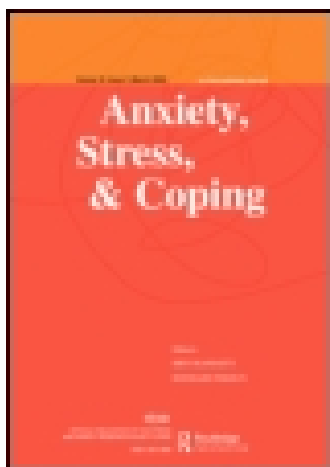




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Exams? Why worry? Interpreting anxiety as facilitative and stress appraisals

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BRIEF REPORT

Exams? Why worry? Interpreting anxiety as facilitative and stress appraisals

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Background and Objectives: The present study examined why people differ in how they appraise the same stressful situation (an approaching exam). **Design:** We explored whether interpreting anxiety as a facilitative emotion can affect the type of stress appraisal people make. **Method:** One hundred and three undergraduate students took part in this study, which lasted for 10 days (leading up to an exam). The students completed a daily self-reported evaluation of anxiety, emotional exhaustion, and stress experienced. **Results:** The findings suggest a process by which a stressful time can be experienced as motivating rather than threatening or emotionally exhausting. For example, interpreting anxiety as facilitative moderated the relationship between anxiety and stress appraisals. When interpreting their anxiety as facilitative, individuals showed a higher tendency to make challenge stress appraisals and a lower tendency to appraising the stressor as a threat. These differences were especially visible with high levels of anxiety. Furthermore, interpreting anxiety as facilitative was negatively associated with emotional exhaustion, but positively associated with the academic performance. **Conclusions:** These findings suggest an explanation why people differ in how they appraise the same stressor: how people interpret their anxiety may to a large part affect how they appraise difficult events and situations.

Keywords: anxiety; stress appraisals; emotional exhaustion

Why do some people appraise a stressor as a threat, while other people appraise the same stressor as a challenge? We propose that the difference lies in how people interpret their anxiety. Although anxiety is commonly evaluated as something negative, we propose that some people interpret anxiety as facilitative, as a source of motivation. We hypothesize that interpreting anxiety as facilitative will be associated with “thriving on stress,” operationalized here as appraising stressors as challenges and not as threats, and moderating the relationship between experienced anxiety and these stressor appraisals. Furthermore, interpreting anxiety as facilitative is expected to be negatively associated with the levels of emotional exhaustion, and positively associated with performance (in the form of academic grades). In order to study this process, we employ a diary study design involving undergraduate students in the week leading up to an exam.

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Sports psychology is perhaps the psychology branch most advanced in the notion that anxiety can be perceived as facilitative (e.g., Jones & Uphill, 2004). Sports psychologists measure competitive anxiety in terms of facilitative versus debilitating anxiety (Jones, 1995). Indeed, anxiety can be a powerful and energizing emotion that can push people to outperform themselves (e.g., Perkins & Corr, 2005). According to the mood-as-input model (Clore, Schwarz, & Conway, 1994), negative emotions such as anxiety can stimulate increased effort and persistence and higher standards of performance (Cervone, Kopp, Schaumann, & Scott, 1994; De Dreu, Baas, & Nijstad, 2008). Negative emotions indicate that there are problems or that things are in need of improvement, signaling that more effort is required (in contrast to positive emotions, which tend to signal that everything is going well). In some situations individuals are aware of the positive effects negative emotions can have, and this can be seen in the different motives people have for regulating their emotions: the framework of instrumental emotion regulation, for example, proposes that under some conditions, namely when negative emotions offer superior instrumental benefits, they are preferred over positive emotions (Tamir, 2005).

We propose that how people interpret their emotions may affect how they appraise stressors: usually, stressor appraisals are thought to influence subsequent emotional reactions (Lazarus, 1991). Although the majority of researchers argue that appraisals occur first, and emotions are a response to these appraisals, this assumption is questioned by findings that appraisals and emotions have a recursive relation, and that the sequence between appraisals and emotional reactions is not always clear-cut (Frijda & Zeelenberg, 2001; Kuppens, Van Mechelen, Smits, & De Boeck, 2003; Lerner & Tiedens, 2006). In terms of stress appraisals, Lazarus (1991) distinguished primary appraisal (motivational relevance and congruence; the perceived nature and influence of an event) and secondary appraisal (perceived resources to cope with the event; ability to cope). We argue that perceiving anxiety as facilitative influences stress appraisals via the individual's perceived ability to cope with the negative emotions that the event might trigger. Therefore, we propose that how individuals interpret their anxiety also affects how they appraise a stressor. Specifically, individuals who interpret their anxiety as facilitative will be more likely to make challenge appraisals, while those who do not experience their anxiety as facilitative will be more likely to make threat appraisals. Challenge appraisals refer to evaluating a situation as an opportunity for self-growth. By contrast, when a person evaluates the situation as a source of failure only, and does not find appropriate coping strategies to manage the demands, the stressor is perceived in terms of a threat (Drach-Zahavy & Erez, 2002). These types of appraisals may result from the way individuals interpret their emotions: While for some individuals a stressor signals a threat, because it elicits negative emotions over which they have no control, others may appraise the same stressor as a challenge, as an opportunity, because they interpret those negative emotions as facilitative. Consequently, we propose that interpreting anxiety as facilitative moderates the relationship between anxiety and stress appraisals: we expect a negative relationship between anxiety and threat appraisals when the levels of interpreting anxiety as facilitative are high (Hypothesis 1) and a positive relationship between anxiety and challenge appraisals when the levels of interpreting anxiety as facilitative are high (Hypothesis 2).

The present study looks at how interpreting anxiety as facilitative relates with different outcomes during a stressful time period. As differences in how people interpret their emotions can influence emotional outcomes during stressful situations and transition periods (e.g., Kappes & Schikowski, 2013), we suggest that interpreting anxiety as

facilitative would be negatively associated with emotional exhaustion (Hypothesis 3). Emotional exhaustion refers to the feelings of being emotionally overextended and having depleted one's emotional resources (Evers, Tomic, & Brouwers, 2004), and can be the result of chronic negative emotions and ineffective regulation of these emotions (e.g., Chang, 2009; Hsieh, Jin, & Guy, 2012).

Finally, we expect interpreting anxiety as facilitative to be positively associated with academic performance (Hypothesis 4). This is based on the assumption that emotions serve as information (e.g., mood-as-input model; Clore et al., 1994), and therefore signal when it is required to work with more effort. Participants who pay attention to their anxiety, and embrace the facilitative dimension of anxiety, may also use their anxiety as a signal to work harder. In order to test these hypotheses, the present study implements a diary study design. Diary studies are especially appropriate for studying psychological processes during events and transition times (Bolger, Davies, & Rafaeli, 2003). In order to follow within-individual changes during a stressful time period, the study involved students in the days leading up to an exam. Although not part of our hypothesis, we also looked at the changes over time, namely whether interpreting anxiety as facilitative moderates the relationship between time (decreasing time toward the exam) and emotional exhaustion. In particular, we were interested to see whether interpreting anxiety as facilitative would serve as a "buffer" against emotional exhaustion as the exam approached.

Method

Participants

One hundred and three undergraduate psychology students at a Portuguese University took part in this study. Their average age was 20 years ($SD = 3.35$); 17 were male and 86 were female. Participation was compensated with a course credit. This study was ethically approved by the scientific council of the Research Center for Psychological Research and Social Intervention (CIS-IUL) at ISCTE-University Institute of Lisbon.

Measures

As the questions were to be answered online during several days, we wanted to reduce possible withdrawal during the data collection phase. In order to avoid fatigue and increase compliance, scales such as the emotional exhaustion subscale as well as the stress appraisal subscales were kept as short as possible, including only the essential items. Therefore, although we were aware of the methodological problems with shorter versions, the literature indicates that short scales can be just as valid as longer scales, and are often acceptable for diary designs (see Mathews, Kath, & Barnes-Farnell, 2010).

Anxiety

Levels of anxiety were measured with four items: anxious, afraid, nervous, and stressed. These items were chosen from the 10 negative items of the Positive and Negative Affect Schedule – Expanded Form (PANAS-X) (Watson & Clark, 1994), as representing most closely the emotions experienced in anxiety-related states in terms of the circumplex model of affect (high activation and negatively valenced emotions; Feldman, 1995; Russell, 1980). These items were grouped into a unitary scale measuring daily levels of anxiety.

Emotional exhaustion

This was measured using three items from the Emotional Exhaustion subscale of the Maslach Burnout Inventory (Maslach, Jackson, & Leiter, 1996). Schwarzer, Schmitz, and Tang (2000) describe fatigue, debilitation, loss of energy, and feeling worn out as the characteristics of emotional exhaustion. The three items chosen to represent this construct in terms of its short-term effects of fatigue and exhaustion were “emotionally drained,” “used up” and “frustrated.” For the above two measures the instructions were: “Please indicate to what extent you have felt this way today.”

Stress appraisals

These were measured using adapted versions (rewording the instructions to refer to the upcoming exam) of the Challenge and Threat Appraisal subscales from the Stress Appraisal Measure (Peacock & Wong, 1990). Challenge appraisals refer to evaluating a situation as an opportunity for self-growth, while threat appraisals occur when a person evaluates the situation as a source of failure, for which they do not have the resources to cope with (Drach-Zahavy & Erez, 2002). Challenge and threat appraisals involved two items for each. The instructions were “How do you think and feel about the upcoming exam?” Example items were “I perceive it as threatening” (threat appraisals) or “I perceive it as a challenge that I can overcome” (challenge appraisals).

Interpreting anxiety as facilitative

To what extent students interpret their anxiety as facilitative was measured with four items, assessing if students interpreted their anxiety as helpful to their studying. Sports psychologists tend to measure competitive anxiety in terms of facilitative versus debilitative anxiety (Jones, 1995). Therefore, we chose items based on the Competitive State Anxiety Inventory-2 (CSAI-2) which measures facilitative anxiety in sports performance (Martens, Burton, Bump, Vealey, & Smith, 1990). Instructions were “If you were feeling anxious or worried today, how did you experience this worry/anxiety?” Sample items were “anxiety helped me focus on my work” or “anxiety gave me energy to work on my studies.”

Academic performance

This was measured with the exam grade and the overall course grade at the end of the year. Both grades range from 0 to 20, where 20 is the top mark. The exam grade was based on the exam at the end of the 10 days; the final grade reflects both this exam and another exam afterward.

Control variables

In order to control for alternative explanations, we included four items from the PANAS-X measuring positive activating emotions in line with the circumplex model of affect (Russell, 1980; Watson & Clark, 1994), and two items measuring reappraisal, which is a strategy for regulating emotions and involves a change in thinking about the situation (Gross & John, 2003). With a single item, we also measured general motivation (Dörnyei

& Ushioda, 2011) as a control variable only. In the questionnaire, positive emotions and general motivation were mixed with the items measuring the levels of anxiety and emotional exhaustion, and reappraisal was mixed with the items measuring interpreting anxiety as facilitative. Response options (except for academic achievement) for all scales ranged from 1 (do not agree) to 5 (agree).

Procedure

Scales which did not have a validated Portuguese version were translated (and back-translated, to ensure accuracy) into Portuguese. After completing an informed consent form, participants were instructed to complete an online questionnaire every night for 10 days. On the 11th day, the students took the exam. Reminders to complete the questionnaire were sent out every second day. The average number of days reported by participants was 8 days ($M = 8.54$; $SD = 1.99$). In dealing with missing data, we followed the suggestion made by Woltman, Feldstain, MacKay, and Rocchi (2012) who argue that maximum likelihood estimation does not require that subjects have an equal number of data points, and is therefore optimal for repeated measures datasets with missing data. Compared to classical analyses (analysis of variance/repeated measures), multi-level modeling can include people with missing data and therefore provides a more appropriate picture of the data (Woltman et al., 2012). However, we decided to filter out those participants with only one observation (reducing the number of participants from 103 to 101).

Results

The data were analyzed using multilevel modeling in HLM 6. Multilevel modeling is appropriate for analyzing longitudinal data, as it analyzes data in its different, hierarchical levels (i.e., nested data). Multilevel modeling can analyze longitudinal data by including within- and between-person levels of analysis; therefore, it can separate the changes within one individual and differences between individuals (Kwok et al., 2009). Level-1 predictors were group-mean-centered to examine the effects of fluctuating emotional states and appraisals within individuals. Each of the daily measures was analyzed with an unconditional model (no predictor), in order to estimate the level of within-person variance for each measure. These analyses showed that all measures had sufficient variability, which enabled us to conduct the within-person analyses. Table 1 illustrates the descriptive statistics, internal consistency, and coefficients for all variables. In line with Hypothesis 1, we found that interpreting anxiety as facilitative moderated the relationship between experienced anxiety and threat appraisals. The gradients of the simple slope suggest that the relationship between anxiety and threat stress appraisals was more positive when students did not interpret their anxiety as facilitative, in particular when experiencing high levels of anxiety (see Table 2).

As we proposed in Hypothesis 2, interpreting anxiety as facilitative moderated the relationship between anxiety and challenge appraisals. The gradients of the simple slope values indicate that the relationship between anxiety and challenge stress appraisals was more positive for students when they experienced high levels of anxiety and interpreted their anxiety as facilitative (see Table 2). Note that all results are based on robust standard errors. Table 2 illustrates both moderation analyses; each with the intercept, the two main

Table 1. Descriptive statistics and coefficients.

Parameter	Mean	SD	1	2	3	4	5	6
1. Interpreting anxiety as facilitative	3.07	.87	(.94)					
2. Challenge stress appraisals	3.47	.98	.14**	(.68)				
3. Threat stress appraisals	2.46	1.12	-.07	-.06	(.74)			
4. Anxiety	2.48	1.09	-.07	-.04	.37**	(.90)		
5. Emotional exhaustion	2.10	1.11	-.15**	-.05	.23**	.39**	(.87)	
6. Exam grade	12.45	2.87	.48**	.31*	-.20	-.12	-.23	
7. Final grade	13.60	2.27	.30*	.13	-.28*	-.08	-.07	.38**

Note: All variables are at the within-person level (Level 1), except for exam grade and final grade which are between-person (Level 2). Exam grade: min: 7/max: 19. Final grade: min: 6/max: 19 (scale of 0–20). Alpha values are given in parentheses.

$N = 860$ (Level 1), $N = 101$ (Level 2), * $p < .05$, ** $p < .01$.

effects (interpreting anxiety as facilitative and levels of anxiety), and the interaction (interpreting anxiety as facilitative $\times$ levels of anxiety). These moderations remained significant when controlling for positive emotions, reappraisal (emotion regulation strategy), and general motivation.

Furthermore, interpreting anxiety as facilitative was negatively associated with emotional exhaustion (Hypothesis 3; see Table 1). We also found that interpreting anxiety as facilitative may have played a role in serving as a buffer against emotional exhaustion as the exam approached: interpreting anxiety as facilitative was found to moderate the relationship between emotional exhaustion and time (decreasing time toward the exam).

Table 2. Multiple regression analyses examining the moderating effect of interpreting anxiety as facilitative on stress appraisals.

Parameter	<i>b</i>	SE	<i>t</i>	Simple slope (–1 SD)	Simple slope (+1 SD)
<i>Dependent variable: threat stress appraisals</i>					
Intercept	–.03	.09	–.32		
Interpreting anxiety as facilitative	–.05	.04	–1.19	.24	.06
Anxiety	.15**	.03	4.72		
Interaction	–.09**	.03	–3.11		
<i>Variance</i>					
Between-variance	.74870				
Within-variance	.22806				
<i>Dependent variable: challenge stress appraisals</i>					
Intercept	–.02	.08	–.19		
Interpreting anxiety as facilitative	.13**	.04	3.73	–.15	.13
Anxiety	–.01	.03	–.32		
Interaction	.14**	.04	3.38		
<i>Variance</i>					
Between-variance	.69273				
Within-variance	.29692				

Note: Variables are centered at the group level.

** $p < .01$.

The simple slope gradients indicate that when interpreting their anxiety as facilitative students experienced lower levels of emotional exhaustion as the exam approached [for the intercept: $b = .02$; $SE = .08$; $t = .23$; $p = .82$; for interpreting anxiety as facilitative: $b = -.14$; $SE = .04$; $t = -3.57$; $p < .001$; for time: $b = -.01$; $SE = .01$; $t = -.58$; $p = .56$; for the interaction: $b = -.04$; $SE = .02$; $t = -2.30$; $p = .02$; simple slope at low mediator (-1 SD): $.03$; simple slope at high mediator ($+1$ SD): $-.05$]. Note that “Time” indicates the decreasing time toward the exam (day 1–10). Finally, in line with Hypothesis 4, interpreting anxiety as facilitative was positively associated with academic performance (both exam grade and final course grade; see Table 1). The results for Hypotheses 3 and 4 also remain significant when controlling for positive emotions, reappraisal, and general motivation.

Discussion

The present study suggests that some people can thrive on stressors, if they can interpret their anxiety as facilitative. As expected, interpreting anxiety as facilitative was positively associated with appraising the stress of the upcoming exam as a challenge, in other words as something positive. Even when students experienced high levels of anxiety, the fact that they interpreted anxiety as a facilitative emotion allowed them to appraise the stressor as a challenge and not as a threat. Challenge stress appraisals tend to be characterized by a belief that by putting in more effort people can overcome the stressor (LePine, Podsakoff, & LePine, 2005). Challenge stress appraisals are therefore usually associated with enhanced performance (Drach-Zahavy & Erez, 2002), and this process may have played a role in the relationship between interpreting anxiety as facilitative and academic performance (as interpreting anxiety as facilitative was positively associated with grades). Furthermore, interpreting anxiety as facilitative was negatively associated with emotional exhaustion.

It is not clear how stress appraisals come about, and research has usually focused on the link that stress appraisals elicit emotions (e.g., Lazarus, 1991; Rodell & Judge, 2009). However, the present findings suggest that emotions and how people interpret these emotions can influence how a stressor is appraised. We propose that this process may explain why people differ in how they experience a stressful time (e.g., when faced with the same stressor, as in the present study). Why some people thrive on stress and perceive stressors as motivation, whereas others feel threatened and debilitated by stressors, may be explained by how these individuals differ in how they interpret their negative emotions. If anxiety, which can be a distressing emotion and which has the potential to be experienced as either extremely debilitative or extremely facilitative, is interpreted as facilitative, then individuals can also experience stress as motivation. The moderation analyses indicate that this difference can only be seen when the levels of anxiety are high: at low levels of anxiety, interpreting anxiety as facilitative had little effect on making challenge or threat appraisals. However, at high levels of anxiety, interpreting anxiety as facilitative can affect whether a stressor is appraised as a challenge or as a threat. This finding extends previous research on cognitions about emotions and how these affect appraisal at a within-individual level. For example, research on fear of emotions indicates that this goes hand in hand with nonacceptance of emotions (e.g., Roemer et al., 2009). Furthermore, fear and nonacceptance of emotions tend to be associated with appraising events and situations with some degree of uncertainty as threatening (Buhr & Dugas,

2006). In the same way, a stressor, as it often tends to represent an uncertain situation, may evoke this threat appraisal in people who fear their own emotional reactions. Less controllability over emotions is associated with a greater fear of emotions (Stapinski, Abbott, & Rapee, 2010), and may therefore explain why the differences in stress appraisals in the present study were only visible when the levels of anxiety were high.

As stressful situations such as an exam approach, people tend to become more nervous or anxious and demonstrate symptoms of emotional exhaustion (e.g., Carter, Williams, & Silverman, 2008). Negative emotions can therefore result in emotional exhaustion (e.g., Chang, 2009). However, as we see in the present study, when individuals can interpret anxiety as facilitative, they are less likely to suffer from emotional exhaustion. This indicates that during a stressful experience, how individuals interpret their anxiety may reduce the negative effects that emotions can have on emotional exhaustion. This supports the assumption that not negative emotions per se, but rather the regulation of these negative emotions, may have an effect on emotional exhaustion (e.g., Van Gelderen, Bakker, Konijn, & Demerouti, 2011). It is important for students to learn to manage their anxiety, as anxiety can be detrimental at school and university, for example, in the form of test-anxiety (Hembree, 1988). If students cannot manage this anxiety, it can overwhelm and decrease concentration and motivation (Hancock, 2001). Previous research has pointed to the negative effects anxiety can have on academic performance (e.g., Hembree, 1988). However, in the present study, we found that interpreting anxiety as facilitative was positively associated with the exam grade and the final grade, suggesting a need for students to learn how to control and take advantage of their anxiety, which may simply involve thinking about anxiety in a different way.

In conclusion, the findings of this study indicate how the way we think about our emotions affects a range of different outcomes. By interpreting their anxiety as facilitative, students appraised the approaching stressor as a challenge, even when experiencing high levels of anxiety. Furthermore, interpreting anxiety as facilitative was associated with favorable outcomes (negatively associated with emotional exhaustion and positively associated with academic performance). These findings suggest that the overall stress experience (in the form of appraisals, emotional outcome, and performance) may largely be affected by how we interpret our negative emotions. Whether or not anxiety has a negative effect on our well-being or performance may depend on the way we interpret our emotions.

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