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Abstract

This paper presents a study on the impact of State Anger (SA) on Creative Process Engagement (CPE) on a daily basis in an organizational context. Applying a within-person perspective it examines the daily effect of SA on the CPE. It contemplates the role of moderators, such as: Emotion Regulation (ER) - Reappraisal (RE) and Suppression (SU); Work Engagement (WE); and High Effort Tasks (HET) in the relationship between SA and CPE. The sample in the study is of workers from two companies. Participants completed a general questionnaire and then a daily questionnaire for one working week.

1. Introduction

Creativity has been considered as a way to increase performance and to promote continuous improvements, thereby enabling an organisation to compete and survive in a demanding socio-economic environment (Baker & Sonnenburg, 2013; Hennessey & Amabile, 2010; Oldham & Cummings, 1996).

Relating creativity to mood states is one of the most enduring research topics in diverse psychological sub-areas, and it has recently gained greater attention in the organisational domain (Hennessey & Amabile, 2010; James, Brodersen & Eisenberg, 2004; George, 2007). Although the relationship between mood and creativity has been widely studied, it is nevertheless characterised by contradictory data on the role positive and negative moods play with regard to creativity (Amabile, Barsade, Muller, & Staw, 2005; Hennessey & Amabile, 2010; Shalley et al., 2004). The inconclusive findings revealed by data contradictions may suggest that the relationship between mood and creativity is vastly more complex than studies have hitherto shown.

Moreover, the research in this area is mainly carried out using the valence-based approach, which excludes other relevant affective dimensions (Zeelenberg & Pieters, 2006).

There is also a lack of attempts to study discrete emotions instead of moods (Amabile et al., 2005).

The intention of this paper is to discuss the relevance of studying a discrete emotion, such as Anger, and to try to identify some possible personal moderators of the State Anger (SA)-Creativity link.

2. Emotions and creativity – the impact of Anger on CPE

There have been two ways of studying emotions - the valence-based approach and the specific emotions approach (Lerner & Keltner, 2000; Zeelenberg & Pieters, 2004). The valence-based approach relates negative emotions to more negative consequences (e.g. dissatisfaction) and positive emotions to more positive consequences (e.g. satisfaction), and predicts that emotions of the same valence would produce similar judgements. The specific emotions approach tries to specify how different emotions of the same valence have different behavioural tendencies and behavioural consequences (Lerner & Keltner, 2000). This approach highlights the idiosyncratic elements of each emotion, i.e., each emotion can have different appraisal tendencies, behavioural tendencies and behavioural consequences (Frijda, 1988, 2005; Frijda & Zeelenberg, 2001; 1990; Rosenam, Wiest & Swartz, 1994).

Organisational creativity is defined as the product or the outcome of bringing up new and useful ideas through work procedures, that could add value to what is produced, to the service delivered, or to the employees' performance (Amabile, 1983; Amabile, Conti, Coon, Lazenby & Herron, 1996; George, 2007; Oldham, 2003; Shalley et al., 2004). Although creativity could be understood as a process, or a product (an observable outcome), the latter is the response or result of the process (Amabile, 1983).

The conceptual definition of creativity in the organisational context is more objective than the operational definition, which relies on subjective criteria – the independently appropriate observers' appraisal of what creativity is (Amabile, 1982; 1983). The creative process engagement is defined “as employee involvement or engagement in creativity-relevant cognitive processes, including (1) problem identification, (2) information searching and encoding, and (3) generation of ideas and alternatives.” (Zhang & Bartol, 2010, p. 5) So, CPE is the creative process that could be measured on a daily basis and from which creative outcomes result.

This study considers one particular emotion – Anger – and aims to understand its impact on the creative process in the workplace. Anger is a commonly identified emotion in the work context (Basch & Fisher, 1998) and it is related to antecedents such as perceptions of unfairness and injustice, goal interference and interpersonal conflict (Fitness, 2000; Gibson &

Callister, 2010). As one of the most common and studied emotions with great social impact (Berkowitz & Harmon-Jones, 2004), Anger is defined “as a syndrome of relatively specific feelings, cognitions, and physiological reactions linked associatively with an urge to injure some target.” (p.108). Negative emotions have been related to avoidance tendency, whereas anger is associated with approach tendency (Carver & Harmon-Jones, 2009). Since Anger is characterised by appraisals of certainty and control, there is less systematic and detailed information processing (compared to sadness), but it activates more widespread associative networks (Baas, De Dreu & Nijstad, 2011; Bodenhausen, Sheppard & Kramer, 1994; Lerner & Tiedens, 2006; Gilet & Jallais, 2011).

There are few studies relating to Anger and Creativity and those there are, were carried out in an experimental setting (e.g. De Dreu, Baas & Nijstad, 2008; Baas et al., 2011).

Although Anger reveals increased creativity in tasks in prior phases, by producing more original ideas, (but generating distractibility due to unsystematic and unstructured thinking) it shows a resource depletion effect in later phases (Baas et al., 2011). The knowledge provided by these data in an experimental context leads to the need to appraise this anger-creative process in a natural organisational context. This could be achieved by studying a set of variables which, in a work context, can moderate the relationship between Anger and the decrease in creativity across time, such as Emotion Regulation (ER) (Reappraisal and Suppression) (Gross, 1998a, 1998b), Work Engagement (WE) (Bakker & Demerouti, 2008), High Effort Tasks (Converse, DeShon, 2009).

3. The role of Moderators into the SA – CPE link

Resource Depletion and High Effort Tasks

As revealed above, Resource Depletion is not only due to proper Anger cognitive function from the process of idea generation, but ER can also contribute to it (Muraven & Baumeister, 2000; Goldberg & Grandey, 2007).

ER is seen as a process that could benefit individuals by helping them to achieve goals and improve job performance; however the resources available at the time are seen as scarce designated as a Regulatory Depletion Effect (Converse, DeShon, 2009). This effect is related to a depletion of motivational and cognitive resources, such as energy and attention. In contrast to this view, there is an alternative perspective – Adaptation Level Theory – meaning that when individuals have the opportunity to adapt to the level of exertion in a subsequent task, the depletion effect would never be revealed (Converse, DeShon, 2009).

H1 – The relationship between SA and CPE is expected to be mediated by Resource Depletion (RD). That is, when RD is present the SA-CPE link becomes negative.

H1a – The relationship between SA and RD is expected to become negatively significant by the moderating effect of HET. That is to say, feeling SA and being involved in a high level of exertion could prevent RD.

Emotion Regulation

Since ER has been most studied in the domain of Emotion Labor studies it is relevant to relate it to general work activities and, in particular, to its influence on the creative process.

ER is a competence that could increase, maintain or decrease positive or negative emotions. There are two forms of ER - the Antecedent-Focused Regulation and the Response-Focused Regulation (Gross, 1998a, 1998b, 2002; Gross & Thompson, 2006). The former relates to what can be done before emotion starts, such as Reappraisal – that changes the situation in a cognitive way to alter emotional impact. The latter refers to strategies that come late in the emotion process, when emotion is occurring, such as Suppression – diminishing expressive behaviour.

It is known that the intensity level of an emotion determines creative outcomes, which means that low and extremely high intensity have a negative impact on creativity (James et al., 2004). Therefore it is important to regulate Anger to a level that could be functional in a particular task.

H2- The relationship between SA and CPE, will be increased positively in the presence of ER, especially in the presence of SU strategies rather than in the RE strategies.

Work Engagement

Compared to other job attitudes WE proved to have a great impact on overall contributions to an organization (Dalal, Baysinger, Brummel & LeBreton, 2012). Being negatively related to Burnout, WE is conceptualized as the opposite of emotion exhaustion (Langelaan, Bakker, Doornen & Shaufeli, 2006).

WE is associated with workers' psychological resources, such as sensitiveness to opportunities at work and more confidence and optimism (Bakker & Demerouti, 2008). As a work-related state of mind, WE is characterized by Vigour, Dedication, and Absorption (Bakker & Demerouti, 2008). Vigour is defined by high levels of energy and mental resilience while working. Dedication is related to the degree of involvement in work and experiencing a sense of significance, enthusiasm, and challenge. Absorption means being fully focused on work, and having difficulty detaching from work. Engaging in work implies high levels of energy.

H3- The relationship between SA and CPE is expected to increase positively in the presence of WE.

4. Method

Participants and Procedure

The participants were recruited from two companies. They are IT Consultants and Financial Analysts who are required to deliver a high level of creativity performance. A total of 129 workers agreed to participate in the study.

This study used a web-based survey tool (Qualtrics), through which employees received questionnaires. First, participants filled out a general online questionnaire at the beginning of

the study - appraising stable variables such as ER; HET, WE and demographics. Then two days later, at the end of every working day (for one working week) participants filled out an online questionnaire appraising the impact Anger had had on their CPE. They were asked to consider the following variables: State Anger; RD; and CPE. The daily questionnaires needed to have been completed for at least three days out of the five required. The final sample comprises 119 participants with 326 responses ($M = 2.9$ days per person, $SD = 1.4$).

The majority of participants (71.4%) are male. The average age is 31.6 years ($SD = 6.2$), ranging from 23 to 53 years. The majority of participants (71%) had worked at the company for 5 years or less. Almost all of the participants have a high school diploma (92.9%).

Measures

General questionnaire

Emotion Regulation Questionnaire *Emotion Regulation Questionnaire* – measured by two scales developed by Gross & John (2003). The first is measured by a 6-item reappraisal scale (**RE**) (e.g. “I control my emotions by changing the way I think about the situation I’m in”). The Alpha Coefficient was .83. The second is measured by a 4-item suppression scale (**SU**) (e.g., “I control my emotions by not expressing them”) on a 5-point scale ranging from 1 (not at all) to 5 (very much). The Alpha Coefficient was .83.

Work Engagement – Utrecht Work Engagement Scale (UWES) – Short version (Shaufeli, Bakker & Salanova, 2006), measured by a 9-item scale (e.g. “At my work, I feel bursting with energy.”), on a 5-point scale ranging from 0 (never) to 5 (always). The Alpha Coefficient was .90.

High Effort Tasks - measured by 6 items from two subscales - task significance and autonomy as done previously by Joo & Lim (2009). These subscales are from the study on perceived job complexity carried out by Hackman & Oldham (1980). The Alpha Coefficient was .66.

Daily questionnaire

State Anger-Scale - State Anger-Scale Spielberger (Forgays, Forgays & Spieberger, 1997) – measured by a 10-item scale (e.g. “I’m furious.”) on a 4-point scale ranging from 1 (almost never) to 4 (almost always). The State Anger scale measures the intensity of angry feelings at a designated time and comprises two subscales: experiencing angry feelings; and feeling like expressing anger. The Alpha Coefficient was .93.

Creativity Process Engagement (CPE) - measured by an 11-item scale (e.g. “I have spent considerable time trying to understand the nature of the problem.”) developed by Zhang and Bartol (2010a), answered on a 5-point scale ranging from 1(never) to 5 (very frequently). The Alpha Coefficient was .94.

Resource Depletion – measured by the subscale of emotion exhaustion developed by Malash & Jackson (1981). Six items out of nine were considered. The word *today* was added to the items selected (e.g. “I have felt emotionally drained by my work *today*.”). Only one dimension to rate each item was considered - strength (instead of frequency) on a 7 -point scale ranging from 0 (never) to 7 (very strong, major). One item was not considered because it showed low communalities, lower than .30. The Alpha Coefficient was .91.

5. Results

Descriptive statistics

Table 1 shows descriptive statistics and inter-correlations among study variables.

The relationship between SA and CPE ($r = .176$, n.s.) is not significant. There is a significant positive relationship between SA – HET ($r = .202$, $p < .01$) and SA – RE ($r = .094$, $p < .10$).

There is a significant positive relationship between CPE and the moderators considered: CPE – RE ($r = .130$, $p < .05$); CPE – HET ($r = .166$, $p < .01$); CPE – WE ($r = .146$, $p < .01$).

Table 1 - Means, standard deviations and correlations of Person-Level and Day-Level Variables and correlations between the two level

<u>Person-level variables</u>	Mean	SD	1 RE	2 SU	3 HET	4 WE	5 SA	6 RD	7 CPE
1. RE	3.17	0.68	—	.204†	.084	-.077	.123	.107	.197†
2. SU	2.96	0.80	.185**	—	-.091	-.136	-.097	-.212†	-.209†
3. HET	1.87	0.63	.083	-.115*	—	-.139	.264*	.461**	.207†
4. WE	3.56	0.72	-.083	-.155**	-.160**	—	-.061	.350**	.165*
<u>Daily-level variables</u>	Mean	SD	1 RE	2 SU	3 HET	4 WE	5 SA	6 RD	7 CPE
5. SA	1.15	0.39	.094†	-.065	.202**	-.052	—	.482**	.176
6. RD	1.48	1.58	.076	-.148**	.391**	-.276**	.473**	—	.218†
7. CPE	2.98	0.87	.130*	-.182**	.166**	.146**	.094	.179**	—

† p < .10 * p < .05 **p < .01 Person –level correlations are above the diagonal (N=78) Day-level correlations are below the diagonal (N=326). *RE* – Reappraisal; *SU* – Suppression; *HET* – High Effort Task; *WE* – Work Engagement; *SA* – State Anger; *RD* – Resource Depletion; *CPE* – Creative Process Engagement.

Hypothesis Testing

To test the hypothesis it was used a Repeated Measures Design (RMD) (Heck, Thomas, Tabata, 2010), to analyse the development processes whether a change occurred on individuals during a specific period of time. As a specific type of Multilevel Analysis, the repeated measures nested within-individuals (level 1) show the change in individuals and the differences between-individuals (level 2) revealing idiosyncratic characteristics responsible for differences among the sample studied.

Considering **H1** (*The relationship between SA and CPE is expected to be mediated by Resource Depletion, which will negatively affect the SA-CPE link*) it was firstly regressed RD (Table 2) to analyse whether HET could have a prevention effect on RD (**H1a** – *The relationship between SA and RD is expected to become negatively significant by the moderating effect of HET. That is, feeling SA and being involved in a high level of exertion could prevent RD*).

In Model 1 (Table 2) SA and HET were included to control a main effect on RD. HET and SA are positively related to RD ($r = .75, p < .01$) ($r = 1.77, p < .01$) respectively. As can be seen from Model 2 (Table 2) by the interaction effect of SA and CPE ($r = -1.15, p < .05$) the **H1a** was supported.

In Table 3 from Model 1 explaining CPE there is not a significant positive relationship between SA and CPE ($r = .16, n.s.$) and in Model 2 by including RD the relationship between SA and CPE became negative ($r = -.01, n.s.$). This means that it is not possible to consider a mediation effect so **H1** was not supported.

Testing **H2** (*The relationship between SA and CPE will be increased positively in the presence of ER, especially in the presence of SU strategies rather than in RE strategies*) in Table 3 from Model 4 it is shown that the relationship between SA and CPE became positively significant ($r = .50, p < .05$) by the interaction effect of SU, which supports **H2**.

The **H3** (*The relationship between SA and CPE is expected to increase positively in the presence of Work Engagement*) was not supported ($r = -.38$, n.s.) according to the interaction effect with SA into CPE in Model 4 (Table 3).

Table 2 – Fixed-Effect Estimates (Top) and Variance-Covariance Estimates (Bottom)
for Models Predicting RD

Parameters	Resource Depletion		
	Null Model	Model 1	Model 2
Fixed Effects			
Intercept	1.24 (.144)**	-2.04 (.40)**	-4.81(1.11)**
Time		.04(.04)	.06(.05)
HET		.75(.18)**	1.98(.49)**
SA		1.77(.20)**	4.36(.99)**
Interaction terms			
HET x SA			-1.15(.43)*
-2 x log likelihood	1108.31	1020.77	1014.20
Difference of -2xlog	—	87.54	6.57
Df	6	12	12

Note: The Standard Errors are in parentheses. *HET* – High Effort Task; *SA* – State Anger.

† p < .10 * p < .05 **p < .01

Table 3 – Fixed-Effects Estimates (Top) and Variance-Covariance Estimates (Bottom) for Models Predicting CPE

Parameters	Creative Process Engagement				
	Null	Model 1	Model 2	Model 3	Model 4
Fixed Effects					
Intercept	3.13(.08)**	2.55 (.26)**	2.75 (.27)**	1.22 (.58)*	-.27(1.28)
Time		-.09 (.03)**	-.09 (.03)**	-.09 (.03)**	-.10(.03)**
HET		.22 (.12)*	.15 (.12)	.15 (.11)	.15(.11)
SA		.16 (.12)	-.01 (.14)	-.0.6 (.14)	1.34(1.08)
RD			.10 (.03)**	.11 (.03)**	.12(.08)
RE				.32 (.10)**	.77(.32)*
SU				-.18 (.08)*	-.71(.28)*
WE				.30 (.09)**	.71(29)*
Interaction terms					
SA x RD					-.01(.06)
SA x RE					-.41 (.29)*
SA x SU					.50 (.25)*
SA x WE					-.38 (.25)*
-2 x log likelihood	733.73	729.568	727.325	716.137	714.65
Difference of -2xlog	_____	4.162	2.243	11.188	1.487
Df	6	12	13	16	20

Note: The Standard Errors are in parentheses. *HET* – High Effort Task; *SA* - State Anger; *RD* – Resource Depletion; *RE* – Reappraisal; *SU* – Suppression; *WE* – Work Engagement.

† p < .10 * p < .05 **p < .01

6. Discussion

Despite having been widely studied, the relationship between moods and creativity is characterised by inconclusive findings regarding the role of negative emotions in the creative process (Amabile et al., 2005; Hennessey & Amabile, 2010; Shalley et al., 2004). The contradictory data about the role played by negative moods with regard to creativity may suggest a deeper and more complex process that needs to be studied in greater depth. In addition, the research approach used to study negative affect-creativity link should include more dimensions besides valence. Thus, studying negative discrete emotions could be a great research opportunity with much to contribute to such an extremely challenging area as the role of affect (in particular negative affect) in organisations.

This paper aims to discuss the relevance of focusing on a specific emotion - such as Anger with its idiosyncratic characteristics - in an organizational context in a longitudinal setting. Some possible personal moderators were identified that could improve the SA-Creativity link. Gaining greater knowledge about some significant moderators could be a way to promote the conditions that foster creativity when feeling Anger. The moderators considered were Emotion Regulation (suppression and reappraisal), High Effort Tasks, Work Engagement and Resource Depletion.

As with the majority of studies in this area (Baas et al, 2008; George & Zhou) no direct relationship between SA and CPE was found.

Contrary to what was expected (Baas et al., 2011) Resource Depletion showed a positive significant relationship with CPE. This data should be questioned in relation to the sample studied. At this time of financial crisis in Portugal, companies are struggling to survive and this is reflected in the extra effort workers are being asked to make to achieve more with fewer resources (including human resources).

Therefore, H1, which posited that the mediating effect of Resource Depletion would negatively affect the SA-CPE link was not supported. SA did not reveal any direct positive relationship with CPE that could show how a mediation effect could negatively impact this relationship. However, the negative relationship expected between SA and RD as a result of

the moderating effect of HET, posited in H1a was supported. This reveals an important moderation effect – i.e. an individual could adapt their level of exertion to prevent the depletion of resources by SA impact. These results are in line with the Adaptation Level Theory which asserts that when individuals have the opportunity to adapt to the level of exertion in a subsequent task, the depletion effect would never be revealed (Converse, DeShon, 2009).

The role of Emotion Regulation was addressed in H2 which posited there would be a positive significant increase in the SA-CPE link in the presence of Suppression strategies as opposed to Reappraisal strategies. The data supported H2, thus revealing that when State Anger occurs, the Suppression strategies have an impact on regulating the level that could be adapted to the task. As James et al, 2004 have noted, low and extremely high emotional intensity have a negative impact on creative outcomes.

In spite of the relevance of Work Engagement relevance compared to other job attitudes and its proven impact on organisational results (Dalal, Baysinger, Brummel & LeBreton, 2012), the moderating effect expected of WE with regard to positively increasing the SA-CPE link posited in H3 was not relevant. Since WE is the opposite of emotion exhaustion, it being negatively related to Burnout (Langelaan, Bakker, Doornen & Shaufeli, 2006) and the great impact of Resource Depletion in this sample it is difficult to understand what the impact of WE would be in these conditions.

7. Contributions

This study intended to highlight the relevance of considering a specific emotion such as Anger in relation to Creativity. The idea behind studying a discrete emotion was to understand its particular effects on Creativity, and avoid the problems inherent in studying groups of moods. Problems such as trying to group emotion idiosyncrasy related to cognitive functioning and behavioural tendencies.

Using a longitudinal design to study the impact of Anger on Creativity in an organisational environment is not only relevant, but also runs contrary to the majority of studies, which use an experimental design.

The role of emotion regulation of Anger and its impact on Creativity is another contribution that has not hitherto been considered.

The study of Anger related to creativity by appraising CPE is also a contribution because it focuses on the process that leads to creative results.

To overcome some limitations of the present study there are several future research directions to consider. There is a need to broaden our Knowledge about the impact Anger has on CPE by studying other dimensions of Anger besides State Anger. It is relevant to study in greater depth the possible impact of Work Engagement as a moderator of Anger-Creativity.

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