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## Individual differences in emotion elicitation in university examinations: A quasi-experimental study

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### ABSTRACT

In a quasi-experimental study, we examined the role of individual differences in the elicitation of emotional states in university examinations. Specifically, we assessed emotional states (a) before the first examination (baseline), (b) after receiving positive or negative feedback, and (c) then, again, before a series of subsequent examinations. We also measured effort in examination preparation and interest for studying. Data were collected during a university course that consisted of seven examinations in one semester; and 94 female students completed the BIS/BAS scales and SPSRQ (to measure sensitivity to punishment, SP, and reward, SR). Results revealed that higher BAS, but not SR, individuals experienced higher positive affect (PA) following positive feedback and they also showed higher levels of interest in studying. More generally, higher BIS and SP individuals experienced higher level of negative affect (NA) and they invested more effort in examination preparation; and both higher levels of SP and SR correlated positively with NA after receiving negative feedback. In addition, following negative feedback, higher BAS individuals experienced lower levels of PA, and higher SR individuals invested less effort in examination preparation. Results are discussed in terms of the reinforcement sensitivity theory (RST) of personality and directions for future research.

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### 1. Introduction

Academic tasks are prone to evoke a variety of emotions in students, and these emotional experiences impact academic performance. In this context, test anxiety is one of the most common emotional experiences (Pekrun, Goetz, Titz, & Perry, 2002), and it correlates negatively with: (a) cumulative grades-point average (Diener, Schwarz, & Nickerson, 2011); (b) academic performance (Pekrun, Elliot, & Maier, 2009); and (c) students' health (Conley & Lehman, 2012). Test anxiety and emotional reactivity to test feedback are influenced by both situational and trait factors (Putwain, Woods, & Symes, 2010). In addition to the main effect of examination-related situational anxiety, individual differences in reactions involve achievement goals (Putwain & Daniels, 2010; Putwain & Symes, 2012; Putwain et al., 2010), neuroticism (Chamorro-Premuzic, Ahmetoglu, & Furnham, 2008), perfectionism (Stoeber, Feast, & Hayward, 2009), locus of control (Davis & Davis, 1972), and even a birth order (Sarason, 1969).

Test anxiety is a multidimensional construct consisting of cognitive and emotional factors (Cassidy & Johnson, 2002), with worry

being the most important cognitive feature (Øktedalen & Hagtvet, 2011). Recent studies call attention to the role played by metacognitive aspects, such as beliefs about cognitive competence, uncontrollability and danger, and cognitive self-consciousness or automatic thoughts, such as fear of failure and fear of disappointing parents (Živčić-Bećirević, Juretić, & Miljević, 2009). Besides metacognitive factors in test anxiety, the most studied and important personality factors are neuroticism (Chamorro-Premuzic et al., 2008; Dobson, 2000; Halamandaris & Power, 1999) and trait anxiety (Beidel & Turner, 1988; Elliot & McGregor, 1999). Moreover, it seems that personality traits play the most important role in test anxiety. Specifically, neuroticism is a better predictor of test anxiety than core self-evaluation (Chamorro-Premuzic et al., 2008), such as self-efficiency, self-esteem and locus of control (Judge & Bono, 2002). This is not surprising given that general anxiety is one of facets of neuroticism in the five-factor model (Costa & McCrae, 1992). Thus, as test anxiety shares many conceptual characteristics with traits reflecting anxiety or negative emotionality, correlations between them may be a result of conceptual similarities rather than an effect of some explanatory mechanism.

There are a number of unresolved issues in the test anxiety literature. First, there has been little research on other emotional states experienced during situations that evoke test anxiety,

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specifically broader positive and negative affectivity. Secondly, little attention has been paid to the role of individual differences that could explain variation in these states. Thirdly, we do not know how past test feedback influences emotion elicitation in subsequent examinations – this is likely to be important in terms of emotional and motivational knock-on effects. To address these issues, we explore: (a) the role of trait individual differences in emotional states prior to an examination (test anxiety); (b) after the examination feedback is provided; and (c) once again just before the student sits subsequent examinations.

One lens through which to view individual difference in such emotional states is afforded by the reinforcement sensitivity theory (RST) of personality (Corr, 2013). RST was originally based on the studies of reactions to punishment and reward in typical animal learning paradigms. In its current form (Corr & McNaughton, 2008, 2012) it postulates three general domain systems explaining reactions to reward, punishment, and their conflict. The Behavioral Approach System (BAS) mediates reactions to all appetitive stimuli (which include relief from nonpunishment). The Fight/Flight/Freezing System (FFFS) mediates reactions to all aversive stimuli (which include frustrative non-reward). The Behavioral Inhibition System (BIS) is hypothesized to be active in conflict situations that entail specific opposing approach (BAS) and avoidance (FFFS) goals, as well as goal-conflict more generally. Individuals higher on the BAS are proposed to be higher on extraversion and impulsivity; whereas individuals higher on the BIS are proposed to be higher on neuroticism and anxiety; and finally, the FFFS is a defensive mechanism that underlies fear and panic and, like the BIS, is related to neuroticism (Corr, DeYoung, & McNaughton, 2013). In general terms, variation in BAS reflects sensitivity to reward, while the variations in BIS and FFFS together reflect sensitivity to punishment (Corr, 2008; this provides a summary of RST). In this study, we do not differentiate the FFFS and BIS, but treat both as reflections of different aspects of punishment sensitivity.

The first aim of this study is to explore the role of sensitivity to reward and sensitivity to punishment in examination test settings in terms of the elicitation of positive and negative emotional states; and the second aim is to examine the emotions evoked by knowledge of previous examination performance (feedback). From an RST perspective, individuals higher on BIS and FFFS should be more reactive to cues of punishment and conflict. Two general hypotheses are tested. First, as the BIS (including the FFFS) mediates emotion and behavior in punishing situations, we expect a positive correlation with degree of negative affectivity generated following negative examination feedback. Secondly, sensitivity to reward (SR) or BAS should mediate reactions to both to reward and non-punishment stimuli and, thus, we expect that individuals higher on BAS and SR should feel more positive affect following favorable examination feedback.

When measuring emotional states in an academic context, there is the opportunity to conduct studies with real life observation, what Wallbott and Scherer (1989) describe as an ideal setting to study emotional experience. However, studies conducted in such settings entail methodological and ethical concerns. The strength of experimental studies is their internal validity, while for self-report studies (such as diary method sampling or correlation studies) the strength is external, or ecological, validity. In real life observation, internal validity can be diminished due to many uncontrollable factors that increase measurement error. On the other hand, mood induction in experimental studies is typically done by creating an artificial situation through presentation of stimuli, such as movie clips (Schaefer, Nils, Sanchez, & Philippot, 2010), pictures (Lang, Bradley, & Cuthbert, 2008), or music (Coutinho & Cangelosi, 2011) that provide a greater degree of experimental control, which gains much in terms of internal validity but loses in terms of external validity: this represents an

important shortcoming in comparison to those studies conducted with diary experience sampling method.

The question is how findings from more artificial mood induction procedures can be generalized to test anxiety in more realistic academic settings. For this reason, we conducted a real life, quasi-experimental, study, since this methodology provides the greatest degree of ecological validity. In addition, there are ethical concerns with studies when the lecturer is performing a study on his or her students. In order to prevent this ethical concern, it is important to ensure anonymity of the participants' data. This also has a beneficial impact on the validity of data collected because it goes a long way to avoiding socially desirable responding.

Our quasi-experimental study was designed with these theoretical and methodological considerations in mind.

## 2. Method

### 2.1. Participants

A total of 94 female university students, ranging in age from 19 to 24 years ( $M = 21.86$  and  $SD = 1.43$ ), participated in the study during an obligatory courses in their first and second academic years at the Department of psychology, University of J.J. Strossmayer, Croatia. All students participated in exchange to course credit.

### 2.2. Materials

Two questionnaires measuring personality traits, one assessing emotions, and one an evaluation list, designed specifically for this study, were administered. They were administered in the Croatian language.

#### 2.2.1. BIS/BAS Scales

BIS/BAS Scales (Carver & White, 1994) consist of 13 items to assess reactivity of the BAS, which can be measured either on a unidimensional scale or divided into three subscales: BAS Drive (4 items; example item “When I want something, I usually go all-out to get it”), BAS Fun seeking (4 items; example item “I crave excitement and new sensations”) and BAS Reward Responsiveness (5 items; example item “It would excite me to win a contest”); and 7 items to assess reactivity of the BIS (example item “I worry about making mistakes”) measured on a unidimensional scale. Items are answered on 4-point Likert scale ranging from 1 (Strongly disagree) to 4 (Strongly agree).

In this study, Cronbach alpha reliability coefficients for BAS Total, Drive, Fun-Seeking, Reward Responsiveness and BIS were .81, .80, .72, .68, and .80, respectively.

#### 2.2.2. Sensitivity to Punishment and Sensitivity to Reward Questionnaire (SPSRQ)

SPSRQ (Torrubia, Avila, Moltó, & Caseras, 2001) consists of 48 items, 24 items measuring Sensitivity to Reward (SR; example item “Does the good prospect of obtaining money motivate you strongly to do some things?”) and 24 items measuring Sensitivity to Punishment (SP; example item “Are you often afraid of new or unexpected situations?”). All items are answered on dichotomous scale of Yes/No format. In this study, Cronbach alphas for SP and SR were .85 and .77, respectively.

Both, the BIS/BAS scales and SPSRQ are translated and validated in Croatian (Krupić, Križanić, Ručević, Gračanin, & Corr, 2014).

#### 2.2.3. Positive Affect and Negative Affect Schedule (PANAS)

PANAS (Watson, Clark, & Tellegen, 1988) consists of 20 items: 10 measuring Positive Affect (PA) and 10 measuring Negative Affect (NA). All items are answered on 5 point Likert scale. In this

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