The Cronbach's alpha for both scales was excellent (T-anxiety $\alpha = .94$ and the S-anxiety scale $\alpha = .93$).

Stress-mindset measure

To assess whether participants were holding a stress-is-enhancing or stress-is-debilitating mindset, the stress mindset measure (SMM) developed by Crum, Salovey and Achor (2013) was used. The questionnaire consists of eight items answered by the extent to which a participant agrees or disagrees with a statement: (0) strongly disagree; (1) disagree; (2) neither agree nor disagree; (3) agree; (4) strongly agree. The instrument evaluates the respondent's general stress mindset (e.g. "The effects of stress are negative and should be avoided"). Additionally, symptoms related to enhancing and debilitating consequences of stress in regard to health, learning and growth are investigated (e.g. "Experiencing stress improves health and

vitality”). For scoring, SMM scores are obtained by reverse scoring of the four negative items and then taking the mean of all eight items. High scores represent the mindset that stress is enhancing. In Crum's et al. study (2013), the Cronbach's alpha in the sample indicated good psychometrics of the scale. In the current study, it was good ($\alpha = .81$).

Coping strategies inventory

To assess the dominant coping style of the participants (problem-solving, emotional-coping or avoidance-coping style), three scales of the Coping Strategies Inventory were used (Tobin, Holroyd, & Reynolds, 1984). The initial test is a self-report questionnaire containing 72 items. It aims to assess coping thoughts and behaviours during a specific stressful event (Tobin, Holroyd & Reynolds, 1984). Respondents are requested to first think of a specific event of a stressful episode and then to describe it in a few sentences. In the present study, only three scales and respectively, 27 items had been of relevance and were administered to the participants. First, the problem-solving scale which includes items assessing both behavioural and cognitive strategies designed to eliminate the stressor by actively changing the stressful situation (e.g. “I made a plan of action and followed it”). Second, the social support subscale items referring to seeking emotional support from one’s social network (e.g. “I talked to someone about how I was feeling”). Third, problem avoidance subscale, assessing behaviours and cognitions related to the denial of problems and the avoidance of thoughts or action about the stressor (e.g. “I avoided thinking or doing anything about the situation”). The respondents were asked to indicate for each item the extent to which they performed a particular coping response in a 5-item Likert format: (1) not at all; (2) a little; (3) somewhat; (4) much; (5) very much). In order to obtain the raw score for a subscale, the item scores are added. The Coping strategies Inventory is often used due to its good psychometric properties (Tobin et al., 1984). In the current study the Cronbach's alpha was acceptable for all scales problem-focused coping ($\alpha = .78$), emotion-focused coping ($\alpha = .84$) and avoidance-focused coping ($\alpha = .70$).

Statistical analysis

All analyses were performed using SPSS version 25 for Mac and the PROCESS macro for SPSS statistics. Missing cases were removed from the data set, but as many as possible valid cases were used for the analysis. First, descriptive analysis was done calculating the means, standard deviations and correlations between the study variables. Correlation analysis was performed to examine the association between the variables stress mindset, coping and state-

trait anxiety. In order to test the hypothesis, the bootstrap mediation procedure by Preacher and Hayes was conducted (2008). The independent variable stress mindset, the dependent variable anxiety and three mediators problem-focused coping, emotion-focused coping and avoidance-focused coping were analysed. The nonparametric resampling procedure for testing mediation did not assume normality of the sampling distribution as it did involve repeated sampling from the data set and estimating the indirect effect in each resampled data set. The estimate of the indirect effect was derived from the mean of 5,000 bootstraps samples. A mediation effect was established when the confidence interval of 95% of the indirect effect did not include zero (Preacher & Hayes, 2008).

Results

Preliminary analysis

The correlation analysis revealed the three coping styles were significantly related to anxiety see Table 1 (Problem-focused coping $r = -.32^*$; emotion-focused coping $r = -.21^*$; avoidance-focused coping $r = .24^*$). The associations between stress mindset and the three coping styles and anxiety were not significant.

Table 1

Mean (SD) and Pearson correlation among the studied variables (n=104)

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Problem-focused coping	28.51	28.51	-				
2. Emotion-focused coping	28.06	28.06	.31**	-			
3. Avoidance-focused coping	19.23	19.23	.26**	.06	-		
4. Anxiety	84.98	21.73	-.32**	-.21*	.24*	-	
5. Stress mindset	21.50	5.34	.12	-.12	-.13	-.16	-

Note. *M* and *SD* are used to present mean and standard deviation, respectively.

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Hypothesis testing

The mediation analysis indicated that stress mindset and anxiety were not significantly associated (Direct effect: $\beta = -.55$ $t(104) = -1.42$ $p = .159$). Table 2 reports the associations between the independent variable stress mindset, the mediators problem-focused coping, emotion-focused coping and avoidance-focused coping and the dependent variable anxiety. Only problem-focused coping was significantly associated with anxiety ($\beta = -.71$; $p = .036$). The main effect from emotion-focused coping ($\beta = -.39$, $p = .164$) as well as avoidance-focused coping ($\beta = -.57$, $p = .932$) on anxiety was not significant. Stress mindset was not significantly related to any of the three coping styles problem-focused coping ($\beta = .15$; $p = .232$); emotion-focused coping ($\beta = -.19$; $p = .222$) avoidance-focused coping ($\beta = -.15$; $p = .191$).

Table 2

Mediation analysis for stress mindset (IV), Coping style (emotion-, problem-, avoidance-focused) and anxiety (DV) (n=104)

Stress mindset (IV to mediators)					Anxiety (Mediators to DV)			
β	SE	t	p	Coping	β	SE	t	p
.15	.12	1.20	.23	Problem-focused	-.71	.33	-2.12	.04*
-.19	.15	-1.23	.22	Emotion-focused	-.39	.26	-1.54	.13
-.15	.11	-1.31	.19	Avoidance-focused	-.57	.34	1.69	.09

Note. IV and DV are used to describe the independent variable and dependent variable, respectively.

- I. The negative association between a stress mindset and anxiety is mediated by problem-focused coping

The 95% bias-corrected interval size for the size of the total indirect effect of problem-focused includes zero [-3.6, 1.0] which means problem-focused coping is not a significant mediator in the association between stress mindset and anxiety. Therefore, the first hypothesis was rejected.

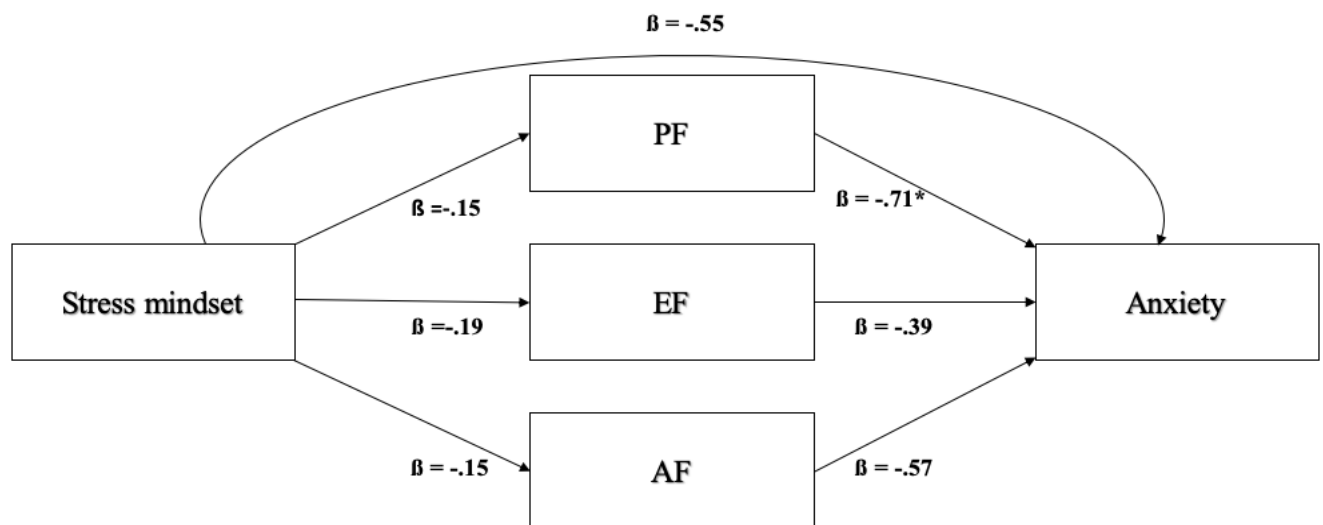
COPING AS THE MEDIATOR BETWEEN STRESS MINDSET AND ANXIETY

- II. The negative association between stress mindset and anxiety is mediated by emotion-focused-coping

The 95% bias-corrected interval size for the size of the total indirect effect of emotion-focused coping includes zero [-0.5; .32] which means emotion-focused coping is not a significant mediator in the association between stress mindset and anxiety. Therefore, the second hypothesis was rejected.

- III. The negative association between a stress mindset and anxiety is mediated by avoidance-coping

The 95% bias-corrected interval size for the size of the total indirect effect of avoidance-focused coping includes zero [-.3.1, .04], which means avoidance-focused coping is not a significant mediator in the association. between stress mindset and anxiety. Therefore, the third hypothesis was rejected.



Note. PF stands for Problem-focused, EF for Emotion-focused, AF for Avoidance-focused.

Figure 1
Direct mediation effect of the study variables

Discussion

The purpose of this study was to assess whether stress mindset and anxiety were related, and different coping styles could explain this association. Three suspected mediators were problem-focused, emotion-focused and avoidance-focused coping. The findings of the study revealed no evidence for coping being a mediator in the relationship between stress mindset and anxiety. It was hypothesised stress mindset and anxiety are negatively associated when participants adopted an active coping style. Active coping styles included emotion-focused coping or problem-focused coping. Previous research found a significant association between active coping and better well-being and performance in contrast to passive coping (Mennin, McLaughlin & Flanagan, 2009; Chao, 2011). Therefore, it was assumed passive coping, thus avoidance-focused coping would be associated with higher levels of anxiety. No associations were found; thus, all three hypotheses were rejected.

The results of the current study contribute to the existing literature which investigated the relationship between stress mindset with coping and psychological stress responses (Crum et al., 2013; Crum et al., 2017; Kilby & Sherman, 2017). Previous research, for instance, the study from Crum and her colleagues (2013) supported the assumption that stress mindset is an important variable in determining the stress response. Using the same stress mindset measurement as the current research used; the study found evidence that stress mindset has a meaningful association with stress-relevant outcomes like health and well-being. The present study investigated the stress mindset as a whole construct and not separately as a stress-is-enhancing or stress-is-debilitating mindset. Therefore, it is still possible that stress mindset and anxiety have an important relationship when being investigated as separate constructs. The study of Horiuchi and colleagues (2018), for instance, found a significant correlation between emotion-focused coping and the stress-is-enhancing mindset but no significant association with the stress-is-debilitating mindset. Besides that, other previous research investigated the association between stress mindset and stress responses (Jamieson et al., 2018). The study found evaluating a stressful event as a challenge or as a threat, was related to specific physiological body responses (Jamieson et al., 2018). Therefore, it was assumed to find evidence for stress mindset to be associated with anxiety, since the concept of anxiety includes physiological body responses, like an elevated heart rate (Stojanovic et al., 2018). The present study did not find any support for this relationship.

The missing association with coping and anxiety might be related to the characteristics of the sample, which mainly included undergraduate students in their young

twenties. The study from Renk and Smith (2007) revealed academic-related stress experienced in college students was not significantly related to either emotion-focused or avoidance-focused coping. However, problem-focused coping was a significant predictor for the level of stress experienced by the college student sample. The results suggested; problem-focused coping served as an effective way of dealing with academic related stressors. The study could not provide a substantial explanation for this result and further research is necessary to understand this relationship. The present study had similar results; only problem-focused coping had a significant association with anxiety in the mediation analysis. The focus was not intended to be academic-related stress, but the assessment of the dominant coping style was based on a self-chosen event. Since most of the participants were students, the probability is likely they chose an academic-related event. Therefore, the results of the present study might hold true for academic-related stress events but not for other stressors. Earlier research investigated the influence coping has on academic-related stress (Crego, Carrillo-Diaz, Armfield & Romero, 2016). They found out that emotion-focused coping was associated with higher stress and anxiety levels. They assumed the results were explained by lower levels of self-efficacy to successfully complete the exams and have poorer academic results. In contrast, rational coping strategies, like problem-focused coping, was associated with a reduced perception of stress and higher levels of academic-related self-efficacy. Therefore, problem-focused coping was more effective than emotion-focused coping when dealing with academic-related stress and reducing anxiety. Overall, the results of the present study match earlier studies investigating the association between coping and academic-related stress.

Another possible explanation of the missing association of coping and anxiety might be not taking coping flexibility into account. According to Kato (2012), coping flexibility refers to the ability to modify and adapt to the coping style when encountering a specific stressful situation. One common way to capture coping flexibility is the fitness approach, which refers to the flexibility to select a coping strategy based on changes in the appraisal of the stressor. In this way, problem-focused coping was found to be useful when the stressful event is controllable, and the individual can actively change the situation in any way. In contrast, emotion-focused coping in a controllable situation was found to be rather ineffective (Kato, 2012). Consequently, leading to the conclusion, the missing associations between stress mindset, coping, and anxiety might be due to the assessment of the coping style conceptualising it as something fixed and generalizable to several stressors.

Strengths and Limitations

A major strength of the current study is the use of the State-Trait anxiety measure (Spielberger & Gorsuch, 1983). It is a validated and reliable anxiety measurement tool. Its frequent use enables to compare to the results of the current study to other studies using this instrument. Another strength of the current study is that all scales have a good Cronbach's alpha, thus good internal consistency of the measurement tools which validate the study results. Furthermore, the study assessed the dominant coping strategy via the coping strategies inventory, which is proven to be a reliable and valid measurement tool (Tobin, Holroyd & Reynolds, 1984).

Participants were asked to think of a specific event when they experienced stress before and during filling out the questionnaire. Even though individuals have a dominant coping approach across life situations, different events might lead to a different use of coping strategies than usual (Lazarus & Folkman, 1984). Semmer and Meier (2009) emphasised, there may be differences on a 'meta-level' meaning individuals differ in their flexible use of their strategies. Therefore, the results must be interpreted in light of the assessment of the coping style, which was linked to one specific self-chosen event of the participant. The general dominant coping style of the individual might differ from the one assessed in the present study. The study focused on three types of coping. However, there are various conceptualisations of coping and various coping scales which should be used to replicate and extend the current findings in the future. Besides the three selected coping styles under investigation, there exists many more, for example, cognitive reinterpretation or emotion expression, and the participants might not identify with one of those three assessed in the present study (Horiuchi et al., 2018).

In previous studies, stress mindset was categorised in either a stress-is-enhancing mindset and stress-is-debilitating mindset (Horiuchi et al., 2018). The present study investigated the stress mindset as a whole rather than differentiating between the two. This presents a limitation to the study because of the possibility that the form of coping is significantly associated with specifically a stress-is-enhancing mindset but not a stress-is-debilitating mindset (Crum et al., 2013). In the present study, however, they were both measured as one and the same variable. Another possible limitation of the current study is its cross-sectional design. The design only captures a short period of time, which makes it impossible to infer causality in the relationship between stress mindset, coping and anxiety. Moreover, it is more prone to bias than other study designs. This is an essential limitation because the mediating effects found in cross-sectional studies are not always replicated in longitudinal research (Maxwell, Cole & Mitchell, 2011). Additionally, the sample was homogenous, including mostly German people in their early 20s. Therefore, the results need to

be interpreted in light of the characteristics of the study sample, and it is in question whether the results would differ for different age groups. The homogeneity of the sample makes the results of the study less generalizable. Therefore, the current findings should be replicated with larger, more diverse samples.

Implications for Future Research

Considering the outcomes of the study differ from previous research, and in the light of the limitations of the present study, further research in this field is needed to gain a deeper understanding of the role stress mindset plays in reacting to stress and how coping is influencing this relationship. In the current study, no evidence for coping as a mediator in the association between stress mindset and anxiety has been found. In the mediation analysis problem-focused coping has been related to anxiety. Based on this finding, future research investigating different stress mindsets and its relation to coping and anxiety should be conducted. One limitation of the present study included researching stress mindset as a whole construct and not emphasising the influence of a specific mindset. In a study by Horiuchi and colleagues (2018), for example, differentiation between two stress mindsets has been made. A stress-is-enhancing which evaluates stress a challenge and a stress-is-debilitating mindset which evaluates stress as a threat. Emotional expression was found to partially mediate the relationship between a stress-is-debilitating mindset and the stress response, but not in relation to a stress-is-enhancing mindset. Therefore, a study investigating stress mindset as two separate constructs and its association with coping and anxiety would be valuable.

Another path for future research would be investigating anxiety mindset rather than stress mindset in relation to coping and anxiety. Past research on the relationship between mindset, coping and anxiety focused on growth and fixed mindset which are categorized as anxiety mindset (Schroder, Yalch, Dawood, Callahan, Donnellan & Moser, 2017). The underlying belief with a growth mindset is that attributes like intelligence or personality can be changed, whereas someone with a fixed mindset would believe they are fixed. The study of Schroder et al. (2017) emphasised the general finding that a growth mindset buffers the negative consequence of challenging experiences. Therefore, the hypothesis if coping mediates the relationship between anxiety mindsets and anxiety would be interesting to test. Consequently, further insight gained into the relationship between mindset and coping can contribute to the base of knowledge to create mindset interventions to reduce anxiety.

Conclusion

COPING AS THE MEDIATOR BETWEEN STRESS MINDSET AND ANXIETY

As stress and anxiety are a collective experience for most of the population, especially students, the present study investigated the relationship between stress mindset and anxiety. Contrasting to what has been expected, the current study did not yield evidence for coping being a mediator of the association between stress mindset and anxiety. It remains unclear why stress mindset was not associated with anxiety. Nevertheless, the findings added knowledge to the not yet well researched field of stress mindset.

References

- Alharbi, H., & Alshehry, A. (2019). Perceived stress and coping strategies among ICU nurses in governmental tertiary hospitals in Saudi Arabia: a cross-sectional study. *Annals of Saudi medicine*, 39(1), 48-55. doi: 10.5144/0256-4947.2019.48
- Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social psychiatry and psychiatric epidemiology*, 43(8), 667-672. doi:10.1007/s0012008-0345-x
- Carver, C. S., & Scheier, M. F. (1994). Situational coping and coping dispositions in a stressful transaction. *Journal of personality and social psychology*, 66(1), 184. doi: 10.1037//0022-3514.66.1.184
- Chao, R. C. L. (2011). Managing stress and maintaining well-being: Social support, problem-focused coping, and avoidant coping. *Journal of Counseling & Development*, 89(3), 338-348. doi: 10.1002/j.1556-6678.2011.tb00098.x
- Crego, A., Carrillo-Diaz, M., Armfield, J. M., & Romero, M. (2016). Stress and academic performance in dental students: the role of coping strategies and examination-related self-efficacy. *Journal of dental education*, 80(2), 165-172.
- Crum, A. J., Akinola, M., Martin, A., & Fath, S. (2017). The role of stress mindset in shaping cognitive, emotional, and physiological responses to challenging and threatening stress. *Anxiety, Stress, & Coping*, 30(4), 379-395. doi:10.1080/10615806.2016.1275585
- Crum, A. J., & Langer, E. J. (2007). Mind-Set matters: Exercise and the placebo effect. *Psychological Science*, 18, 165–171. doi:10.1111/j.14679280.2007.01867.x
- Crum, A. J., Salovey, P., & Achor, S. (2013). Rethinking stress: The role of mindsets in determining the stress response. *Journal of personality and social psychology* 104(4), 716-733. doi: 10.1037/a0031201
- Dijkstra, M., & Homan, A. C. (2016). Engaging in rather than disengaging from stress: Effective coping and perceived control. *Frontiers in psychology*, 7, 1415. doi:10.3389/fpsyg.2016.01415.
- Horiuchi, S., Tsuda, A., Aoki, S., Yoneda, K., & Sawaguchi, Y. (2018). Coping as a mediator of the relationship between stress mindset and psychological stress response: a pilot study. *Psychology research and behavior management*, 11, 47. doi:10.2147/PRBM.S150400
- Jamieson, J. P. (2017). Challenge and threat appraisals. *Handbook of competence and motivation: Theory and application*, 175-191.
- Jamieson, J. P., Crum, A. J., Goyer, J. P., Marotta, M. E., & Akinola, M. (2018). Optimizing stress responses with reappraisal and mindset interventions: An integrated model. *Anxiety, Stress, & Coping*, 31(3), 245-261. doi: 10.1080/10615806.2018.1442615
- Khan, M. S., Mahmood, S., Badshah, A., Ali, S. U., & Jamal, Y. (2006). Prevalence of depression, anxiety and their associated factors among medical students in Karachi, Pakistan. *Journal-Pakistan Medical Association*, 56(12), 583.
- Kato, T. (2012). Development of the Coping Flexibility Scale: Evidence for the coping flexibility hypothesis. *Journal of counseling psychology*, 59(2), 262. doi: 10.1037/a0027770

- Kaupuzs, A., Vazne, Z., & Usca, S. (2015). Evaluation of psychometric properties of the state and trait anxiety inventory scale in a student sample. *SOCIETY, INTEGRATION, EDUCATION. Proceedings Of The International Scientific Conference, 1*, 198. doi: 10.17770/sie2015vol1.317
- Kilby, C. J., & Sherman, K. A. (2016). Delineating the relationship between stress mindset and primary appraisals: preliminary findings. *SpringerPlus*, 5(1), 336. doi: 10.1186/s40064-016-1937-7
- Kohn, P. M., Hay, B. D., & Legere, J. J. (1994). Hassles, coping styles, and negative well being. *Personality and Individual Differences*, 17(2), 169-179. doi: 10.1016/0191-8869(94)90023-X
- Lazarus, R.S. and Folkman, S. (1984). *Stress, appraisal, and coping*. New york: Springer publishing company.
- Maxwell, S. E., Cole, D. A., & Mitchell, M. A. (2011). Bias in cross-sectional analyses of longitudinal mediation: Partial and complete mediation under an autoregressive model. *Multivariate Behavioral Research*, 46(5), 816-841. doi: 10.1080/00273171.2011.606716
- Mantzicopoulos, P. (1990). Coping with school failure: Characteristics of students employing successful and unsuccessful coping strategies. *Psychology in the Schools*, 27(2), 138-143. doi: 10.1002/15206807(199004)27:2<138::AIDPITS2310270208>3.0.CO;2-8
- Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American journal of Health studies*, 16(1), 41-51.
- Mennin, D. S., McLaughlin, K. A., & Flanagan, T. J. (2009). Emotion regulation deficits in generalized anxiety disorder, social anxiety disorder, and their co-occurrence. *Journal of anxiety disorders*, 23(7), 866-871. doi: 10.1016/j.janxdis.2009.04.006
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods*, 40(3), 879-891. doi: 10.3758/BRM.40.3.879
- Renk, K., & Smith, T. (2007). Predictors of academic-related stress in college students: An examination of coping, social support, parenting, and anxiety. *Naspa Journal*, 44(3), 405-431. doi: 10.2202/1949-6605.1829
- Schroder, H. S., Dawood, S., Yalch, M. M., Donnellan, M. B., & Moser, J. S. (2015). The Role of Implicit Theories in Mental Health Symptoms, Emotion Regulation, and Hypothetical Treatment Choices in College Students. *Cognitive Therapy and Research*, 39(2), 120–139. doi: 10.1007/s10608-014-9652-6
- Schroder, H. S., Yalch, M. M., Dawood, S., Callahan, C. P., Donnellan, M. B., & Moser, J. S. (2017). Growth mindset of anxiety buffers the link between stressful life events and psychological distress and coping strategies. *Personality and Individual Differences*, 110, 23-26. doi: 10.1016/j.paid.2017.01.016
- Semmer, N. K., & Meier, L. L. (2009). Individual differences, work stress and health. *International handbook of work and health psychology*, 3, 99-122.
- Shankland, R., Genolini, C., França, L. R., Guelfi, J. D., & Ionescu, S. (2010). Student adjustment to higher education: the role of alternative educational pathways in coping

- with the demands of student life. *Higher Education*, 59(3), 353-366. doi: 10.1007/s10734-009-9252-7
- Spielberger, C. D., & Gorsuch, R. L. (1983). *State-trait anxiety inventory for adults: sampler set: manual, test, scoring key*. Mind Garden.
- Stojanovic, G., Vasiljevic-Blagojevic, M., Stankovic, B., Terzic, N., Terzic-Markovic, D., & Stojanovic, D. (2018). Test Anxiety in Pre-Exam Period and Success of Nursing Students. *Serbian Journal of Experimental and Clinical Research*, 19(2), 167-174. doi: 10.1515/sjecr-2017-0060
- Tobin, D. L., Holroyd, K. A., & Reynolds, R. V. C. (1984). User's manual for the Coping Strategies Inventory. *Athens, OH: Ohio University*.
- Vanstone, D. M., & Hicks, R. E. (2019). Transitioning to university: Coping styles as between adaptive-maladaptive perfectionism and test anxiety. *Personality and Individual Differences*, 141, 68-75. doi: 10.1016/j.paid.2018.12.026