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Coping strategies as mediators within the relationship between emotion-regulation and perceived stress in teachers

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The aim of the present study was to examine whether different coping strategies (focus on positive, support coping, active coping and evasive coping) mediate the relationship between emotion-regulation (i.e., emotion acceptance skills, emotion resilience skills and emotion regulation skills) and perceived stress in physical education (PE) teachers. The sample consisted of 457 PE pre-service teachers. Results show that evasive coping strategies partly negatively mediate the relationship between emotion resilience skills and emotion regulation and perceived stress. Therefore, emotion-regulation might protect against using evasive coping strategies, which have been found to be related to higher stress in previous studies.

Keywords: emotion regulation, resources, coping, physical education, teacher stress

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Introduction

Perceived stress in physical education (PE) teachers results from a wide range of different demands, such as limited equipment and facilities or a high level of noise (von Haaren-Mack et al., 2019). Chronic perceived stress is, in particular, related to negative health consequences (Johnson, 2005). To avoid these consequences, it is important that teachers have resources and adequate coping strategies that protect them from chronic perceived stress. Previous research has shown that emotion-regulation is an important resource for teachers because of the regular teacher-student interactions, which can produce unpleasant emotions, such as in situations of pupils' misbehavior (Chang, 2009; Chang, 2013). However, the investigation of coping strategies

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within the relationship between emotion-regulation and perceived stress in teachers has been neglected. Therefore, the purpose of the present study was to examine whether coping strategies can mediate the relationship between PE teachers' emotion-regulation and perceived stress.

Emotion-regulation can be defined as "the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (Thompson, 2008, pp. 27–28). Based on this, emotion-regulation ability can be understood as the ability to deal effectively with negative emotions with the help of emotion-regulation skills (Berking et al., 2008). Emotion-regulation ability comprises a set of different skills. Berking et al. (2008) argue that specific emotion regulation skills, i.e., being able to actively modify emotions in order to feel better, emotion acceptance skills, i.e., being able to accept emotions and emotion resilience skills, i.e., being resilient to negative emotions, should be considered as central components of emotion-regulation ability.

Emotion-regulation ability and its relationship with teachers' health outcomes has received increased research attention over the last few years. The results indicate that emotion-regulation ability and burnout as an outcome are linked (Brackett et al., 2010; Castillo-Gualda et al., 2019; Fiorilli, et al., 2017). In a study by Rey and colleagues (2016), perceived stress was found to significantly mediate the relationship between emotional competence and burnout. Teachers with high emotional competence experience less perceived stress and less burnout. In general, burnout can be seen as a long-term consequence of perceived stress and perceived stress is influenced by resources and coping strategies (Lazarus & Folkman, 1984; Rey et al., 2016). Therefore, the relationship between emotion-regulation ability as a resource, coping strategies and perceived stress should be examined to gain insights into the underlying mechanism.

The development of perceived stress can be explained with the help of the transactional model of stress and coping (Lazarus & Folkman, 1984). In this model, a twofold appraisal process is crucial for the development of perceived stress. Within primary appraisal, a person rates the relevance of a situation for his or her well-being. The situation can be rated as being positive, irrelevant or stressful. A stressful appraisal is accompanied by a negative emotional reaction, such as feelings of harm, threat or challenge. During secondary appraisal, a person evaluates the efficacy of his or her available options to cope with the situation. Coping is defined as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984, p. 141).

Different terminologies and categorizations of coping strategies exist in the literature (Carver & Connor-Smith, 2010; Schwarzer & Schwarzer, 1996; Skinner et al., 2003). One categorization, which is based on Knoll, Rieckmann and Schwarzer (2005), differentiates four categories of coping strategies, namely *focus on positives* (i.e., acceptance, positive reframing and humor), *support* coping (i.e., instrumental support, emotional support and religion), *active* coping (i.e., active coping and planning) and *evasive* coping (i.e., self-blame, denial and venting of emotions). In contrast to categorizations that differentiate between adaptive and

maladaptive or between functional and dysfunctional strategies, the categorization of Knoll and colleagues does not judge the quality of the coping strategies.

Coping strategies differ in their relationship with perceived stress (Lazarus & Folkman, 1984). For example, reframing is negatively associated with perceived stress (Freire et al., 2016), whereas denial is positively associated with stress (Nielsen & Knardahl, 2014). Given these different relationships between coping strategies and perceived stress, it is important to identify which factors influence the choice of coping strategies. This choice depends on a person's resources, such as social skills, positive beliefs, or money (Lazarus & Folkman, 1984). Thus, taken together, a person's resources determine her or his choice of coping strategy, which is in turn related to perceived stress. In other words, coping mediates the relationship between resources and perceived stress. For example, if a person perceives a high emotion-regulation ability, she or he might prefer using positive reframing and might, in turn, experience less stress than in the case of using denial as a coping strategy.

The relationship between emotion-regulation ability and different outcomes mediated by coping strategies has already been investigated in previous research. Previous research has mostly examined outcomes that are not directly linked to perceived stress, such as verbal behaviors in youth soccer (Teques et al., 2018), academic achievement (MacCann et al., 2011) or job satisfaction (Sun et al., 2017). In terms of the relationship between emotion-regulation abilities and stress-related constructs, studies on coping strategies as a mediator are very limited. Nizielski and colleagues (2013) investigated the relationship between emotional appraisal and burnout in teachers. The results show that emotion appraisal as a component of emotional intelligence facilitates the use of proactive coping strategies, such as problem-solving, which, in turn, are negatively related to burnout. Chan (2006) found that gifted students who have high self-relevant emotional abilities (self-management and utilization) used less avoidant coping strategies, which are positively associated with psychological distress. Furthermore, gifted students who were scored high on other emotional abilities (empathy and social skills) used more social-interaction coping strategies, which are negatively related to psychological distress.

Besides the emotional-regulation abilities that have been considered in these two studies, emotion regulation skills, emotion acceptance skills and emotion resilience skills have been identified as important subcomponents of overall emotion-regulation ability (Berking & Znoj, 2008). Emotion regulation skills (i.e., being able to actively modify emotions in order to feel better), emotion acceptance skills (i.e., being able to accept emotions) and emotion resilience skills (i.e., being resilient to negative emotions) are helpful to change, tolerate and to withstand negative emotions. These skills are particularly important in preventing perceived stress and sustaining psychological health (Berking et al., 2008). As these emotional skills have been not considered in previous studies, the research question of the present study was to test the mediation relationship between the emotional skills, i.e., regulation, acceptance and resilience, choice of coping strategies and perceived stress.

To sum up, the relationship between emotion-regulation ability and perceived stress or stress-related constructs has been examined in a few studies. However, there is a lack of studies that involve coping strategies as crucial components within the process of perceived stress. Furthermore, teachers in general have been considered in previous studies, but PE teachers as a subgroup have been neglected. Therefore, the aim of the present study was to shed light on the interaction between emotion regulation abilities as a resource, coping and perceived stress amongst PE teachers.

Method

Sample

The sample comprised 477 German PE pre-service teachers. As a result of a multivariate outlier analysis, the final sample was reduced to 475 participants (55.7% M, 44.2% F; age: *M* = 38.98, *SD* = 11.35, Min = 25, Max = 65). The 475 participants had 10.00 (*SD* = 9.84, Min = 0, Max = 40) years of teaching experience on average and taught 9.16 (*SD* = 5.18) PE lessons per week on average.

Measures

Emotion-regulation ability. Emotion-regulation ability was assessed by the 'emotion resilience skills', 'emotion acceptance skills' and 'emotion regulation skills' subscales of the Emotion Regulation Questionnaire-27 (Berking & Znoj, 2008). For each subscale, three items were rated on a five-point Likert scale ranging from 0 ("not at all") to 4 ("always"), asking the participants to indicate their skills in handling problematic emotions in general. In addition to the results of previous studies (e.g., Berking & Znoj, 2008) that indicate good psychometric properties of this instrument, our data show acceptable internal consistencies (resilience: $\alpha = .78$; acceptance: $\alpha = .65$; regulation: $\alpha = .79$).

Coping strategies. Coping strategies were assessed with the German version of the Brief COPE questionnaire (Knoll et al., 2005). This questionnaire contains 22 items and measures four kinds of coping strategies: focus on positives (acceptance, positive reframing, humor), support coping (instrumental support, emotional support), active coping (active coping, planning) and evasive coping (self-blame, denial, venting). The items were rated on a four-point Likert-scale ranging from 1 ("not at all") to 4 ("very much"), asking the participants about their coping in demanding or difficult situations related to PE lessons. In addition to the results of previous studies (e.g., Knoll et al., 2005) that indicate good psychometric properties of this instrument, our data show acceptable internal consistencies (focus on positives: $\alpha = .69$; support coping: $\alpha = .75$; active coping: $\alpha = .70$; evasive coping: $\alpha = .65$).

Perceived stress. Perceived stress was measured by the Perceived Stress Questionnaire (Fliege et al., 2005). The questionnaire comprises 20 items that provide an overall score of perceived stress. The rating scale ranges from 1 ("almost") to 4 ("usually"). The instructions asked participants to rate how often an item applied in their life as a PE pre-service teacher in the previous four weeks. In addition to the results of previous studies

(e.g., Fliege et al., 2005) that indicate good psychometric properties of this instrument, our data show an acceptable internal consistency ($\alpha = .71$).

Procedure

After gaining permission from the ethics commission of the local university, PE pre-service teachers were recruited by a convenience sampling approach. A request was sent to schools asking for the participation of their PE and pre-service PE teachers. In case of a positive answer, questionnaires were sent with pre-paid envelopes to these schools and the participants sent the questionnaires back via mail. Furthermore, PE pre-service teachers were addressed during lectures for PE pre-service teachers.

Data analysis

Data were screened prior to the main analyses. Firstly, this screening involved analysing the questionnaire items for missing data. Most of the items had less than 5% missing data and none of the items had more than 6.5% missing data. All missing item data were missing completely at random or missing at random in a way that led to similar results when applying a variety of treatments for missing data (Tabachnick & Fidell, 2013). For this reason, for each participant, the variables were calculated as a mean score of the participant's available item data. Variables were not calculated for those participants who had missing data on all items of a variable. Secondly, the screening involved a multivariate outlier analysis. Following the analysis procedure based on the Mahalanobis distance as described by Tabachnick and Fidell (2013), two participants were identified as being multivariate outliers and these were excluded from further data analysis.

Data were then checked for normality (Kolmogorov-Smirnov-tests indicated non-normality; however, given the large simple size underlying these tests, visual inspection was considered and indicated an approximation to normality for all variables), linearity (visual inspection indicated a violation of linearity for some of our variables) and homoscedasticity (visual inspection indicated heteroscedsticity for the majority of our variables). Given these observations, a bootstrapping analysis was chosen as a robust procedure for the main analyses.

Mediation analyses were run with the PROCESS macro (Hayes et al., 2017; Hayes & Rockwood, 2017) for IBM SPSS 26 to investigate the mediating effect of coping strategies (mediator variables; MV) in the relationship between emotional skills (independent variables; IV) and perceived stress (dependent variable; DV). Age, sex and length of service were included as control variables (CV), statistically treated as IVs which are not potentially mediated by coping. Using a bootstrapping approach with 5,000 samples and a confidence interval of 95%, direct, indirect and total effects of the IVs were estimated with ordinary least squares regression. Total effects are the effects of all IVs on the DV. Thus, they comprise the sum of direct (i.e., the effects of IVs on the DV while simultaneously controlling for the effects of MVs) and indirect (i.e., the effects of IVs on DV via MVs) effects. This bootstrapping procedure is more reliable than the classical step method (Baron & Kenny, 1986) or the Sobel test (Sobel, 1986).

Results

Basic descriptive statistics are displayed in Table I. The descriptive statistics show a moderate level of emotional skills, coping strategies and perceived stress and moderate standard deviations when taking into account the respective response scales.

Table I. Descriptive statistics of emotional skills, coping strategies, and perceived stress.

	N	*M*	*SD*	*Min*	*Max*
Emotional skills					
Resilience	465	2.91	0.63	1	4
Regulation	465	2.60	0.68	0.67	4
Acceptance	465	2.85	0.61	1.50	4
Coping strategies					
Focus on positives	458	2.38	0.56	1	3.83
Support coping	465	2.26	0.58	1	4
Active coping	466	2.75	0.62	1	4
Evasive coping	466	1.83	0.47	1	3.75
Perceived stress	471	2.04	0.44	1.05	3.45

The results of the bootstrapped mediation analysis are displayed in Table II. The total effects explain $R^2 = .20$ of the variance in perceived stress ($F(6, 428) = 17.80$, $p < .001$). More specifically, the total effects indicate a significant negative relationship between emotion regulation skill and perceived stress. However, there was no significant relationship between emotion resilience skill and emotion acceptance skill on the one hand, and perceived stress on the other hand. Moreover, there was no significant relationship between control variables (sex, age, length of service) and perceived stress.

The total effect of the relationship between emotion regulation skill and perceived stress consists of a significant negative direct effect and a significant negative indirect effect. The indirect effect occurred due to a significant mediation by evasive coping strategies: Higher emotion regulation skill was associated with less use of evasive coping strategies, which was, in turn, associated with higher perceived stress. There was no significant mediation by the other coping strategies. The indirect effect via evasive coping strategies had a small effect size that was much lower than the direct effect of emotion regulation skill. This means that the total effect of emotion regulation skill on perceived stress was predominantly explained by its direct effect.

Table II. Estimated coefficients for mediation model of emotional skills (IV), coping strategies (MV), and perceived stress (DV) while controlling for demographic variables (CV).

Bootstrapping analysis for mediation model											
	Total effects			**Direct effects**			**Indirect effects**				
	b	*SE*	95% *CI*	*b*	*SE*	95% *CI*		*b*	*SE*	95% *CI*	Effect size[a]
IV							**MV**				
Emotion resilience	-0.050	0.044	[-0.136, 0.037]	-0.012	0.042	[-0.094, 0.071]	overall	-0.038	0.017	[-0.073, -0.004]	-0.054
							Focus on positives	< 0.001	0.003	[-0.004, 0.008]	0.001
							Support coping	< 0.001	0.003	[-0.006, 0.006]	< 0.001
							Active coping	-0.001	0.003	[-0.009, 0.006]	-0.001
							Evasive coping	-0.037	0.018	[-0.074, -0.005]	-0.053
Emotion regulation	-0.238	0.037	[-0.310, -0.166]	-0.201	0.036	[-0.272, -0.129]	overall	-0.038	0.017	[-0.074, -0.006]	-0.058
							Focus on positives	0.004	0.007	[-0.009, 0.018]	0.006
							Support coping	< 0.001	0.003	[-0.006, 0.007]	0.001
							Active coping	0.001	0.003	[-0.004, 0.009]	0.002
							Evasive coping	-0.043	0.015	[-0.076, -0.017]	-0.066
Emotion acceptance	-0.029	0.039	[-0.106, 0.048]	-0.050	0.037	[-0.124, 0.023]	overall	0.021	0.015	[-0.005, 0.052]	0.030
							Focus on positives	< 0.001	0.002	[-0.006, 0.004]	< 0.001
							Support coping	-0.001	0.004	[-0.009, 0.008]	-0.001
							Active coping	-0.002	0.004	[-0.012, 0.003]	-0.003
							Evasive coping	0.024	0.015	[-0.002, 0.055]	0.034
MV											
Focus on positives				0.021	0.038	[-0.053, 0.095]					
Support coping				-0.008	0.044	[-0.093, 0.078]					
Active coping				-0.035	0.036	[-0.106, 0.037]					
Evasive coping				0.308	0.049	[0.212, 0.404]					
CV											
Sex[b]	0.066	0.039	[-0.010, 0.142]								
Age	0.006	0.005	[-0.003, 0.015]								
Length of service	-0.008	0.005	[-0.018, 0.002]								

Despite a non-significant total effect relationship between emotion resilience skill and perceived stress, there was a significant negative indirect effect between these two variables. Again, this indirect effect occurred due to a significant mediation of evasive coping strategies. Higher emotion resilience skill was associated with less use of evasive coping strategies, which, in turn, was associated with higher perceived stress. Also, this indirect effect had a small effect size. There was no significant mediation by the other coping strategies.

Discussion

The purpose of the present study was to examine the influence of emotion-regulation ability on coping and, in turn, perceived stress. The results show that, in part, evasive coping strategies negatively mediate the relationship between emotion-regulation abilities and perceived stress. However, focus on positives, support coping strategies and active coping strategies do not act as mediators.

Persons perceiving low emotion regulation skills and high emotion resilience skills tend to use evasive coping strategies, which are, in turn, related to higher perceived stress. This specific result is in line with results of previous research (Chan, 2006). Also, such mediation is, in general, consistent with the assumptions of the transactional model of stress (Lazarus & Folkman, 1984). This finding can be further explained by the nature of evasive coping, which include behaviors such as avoidance or venting of emotions. It can be assumed that a person who feels able to regulate and withstand potentially negative emotions would not tend to use evasive coping strategies because the person does not see a need to evade a stressful situation. The person feels able to confront herself or himself this stressful situation. This finding is particularly important because evasive coping is positively associated with perceived stress.

In contradiction to previous studies (Chan, 2006; Nizielski et al., 2013), the results of the present study do not show a mediating effect of active coping strategies, support coping strategies and focus on positives coping strategies. Chan (2006) found that persons high on emotional abilities use more social-interaction coping, which is negatively related to psychological distress. Nizielski et al. (2013) showed that facets of emotion-regulation ability facilitate the use of proactive coping strategies, which comprise an active problem-solving and a positive orientation towards the problem. The different mediating effects between evasive coping strategies on the one hand, and active coping strategies, support coping strategies and focus on positives coping strategies on the other hand, could have occurred for three reasons.

Firstly, emotion-regulation ability seems to function as a resource that does not promote adaptive coping strategies, namely using focus on positives coping strategies, support coping strategies and active coping strategies, but buffers against the use of using maladaptive coping strategies (evasive coping strategies). Secondly, assuming this buffering effect, persons high in emotion-regulation ability might be able to flexibly use an adaptive coping strategy that fits their personal preference. This might explain why there was neither a positive nor a negative relationship between emotion-regulation ability and adaptive coping strategies.

Personal coping preferences can be considered in future research by examining coping profiles within the relationship between emotion-regulation ability and perceived stress. Thirdly, it can be assumed that, besides emotion-regulation ability, other resources are relevant for the choice of coping strategies (Boehmer et al., 2007; van den Brande et al., 2016). Research in the past describes resources such as control beliefs as important factors, particularly because they seem to interact with cognitive appraisals and effects coping (Terry, 1991).

In addition to these different mediator effects, our results show a direct effect of regulation skills on perceived stress. From a theoretical point of view, a direct effect is implausible. Instead, it can be assumed that there might be further coping strategies that were not measured through the Brief COPE questionnaire that mediate the relationship between the resources of regulation skills or rather emotional skills in general and perceived stress. These coping strategies could offer an explanation for the statistically direct effect; they would probably not contain solely cognitive coping strategies, as measured in the present study, but may contain, for example, physical activity (Abrantes et al., 2017) or listening to music (Labbé et al., 2007).

Limitations & future research

A few limitations of the present study must be stated. Firstly, because of the cross-sectional design of the study, the results do not allow the interpretation of causal relationships. Secondly, the sample consists of PE pre-service teachers that participated voluntarily. A teacher who experienced high perceived stress might not have participated which could have warped the results. Thirdly, within the present study, various cognitive coping strategies were considered. Previous studies have identified non-cognitive actions such as physical activity (Abrantes et al., 2017) or listening to music (Labbé et al., 2007) as effective coping strategies. Therefore, the results cannot be transferred to coping strategies in general. Fourthly, it can be assumed that beside other coping strategies, other abilities or competencies also have an impact on the coping process of teachers. For example, resources such as self-efficacy might have an impact on the perception of emotional skills. Therefore, future research should further examine the relationship between abilities/competencies (e.g., social competence, Zimmer-Gembeck et al., 2011), coping and perceived stress. Additionally, further resources such as self-efficacy and social network, could be included to explain the choice of coping strategies in more detail. Moreover, future studies should follow a longitudinal or experimental design to shed a light on causal relationships between resources, coping and perceived stress.

Practical implications

Emotion-regulation ability can help prospective PE teachers (pre-service teachers and PE students) to use adequate coping strategies to deal with perceived stress and to prevent negative health consequences. Therefore, there is a need for PE teachers to enhance their emotion-regulation skills, preferably already within their university education. To enhance emotion-regulation skills, intervention programs such as the Affect Regulation Training (Berking & Whitley, 2014) or the cognitive control training (Siegle et al., 2007) have been developed and tested in previous research (Buruck et al., 2016; Siegle et al., 2007). Moreover, it is

recommended that prospective PE teachers have a repertoire of coping strategies that can be flexibly applied to cope with stress, particularly with the variety of stress that can occur during PE lessons.

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