When does negative mood boost creativity: A trait activation perspective

To, March Leung; Fisher, Cynthia

Published in:
West meets East: Enlightening, Balancing, and Transcending

Published: 01/01/2011

Document Version:
Peer reviewed version

WHEN DOES NEGATIVE MOOD BOOST CREATIVITY: A TRAIT ACTIVATION PERSPECTIVE

Abstract

Using a within-person approach, we investigated the boundary conditions under which activating negative mood may promote or inhibit concurrent creative process engagement (CPE). Drawing on trait activation theory, we propose that dispositional goal orientation (learning goal orientation and avoidance goal orientation) will be expressed in response to trait-relevant work contexts (job control and psychological punishment respectively), thereby moderating the effects of activating negative mood on CPE. As expected, activating negative mood was positively associated with CPE when learning goal orientation and job control were both high. Activating negative mood was negatively related to CPE when learning goal orientation was high but job control was low. Further, activating negative mood had a positive relationship with CPE when both avoidance goal orientation and psychological punishment were low. Our results suggest the important role of congruence between person and environment in producing mood-creativity relationships. Integrating the interactionist and cross-level approaches, our study contributes to untangling some of the complexity surrounding the associations between negative mood and creativity.

Keywords: creativity, mood, goal orientation, trait activation

WHEN DOES NEGATIVE MOOD BOOST CREATIVITY: A TRAIT ACTIVATION PERSPECTIVE

In line with recent creativity research (e.g., Hirst, Knippenberg, & Zhou, 2009; Zhang & Bartol, 2010a; 2010b), we focus on creativity as a process by which individuals generate novel and useful ideas or solutions to problems. The dependent variable in this study is creative process engagement (CPE), conceptualized by Zhang and Bartol (2010a) as including redefining and thinking about a problem, consulting information from different sources, and generating and evaluating alternatives. Research evidence has shown that engagement in creative processes predicts eventual creative outcomes (Amabile et al., 2005; Zhang & Bartol, 2010a; 2010b). Studying CPE behavior therefore provides a lever that may be useful in attempts to improve creative outcomes.

There is evidence that creativity and creative process engagement varies substantially within-person over short periods of time (Amabile et al., 2005; Bennewies & Wornlein, in press; To, Fisher et al., 2010). As individuals are not always at their creative best, we focus on understanding and predicting momentary choices to engage in more or less creative processes. Short term fluctuations in creativity are likely to be associated with equally short term causes. One potential cause that has generated a great deal of research is mood (see Baas et al., 2008 and Davis, 2009 for two recent meta-analyses). Much of the theorizing about the effects of mood on creativity has focused on the valence or hedonic tone of mood. There is meta-analytic evidence that positive mood leads to more creativity than neutral mood (Baas, et al., 2008; Davis, 2009). The findings for negative mood's role in creativity are less consistent and appear to be more situation specific (Davis, 2009; George, 2007; George & Zhou, 2002; 2007). Researchers such as Baas et al. (2008), De Dreu et al. (2008), and To, Fisher et al., (2010) have argued that mood valence alone does not explain creativity well. Instead, valence needs to be considered in concert with a second mood dimension—*activation*—to better

understand mood-creativity links. De Dreu et al.s (2008) have proposed and found support for the *dual pathway model* which explains the mechanisms by which both high activation positive and negative mood may enhance creativity. According to the dual pathway model (De Dreu et al., 2008), creativity can be achieved through a flexibility route, a persistence route, and some combination of the two. Positive mood facilitates the first path to creativity by enabling cognitive flexibility (Amabile et al., 2005; Isen 1999a; 1999b), while negative mood facilitates the second path by calling forth perseverance and prolonged effort toward generating innovative solutions to a problematic situation (George & Zhou, 2002; De Dreu et al., 2008). High rather than low activation moods provide the energy and enhance the cognitive capacity to enable creativity by either route (De Dreu et al., 2008; Seo Barrett, & Bartunek, 2004). Both laboratory and experience-sampling field evidence supported the idea that activating (not deactivating) positive mood promotes creativity (Baas et al., 2008; De Dreu et al., 2008; To, Fisher et al., 2010). However, the effects of activating negative mood on creativity are less straightforward because of its potential mixed influences on creativity (see Baas et al., 2008).

Scholars such as Davis (2009), George (2007), and George and Zhou (2002; 2007) have suggested that the effects of mood states, especially those negative in tone, on workplace creativity may be context-specific rather than universal. The interactionist perspective has suggested that contextual influences can interact with individual differences to foster or inhibit creativity (Shalley et al., 2009; Shalley et al., 2004; Woodman et al., 1993). Further, a small but growing research body on person-environment fit emphasizes the important roles of congruence between individual and environment in fostering creativity (e.g., Choi, 2004; Rala & Johns, 2010; Livingstone, 1997).

Drawing on Tett and colleagues' (e.g., Tett & Burnett, 2003; Tett & Guterman, 2000) *Trait Activation Theory*, we propose that mood-creativity links will be stronger when

individual differences (goal orientation) and work context (job control, psychological punishment) align to permit the energy supplied by negative activating mood to be directed toward creative efforts. Specifically, latent personality traits will manifest as trait-expressive behaviours only when trait-relevant cues are present (Tett & Burnett, 2003; Tett & Guterman, 2000). We propose that the mastery propensity associated with trait learning goal orientation will be expressed more strongly in response to a trait-relevant task context (high job control), thereby facilitating the individuals to benefit from activating negative mood promoting CPE (Bennewies & Wornlein, in press; De Dreu et al., 2008; Tett & Burnett, 2003). In contrast, the maladaptive response pattern associated with trait avoidance goal orientation is proposed to be more strongly expressed in response to trait-relevant social context (high psychological punishment). This trait activation may impede the otherwise facilitating effects of activating negative mood on CPE.

THEORY AND HYPOTHESES

Activating Mood and Creativity

De Dreu et al. (2008) proposed the *dual pathway model* to explain the mechanisms by which mood activation and mood valence jointly influence creativity. They hypothesized that creativity can be achieved in two ways, either "through enhanced cognitive flexibility, set-breaking, and cognitive restructuring, which manifests itself in the use of many broad and inclusive cognitive categories…[or] through enhanced persistence and perseverance, which manifests itself in a higher number of ideas and insights within a relatively low number of cognitive categories, prolonged effort and relatively long time-on-task" (p. 740). According to the dual pathway model, mood activation determines how likely creativity is to occur, and mood valence determines the routes by which creativity comes about. Activating positive mood promotes creativity by leading people to feel less constrained, to experience the situation as unproblematic, to think flexibly, and to act in a more generative way (De Dreu, et

al., 2008; George & Zhou 2007; Schwarz & Clore, 2003; Seo et al., 2004). Activating negative mood may also foster creativity, however, by sustaining hard work, perseverance, active coping, and prolonged effort toward producing in-depth, unusual, and original solutions (De Dreu et., 2008; Kauffmann, 2003; Seo et al., 2004). Creativity may be stimulated by recognition of a problem with the current situation and awareness of the need for change (Zhou & George, 2001). Negative moods inform people that the environment is problematic, thereby promoting a detail-oriented, analytic approach to understanding the nature of the problem, reduced reliance on pre-existing schemas or scripts, and greater effort to improve matters (George & Zhou, 2002; 2007; Schwarz & Clore, 2003). The idea of the dual pathway model received empirical support from four laboratory experiments (De Dreu et al., 2008). Drawing on the dual pathway model, To, Fisher, et al. (2010) conducted an experience-sampling study among post graduate students working on a long term project requiring creativity (writing their research theses). They found that naturally occurring positive and negative activating moods were both positively associated with CPE, whereas positive and negative deactivating moods were negatively associated with CPE.

Consistently, Baas et al.'s (2008) meta-analytic evidence supported that only activating positive mood, but not deactivating positive mood is associated with higher levels of creativity than neutral mood. Nevertheless, the question as to whether activating negative mood may promote or hinder creativity is relatively unclear (see Baas et al., 2008). Baas et al. (2008) find that activating negative mood such as anxiety is negatively related to creativity, albeit especially with respect to cognitive flexibility but not other creative components such as fluency and originality. Negative affect may lead to lowered ability to shift attention (Derryberry & Reed, 1998), reduced cognitive flexibility (Carnevale & Probst, 1998), and narrow cognitive categories (Milkulincer et al., 1990). Negative affect such as frustration,

anger or anxiety can also result in ruminative thoughts surrounding off-task activities that interferes task-focused attention (Beal, Weiss, Barross, & MacDermid, 2005).

In summary, recent research evidence tends to suggest that high arousal moods are more effective than low arousal moods in fostering creativity (Bennewies & Wornlein, in press; Dreu et al., 2008; To, Fisher, et al., 2010b). Nevertheless, the effects of negative activating mood on creativity tend to be less straightforward than those of positive activating mood. If the energy provided by negative moods is translated into on-task coping, activating negative mood may facilitate creativity through increased cognitive persistence and prolonged, effortful, and analytical probing of alternatives (Baas et al., 2008; De Dreu et al., 2008). But does this always happen? Less functional responses to negative mood are also possible, so it is important to identify boundary conditions for activating negative mood fostering creativity (Davis, 2009; George, 2007[CF1]).

Mood and Trait Activation, and CPE

Drawing on the dual pathway model and trait activation theory (Tett & Burnett, 2003; Tett & Guterman, 2000), we hypothesize conditions under which activating negative moods will facilitate or inhibit creative process engagement. Specifically, we argue that job control and psychological punishment are the two trait-relevant contexts that may 'turn on and off' trait learning goal orientation and avoidance goal orientation, respectively. This may in turn moderate the effects of activating negative mood on creative behavior.

Goal orientation constructs are divided into approach and avoidance orientations. Approach goal orientation is further divided into two types (Dweck & Leggett, 1988; Elliot, 2008; Elliot & Dweck, 1988). The first of these is *learning goal orientation*, which involves working to develop competence through expanding one's abilities by mastering challenging situations. The other is *performance-prove goal orientation*, which involves working to validate competence by seeking favorable judgments from others (VandeWalle, 1997). We

focus on learning goal orientation as the most distinct form of approach motivation in the present study of creativity. We also focus on *avoidance goal orientation*, which is a preoccupation with avoiding negative judgments from others or the display of incompetence (VandeWalle, 1997).

Goal orientation research has suggested that dispositional goal orientation explains individual differences in creativity (Gong et al., 2009; Hirst et al., 2009; Janssen & VanYperen, 2004), with which learning goal orientation facilitates creativity (Gong et al., 2009; Hirst et al., 2009) but avoidance goal orientation might be more likely to lead people to shy away from attempts to be creative when facing obstacles (Hirst et al., 2009). Nevertheless, the question of whether goal orientation expresses itself in consistent patterns of functioning across contexts remains unclear (see DeShon & Gillespie, 2005; Payne, Youngcourt, & Beaubien , 2007 for reviews). Trait goal orientation may predispose individuals to adopt certain response patterns, but contextual characteristics may override or lessen these predispositions (Button, Mathieu, Zajac, 1996).

Trait learning goal orientation and job control

Dispositional goal orientation research confirms that trait learning goal orientation has a main effect on creativity (Hirst, et al., 2009; Gong et al., 2009; cf. Janssen & Van Yperen, 2004). Learning goal orientation focuses attention on developing competence by acquiring new knowledge and skills and directs attention to the value of the activity itself (Elliot & Harackiewicz, 1994; Harackiewicz, Barron, Tauer, & Elliot, 2002; Pekrun, Elliot, & Maier, 2006). Individuals high on learning goal orientation believe that competence is malleable, and effort is a determinant of success (Dweck & Leggett, 1988; VandeWalle, 1997). They tend to persist in the face of obstacles, view negative feedback as useful information for improvement, and desire to work on challenging tasks (e.g., Button, Mathieu, & Zajac, 1996; Cron, Slocum, VandeWalle, & Fu, 2005; VandeWalle, 1997). Creativity often requires the

development and generation of something new for which the requisite task activities have yet to be mastered (Hirst, et al., 2009; Janssen &Van Yperen, 2004). Efforts to develop new and useful solutions may expose individuals to difficult tasks, setbacks, or failures. In this case, a strong learning goal orientation can assist in coping with the challenges and obstacles of creative process engagement in an effective way. Moreover, learning goal orientation focuses attention on the elaboration and development of new knowledge and deep processing strategies leading to effectiveness in complex and unfamiliar tasks (Janssen &Van Yperen, 2004; Steele-Johnson et al., 2000). In sum, the mastery propensity residing in trait learning goal orientation can facilitate the adoption of favorable patterns in response to opportunities to be creative. However, while trait goal orientation predisposes individuals to adopt certain response patterns, contextual factors may cause them to adopt a different or less characteristic response pattern (e.g., Button et al., 1996; Payne, 2007).

Rooted in the *person-environment fit* perspective, Tett and his colleagues' Trait Activation Theory holds that latent personality traits will manifest as trait-expressive behaviours when the trait-relevant situations are present in working settings (Tett & Burnett, 2003; Tett & Guterman, 2000). Trait activation theory builds on the basic personality-based assumption that traits represent between-person uniquenesses directing behaviours and performance, but emphasizes the moderating roles of situational features in the relationships (Tett & Burnett, 2003). Tett and Guterman (2000) argue that traits are latent potential residing in the person, and relevant situational cues can trigger trait expressions (i.e., behaviors) leading to performance. Trait-relevant cues can stem from different sources such as the job itself, social norms or practices, and/or the organisational context (Tett & Burnett, 2003). Employees gain intrinsic rewards through trait expression per se as expressing one's personality is inherently desirable (Tett & Burnett, 2003). Learning goal orientation focuses attention on ongoing mastery of activity, controllability of competency development through

effort, and the positive value of the activity itself (Pekrun, Elliot, & Maier, 2006). Drawing on trait activation theory, we propose that learning goal orientation is likely to be expressed in response to the cues that the job permits such discretion and control.

The specific construct of interest is general job control. Researchers have conceptualized and operationalized control at work as two closely related concepts: *autonomy* and *impact* (Brockner et al., 2004; Greenberger & Strasser, 1986; Tangirala and Ramanujam, 2008). Autonomy refers to the individual's sense of choice or independence about job activities, and impact refers to the individual's perception that important outcomes are contingent upon own his/her behaviours or efforts (Spreitzer, 1995). Control is high when people believe that they have discretion over their job activities and influence over important outcomes, whereas control is low when employees believe that they have limited independence in choosing their work behaviours and fail to see a contingency between such behaviours and important outcomes (Brockner et al., 2004; Tangirala & Ramanujam, 2008). Job control has been found to influence different forms of proactive behaviours (e.g., Axtell, Holman, Unsworth, Wall, & Waterson, 2000; Frese et al., 1996; Ohly et al., 2006; Parker et al., 2006). Ohly and Fritz's (2010) recent experience-sampling evidence indicates that general job control facilitates daily creativity. The authors reason that people who have control over job activities react more effectively to feelings of activation by showing initiative (Ohly & Fritz, 2010). Also, job control is associated with felt responsibility and ownership, and exertion of control is intrinsically satisfying (Parker et al., 2006; Ryan & Deci, 2000). Further, a sense of having control can lead to appraisal of a situation as challenge rather than a threat that focus attention on potential gain instead of loss (Lazarus & Folkman, 1984). Bennewies and Wornlein (in press) propose that high job control may help employees capitalize on activating moods conducive to creativity.

We propose that job control facilitates expression of trait learning goal for three reasons. First, learning goal oriented people believe ability is malleable, and effort is a determinant of success (Dweck & Leggett, 1988; Vande Walle, 1997). Job control reflects a belief that outcomes are contingent upon rather than independent of one's effort, which is likely to align with and turn on the mastery propensity (Brockner et al., 2004; Dweck & Leggett, 1988; Tangirala & Ramanujam, 2008; Tett & Burnett, 2003). Second, the felt ownership and freedom associated with high control are congruent with the inclination of learning goal oriented individuals to seek out mastery for its own sake (Brockner et al., 2004; Janssen & VanYperen, 2004; Hirst et al., 2009; Parker et al., 2006). High learning goal orientation individuals are expected to be more intrinsically rewarded when having and exerting job control. Third, a sense of independence and autonomy about work activities may release employees from evaluation pressure or interpersonal interference, thereby allowing potentially risky efforts to be creative (e.g., see George 2007; Pedersen, 1997; Zhou, 2003). We argue that having control is likely to bring out the mastery predisposition of learning-oriented people due to a perceived person-context fit, and this is likely to result in higher engagement in creative processes. In contrast, in the absence of trait-relevant cues (low job control), the creative propensity of high learning goal orientation individuals is unlikely to be expressed. Thus we hypothesize:

> *Hypothesis 1*: General job control will moderate the relationship between trait learning goal orientation and creative process engagement. Specifically, learning goal orientation will have a stronger association with CPE when control is high than when control is low. [CF2]

Activating negative mood, goal orientation, and job control

Negative mood is a source of energy for creative behavior. Activating negative mood can promote creativity through reduced reliance on pre-existing assumptions and enhanced perseverance toward producing creative solutions to improve a situation (De Dreu et al., 2008; To, Fisher et al., 2010). However, the facilitating effect of negative mood may not be uniform across individuals. The implications of the information provided by mood may not be universal but are interpreted relative to the goals or objectives sought by the individual (Martin et al. 1993; To, et al., 2010). Negative moods signal a lack of progress toward goals, and such feedback may inform a learning goal oriented individual that additional effort and skill development are needed (Cron et al., 2005; VandeWalle, Cron, & Slocum, 2001; To et al., 2010). Therefore, activating negative mood within a high learning goal orientation may call for attempts to develop new competence or skills for problem-solving (To et al., 2010). In sum, for a high learning goal orientation individual, an activating negative mood may trigger greater efforts toward CPE, provided her or his mastery propensity is activated by a high job control context.

As hypothesized above, job control helps to activate the mastery trait of learning-oriented individuals. For a learning-oriented employee in a high job control setting, the problem signal flowing from activating negative mood may call for engagement in creative process to foster mastery (To et al., 2010). High job control also provides employees with more freedom and opportunities to develop and elaborate on creative ideas (Ohly et al., 2006; Ohly & Fritz, 2010), and thereby enables employees to take advantage of their activating negative mood for creative striving (Bennewies & Wornlein, in press). Consequently, learning-oriented individuals experiencing high arousal negative mood may stay focused, persist, and try out new coping alternatives in a more adaptive way. Activating negative mood may thus serve to promote CPE when learning goal orientation and job control are both high.

In contrast, low job control that is incongruent to trait expression of learning goal orientation may impede or reverse the facilitating role of activating negative mood in CPE. Bennewies and Wornlein's (in press) experience-sampling evidence shows that activating negative mood is negatively related to daily creativity when job control is low because the context constrains employees in capitalizing from activating negative mood promoting creativity. We argue that this restriction would be more detrimental to high learning-oriented individuals. Recent research on person-environment fit has pointed out the potential negative influence of incompatibility between person and environment on creativity (Choi, 2004; De Dreu, Nijstad, & Baas, in press; Raja & Johns, 2010). For example, De Dreu et al.'s (in press) laboratory evidence offers initial evidence showing that creativity can be inhibited when approach-oriented people experience poor fit between their natural inclinations and situational affordances (see also Higgins, Idson, Freitas, Spiegel & Molden, 2003). In pursuit of mastery for its own sake, high learning goal people are expected to prefer high autonomy and control at work. Low job control reflects a sense of limited independence, low internal locus of control as well as weak ownership (e.g., Brockner et al., 2004; Ohly & Fritz, 2010), which seems to be contradictory to a mastery inclination. Further, activating negative mood in the presence of low control might be more likely to result in threat instead of challenge appraisal, priming a prevention focus that may reduce creative efforts (cf. Baas et al., 2008). Taken together, negative mood when job control is low is more likely to offer cues incongruent to a learning orientation. Negative affective experience might become interfering to task-focused attentional resource (Beal et al. 2005). As a result, CPE which often entails more complex and demanding cognitive functioning may be inhibited.

In sum, we propose a three way interaction of job control, learning goal orientation and activating negative mood in explaining CPE. High job control facilitates high learning-oriented people to express their mastery trait by turning the energy provided by activating

negative mood into creative processes (Bennewies & Wornlein, 2010; Ohly & Fritz, 2010; Tett & Burnett, 2003). In contrast, low job control may conflict with and restrain the expression of trait learning goal orientation, thereby reducing the creative efforts that would otherwise be triggered by activating negative mood. Thus:

> *Hypothesis 2:* There will be a three-way interaction between activating negative mood, learning goal orientation, and job control in explaining CPE. Specifically, activating negative mood will be positively associated with CPE when both learning orientation and control for creativity are high. Activating negative mood will be negatively related to CPE when learning goal orientation is high but job control is low.

Trait avoid goal orientation and psychological punishment

Trait avoidance goal orientation focuses on avoiding negative judgments from others, which implies a tendency to avoid challenges that carry the risk of mistakes (Hirst et al., 2008; VandeWalle, 1997). High avoid goal individuals are more likely to withdraw after encountering setbacks and negative feedback (Barron & Harackiewicz, 2000; Elliot, 1999). Engagement in attempts to be creative exposes individuals to the possibility of failures and errors, which is likely to be perceived as a warning of low ability by those high on avoidance goal orientation. Organizational research on trait avoidance goal orientation and creativity is largely lacking (see Hirst et al. for an exception). Hirst et al. (2009) did not propose any main effect of trait avoidance goal orientation on creativity. Rather, the authors hypothesize that high avoidance oriented people will be more likely to shy away from creativity only when a team context does little to encourage learning, because the psychological risks associated with the activities will be higher. This proposed two-way interaction was not supported (Hirst et al., 2009).

According to trait activation theory, traits can also be activated by social cues that arise in working with others. We propose that a context cuing on high psychological punishment is relevant for the activation of avoidance goal orientation. Psychological punishment is defined as a felt or anticipated interpersonal penalty inflicted for deviant behaviors against existing social standards or practices. The penalty does not necessarily involve physical sanction, but psychological threat such as embarrassment or rejection by others due to deviance. This construct has roots in early research on psychological safety which reflects the extent to which people feel secure for interpersonal risk taking in a work unit (Edmonson, 1999; see also Schein & Bennis, 1966). Psychological punishment is not the opposite of psychological safety. The two variables differ in that psychological safety involves a broader sense of interpersonal concerns; for example, whether people feel safe speaking up on tough issues or asking help from others (Edmonson, 1999). Psychological punishment primarily reflects fear of faulty actions at work due to likely adverse reactions from others.

We propose that the belief that the work environment is potentially psychologically punishing will activate trait avoidance goal orientation. This will reinforce avoidance-oriented people's concern about negative reactions or judgments that have the potential for embarrassment, rejection, or threat to self-esteem. To avoid looking bad, these individuals may play it safe by avoiding the risk inherent in creative attempts (Hirst et al., 2009). In contrast, a low psychological punishment context may signal that risk-taking is safer, learning from mistakes is not shameful, and mistakes will not be held against one. These signals may alleviate the prevention tendency of high avoidance-oriented people. This is likely to reduce the perceived risks of creative efforts and attenuate the negative impact of trait avoidance goal orientation on CPE (Hirst et al., 2009). Therefore, we propose that:

Hypothesis 3: Psychological punishment will moderate the relationship between avoidance goal orientation and creative process engagement. Specifically, avoidance goal orientation will be negatively related to CPE only when psychological punishment is high.

Activating negative mood, avoidance goal orientation and psychological punishment

We propose that experiencing high arousal negative mood will prevent high avoidance goal oriented people from engaging in creative process when psychological punishment is high. As hypothesized, a context cueing high psychological punishment is likely to turn on the avoidance trait. High avoidance oriented individuals are likely to experience intensified negative affect following negative feedback (Cron et al., 2005). They may suffer more from off-task ruminative thoughts surrounding negative affective experiences, which may distract on-task attentional resources (Beal et al., 2005). Negative moods can lead them towards pessimistic evaluations about how likely it is that their effort can achieve success (Seo et al., 2005). They thus tend to have a higher tendency to pursue a maladaptive response pattern of effort disengagement (Van de Walle, Cron, & Slocum, 2001). This may be particularly detrimental to CPE that often entails more risky, unfamiliar, or mood-threatening task activities. In sum, negative moods are more likely to lead avoidance goal orientation people to shy away from attempts to be creative (To et al., 2010).

In contrast, activating negative mood is likely to facilitate CPE when avoidance goal orientation and psychological punishment are both low. A social context cueing low punishment may allay concerns about negative judgments from others. Low avoidance goal people are also less vulnerable to negative feedback and setbacks. Without the intrusion of evaluation pressure that accompanies the avoidance trait in a punitive environment, the energy

flowing from high arousal negative moods may motivate persistent task-focused effort toward creativity.

In sum, we propose a three-way interaction of psychological punishment, avoidance goal orientation, and activating negative mood in explaining CPE. Activating negative mood may facilitate prolonged effort toward engagement in creative process for on-task coping when avoidance goal orientation and psychological punishment are both low. However, strong cues about punishment turn on the prevention propensity of high avoidance goal individuals, thereby impeding the otherwise facilitating effect of activating negative mood on CPE. Therefore:

> *Hypothesis 4:* There will be a three-way interaction between activating negative mood, avoidance goal orientation, and psychological punishment in explaining CPE. Specifically, activating negative mood will be negatively related CPE when avoidance orientation and punishment are both high. Activating negative mood will be positively related CPE when avoidance orientation and punishment are both high.

Method

Participants and Procedure

A total of 559 momentary reports were collected from sixty-eight employees from R&D/advertising organizations in Australia. The participants held jobs dealing with research activities (42%), administrative or communications and coordination work (30.4%), and other areas such as graphic designers and software developer (27.6%). This wider occupation coverage increased the generalizability of the findings. Thirty percent of the participants were male. The participants had an average age of 36.56 years (SD = 10.69) and an average tenure of 4.51 years (SD = 5.06). Most of the participants held a bachelor's degree (43.5%).

Participants were asked to complete a one-time on-line survey assessing the Level-2 variables of goal orientations, and psychological punishment, and job control. They subsequently received emailed links to an on-line questionnaire two times (morning and afternoon) per day for five working days, on which they reported the Level-1 variables of current moods, CPE and intrinsic motivation. Participation in the study was voluntary, and each of the participants received a gift voucher ($40) as an incentive. The overall response rate to the twice daily surveys was 82%. The mean number of responses per participant was 8.15 out of a possible 10 (SD = 1.05). The most commonly adopted approach to assess creative outcomes involves observer-rated assessments, in which supervisors or peers make scale-rated assessments of the participants' creative job performance (e.g., Amabile et al., 2005; George & Zhou, 2007; Zhou & George, 2001). We obtained observer-rated creative performance in order to examine the predictive validity of CPE in our sample. Respondents nominated the superior or peer best positioned to have observed their recent creative performance. Observers completed an online questionnaire to assessing their participant's recent creativity, shortly after the conclusion of the experience sampling period. Thirty two observers responded.

Measures

Creative process engagement. Creative process engagement was assessed with six items from Zhang and Bartol (2010a; 2010b). Zhang and Bartol (2010a) validated a 11-item CPE measure with three dimensions, namely problem identification, information processing, and idea/alternative generation. To reduce participant response burden yet assure construct validity, we selected two items from each the three dimensions that would logically be expected to vary over the short term. Creative process engagement (reliability averaged over measurements = .93) was measured on a 5-point Likert scale, ranging from 1 (not at all) to 5 (very much). The items were slightly modified and phrased with half-day time instruction

(e.g., “This morning/afternoon…I tried to devise potential solutions that move away from established ways” and “…I spent considerable time sifting through information to generate new ideas of doing things”). Experience-sampling studies often use shortened version of existing scales. To confirm the effectiveness of using these six items to operationalize CPE, we subsequently conduct a single administration of an online survey, in which participants completed the full 11 item version, with the referent “your behaviour over the past few months”. The correlation between the 6 item version and the 11 item version in this administration was .95 ($p < .01$), demonstrating that the six items effectively assessed the same construct as the full scale.

CPE is not intended to be the same as creative outcomes, but has been found to predict creative performance (Zhang & Barton, 2010a; 2010b). We confirmed the utility of measuring CPE in this study by assessing its correlation with observer ratings of overall creativity. Observers assessed participants’ recent creative performance with Zhou and George’s (2001) 13-item creativity scale[CF3]. The correlation between weekly average self-rated CPE and observer rated creative performance was .34 ($p <.05$, $n = 32$ pairs). Given that these results are based on different measures, different time frames, and different sources, this correlation provides evidence of the predictive validity of the 6-item measure of CPE.

Activating mood. We adapted items from De Dreu et al. (2008) to measure activating negative mood using a 5-point scale, ranging from 1 (not at all/very slightly) to 5 (very much). The five adjectives measuring activating negative mood were “upset”, “frustrated”, “anxious”, “ashamed” and “angry” (reliability averaged over measurements = .78). We also measured activating positive mood as a control variable. The five adjectives measuring activating positive mood were “excited”, “enthusiastic”, “elated”, “inspired”, and “proud” (reliability averaged over measurements = .88). The items were phrased with half-day (morning and afternoon) time instructions.

Trait learning goal orientation. Learning goal orientation was measured with four items[CF4] from VandeWalle (1997) on a 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree) (reliability =.74). Item samples were: "I am willing to select a challenging task that I can learn a lot from"; "I enjoy challenging and difficult tasks at work where I'll learn new skills"

Job control. Following Brockner et al., (2004) and Tangirala and Ramanujam, (2008), we used the six items from the autonomy and impact subscales of Spreitzer's (1995) empowerment scale to measure perceived job control (reliability =.90) on a 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Samples items were: "I have considerable opportunity for independence and freedom in how I do my job"; "I have significant autonomy in determining how I do my job"; "I have a great deal of control over what happens in my work" and "I have significant influence over what happens in my work". We examined the factor structure of learning goal orientation and job control by comparing a two-factor model (the two variables loaded on two factors) with a one-factor model (the two variables loaded on a single factor). Results confirmed that the two-factor model (χ^2 = 53.6, *df* = 34; *RMSEA* = .087; *CFI* = .93 and *IFI* = .94) fit the data better than the one-factor (χ^2 = 96.8, *df* =;35, *RMSEA* = .152; *CFI* = .78 and *IFI* = .80) with significant Chi-square change ($\Delta\chi^2$ = 43.2; Δdf = 1, p <.01).

Trait avoidance goal orientation Avoidance goal orientation was measured with four items from VandeWalle (1997) on a 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree) (reliability = .84). Item samples were: "I prefer to avoid situations at work where I can perform poorly"; "Avoiding a show of low ability is more important to me than learning a new task".

Psychological punishment. Psychological punishment was measured with 5 items adapted from Calantone et al. (2002) and Edmonson (1999) on a 5-point scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Samples items were: "If I make a mistake here, it will be held against me"; "People in my work unit sometimes reject people for thinking outside the box"; "It is safe to take a risk here (reversed item)"; and "The sense around here is that attempt failures or mistakes are valuable, not shameful (reversed item)" (reliability = .84). We examined the factor structure of avoidance goal orientation and psychological punishment by comparing a two-factor model (the two variables loaded on two factors) with a one-factor model (the two variables loaded on a single factor). Results confirmed that the two-factor model (χ^2 = 35.7, *df* = 26; *RMSEA* = .070; *CFI* = .96 and *IFI* = .96) fit the data better than the one-factor model (χ^2 = 132.6, *df* = 27; *RMSEA* = .227; *CFI* = .58 and *IFI* = .60) with significant Chi-square change ($\Delta\chi^2$ = 96.9; Δdf = 1, p <.01).

Control variable. We included a measure of momentary intrinsic motivation as a control variable, which was assessed with two items adapted from Eisenberger and Rhoades (2001)'s scale. Intrinsic motivation has been regarded as a key factor related to creativity (e.g., Amabile et al.,1994; Eissenberger & Rhoades, 2001). The two items were phrased with half-day time (i.e., "This morning/afternoon…I enjoyed the work I did" and "I was interested in my work") using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) (reliability averaged over measurements = .87[CF5]).

Results

Hierarchical linear modeling (HLM; Byrk & Raudenbush, 1992) was used to test all hypotheses. To examine within-person relationships between mood and CPE (level 1), CPE was regressed on momentary moods. At Level 2, the parameters estimated at level 1 (intercepts and slopes) were regressed on between-person variables (goal orientation constructs, contextual variables, and their cross-products).

In HLM analyses, time-series data violate the assumption of residual independence at level 1 (Hofmann, Griffin & Gavin, 2000), so it was necessary to account for serial dependence (residual autocorrelation) that may be present in the level 1 data. To accomplish this, lagged creative process engagement (Time t-1) was included as a control for all analyses (Ilies & Judge, 2002; Judge & Ilies, 2004). To form the lagged variable, momentary CPE was lagged by one survey period. The scores were not lagged across missing reports. The scores of level 1 variables were centered relative to each respondent's average score to eliminate between-individual variance. Therefore, the estimates represent strictly within-person associations (Ilies, Scott & Judge, 2006). All level 2 variables were grand centered. To control for possible time trends in CPE, a time index variable was also included (Judge & Ilies, 2004). This variable was coded according to the day and time of each measurement. Table 1 shows the means, standard deviations, correlations, and reliabilities for all study variables.

Before testing the hypotheses, we estimated the within- and between-person variance components from the null hierarchical linear model for all level 1 variables. The percentage of total variance that was within-person for CPE was 53%; for activating negative moods was 66%; for activating positive mood was 46%; and for intrinsic motivation it was 55%. These figures are within the range of percentages of within-person variance found in other ESM studies (Dala, Lam, Weiss, & Welch, 2009; Fisher & Nobel, 2004; Seo et al., 2010).

Activating Negative Mood, Learning Goal, and Control

Hypothesis 1 proposed a two-way interaction of learning goal orientation and job control (Level-2) in explaining CPE (Level-1). Hypothesis 2 proposed a three-way cross-level interaction of learning goal orientation, job control, and activating negative mood in explaining CPE. As can be seen in Table 2 (Model 1), the hypothesized two-way interaction term and three-way interaction term were both significant with control variables entered, in support of both Hypothesis 1 and 2. In addition, although it was not hypothesized, the

interaction term of job control and activating negative mood was also significant, which is consistent with Bennewies and Wornlein's (in press) experience-sampling findings. Probing[m6] results show that activating negative mood was positively (negatively) related to CPE when job control was high (low). We examine the results of the hypothesized three-way interaction, because support for it renders the interpretation of the main effect and the two-way interaction results incomplete[CF7]. Figure 1 graphically illustrates the interactive effects. Probing results showed that activating negative mood was positively associated with CPE when learning goal orientation and job control were both high at + *1 SD* ($p<.01$), and that activating negative mood was negatively associated with CPE when learning goal orientation was high at + 1 *SD* and job control was low at - *1 SD* ($p <.1$).

Activating Negative Mood, Avoidance Goal, and Punishment

Hypothesis 3 proposed a two-way interaction of avoidance goal orientation and psychological punishment in explaining CPE. Hypothesis 4 proposed a three-way cross-level interaction of avoidance goal orientation, psychological punishment, and activating negative mood in explaining CPE. Table 2 (Model 2) shows that the two-way interaction term was not significant but the three-way interaction term was significant. Hypothesis 3 was not supported. We further investigated the three-way interaction. As expected, activating negative mood was positively associated with CPE when avoidance goal orientation and punishment were both low at - *1 SD* ($p <.01$). However, the relationship between activating negative mood and CPE was not significant when avoidance goal orientation and punishment were both high. Hypothesis 4 was partially supported. The three-way interaction of avoidance goal orientation, psychological punishment, and activating negative mood is graphically illustrated by Figure 2.

Discussion

Our study yielded several findings that advance understanding of the relationships between activating negative mood and creativity at work. First, we hypothesize and find that individuals high on learning goal orientation are more effective in channeling activating negative mood into CPE only when job control is high. Second, we hypothesize and find that when job control is low, activating negative mood is negatively related to reduces CPE for high learning goal oriented individuals. Third, we provided evidence that activating negative mood is positively related to CPE when avoidance goal orientation and psychological punishment are both low. Overall, this study responds and contributes to work by Baas et al. (2008), Davis (2009), and George and Zhou (2002; 2007), who suggested the importance of investigating boundary conditions under which negative moods influence creativity at work. We discuss our findings and implications in more detail below.

The roles played by negatively valent mood activation in creativity are relatively more complicated than those played by positive mood, and previous research evidence provided seemingly mixed findings on the effects of activating negative mood on creativity (see Baas et al., 2008; Bennewies & Wornlein, in press; To Fisher, et al., 2010). Organizational scholars such as George (2007); George and Zhou (2002; 2007) have suggested that the effects of mood states (especially negative moods) on creativity may not be always positive or negative, but may be sensitive to context. In line with this view, our findings suggest that whether activating negative mood may promote or hinder creative process engagement could depend on compatibility between person and environment.

Specifically, we hypothesized and found that activating negative mood was positively related to CPE when learning goal orientation and job control were both high. Similar to our findings, recent experience-sampling evidence shows that general job control is positively related to daily creativity (Ohly & Fritz, 2010). Job control has also been proposed to enable employees experiencing activating negative mood to be more creative (Bennewies and

Wornlein, in press). Based on trait activation theory (Tett & Burnett, 2003), our findings suggest further that a sense of having high job control can trigger expression of the mastery propensity residing in learning-oriented employees. For an 'activated' learning goal oriented individual, the problematic signal flowing from a high arousal negative mood may cue a sense of challenge, engendering greater effort toward CPE to foster mastery (Baas et al., 2008; De Dreu et al., 2008; Lazarus & Folkman, 1984, To Ashkanasy et al., 2010). Low learning goal individuals, however, may benefit less from activating negative mood because there is little mastery propensity to be triggered by job control.

Further, we provided evidence that activating negative mood when learning goal orientation is high but job control is low is negatively related to CPE. This is consistent with Bennewies and Wornlein (in press) who find a negative moderating effect of job control on the relationship between activating negative mood and creativity. Our evidence suggests that this negative influence of low control seems to be particularly detrimental to high learning-oriented individuals. An explanation is that activating negative mood flowing from a low control context may offer contradictory cues that override or suppress trait learning goal orientation (Button et al., 1996; Tett & Burnett, 2003). When people engage in goal pursuit behaviors in a manner that unfits their orientation, they do not 'feel right' about their task engagement (Higgins, 2000; Higgins et al., 2003). Such unfit experience could be detrimental to approach-orientated people's creativity (De Dreu et al., in press). Overall, our findings suggest that activating negative mood is more likely to promote CPE for learning-oriented individuals when their mastery propensity is expressed in response to high job control. Low control, in contrast, tends to 'shut it down', and this deactivation of learning goal orientation tends to make high arousal negative mood inhibitive to CPE.

Our results also indicated that activating negative mood is positively related to CPE when avoidance goal orientation and psychological punishment are both low. The facilitating

effect of high arousal negative mood, however, is substantially impeded when either avoidance goal orientation or psychological punishment are high. Activating negative mood can promote creativity through prolonged cognitive effort toward producing a creative solution to a problem (De Dreu et al., 2008), provided attentional resources are focused on on-task coping. People experiencing an activating negative mood might instead ruminate about off-task activities, which in turn interferes with task-focused attention and creativity (Beal et al., 2005). The concern about social judgment associated with high avoidance goal orientation or psychological punishment may engender more off-task ruminative thoughts. Experiencing negative moods such as frustration, anger or anxiety may therefore interrupt the cognitive activities necessary for CPE. In contrast, activating negative mood may serve as as effective facilitator of creative process engagement when concern about the scrutiny associated with the avoidance trait and punishing context are both low.

Our study offers implications for future research. Both mood and creativity can fluctuate within-person across short time period. Research using a within-person approach to investigate the mood-creativity links is surprisingly sparse (see Amabile et al., 2005; and Bennewies & Wornlein, in press for rare exceptions). We find that fifty-three percent of the variance of current creative process engagement was within-person. In line with the two prior experience-sampling studies by Amabile et al. (2005) and Bennewies and Wornlein (in press), our study suggests that a within-person approach to creativity is warranted in work settings. More research with repeated measure is needed to investigate how creative behavior can be explained by transient states. For example, transient flow state is one of the promising variables (see Fisher, 2010 for a review). Flow states may occur when individuals are working on tasks that are above their own average on both challenge and skill requirements. One of the features of flow experiences is that people are “stretching his or her capabilities with the likelihood of learning new skills and increasing self-esteem and personal complexity’

(Csikszentmihalyi and LeFevre 1989, 816). Flow experiences are reasonably associated with a sense of deep task engagement that might foster concurrent and subsequent CPE over time. Future time-sampling research may investigate how work contexts may promote momentary creativity through facilitating flow experiences.

The person X situation interaction perspective also opens new research avenues for research on mood and creativity. For example, trait activation of another approach orientation, i.e., performance-prove goal orientation goal, may also have implications for mood-creativity links. Workers gain extrinsic reward when their trait expressions are recognized and valued positively by peers and/or supervisors (Tett & Burnett, 2003). High performance-prove goal oriented people are sensitive to social cues to determine which behavior is appropriate to demonstrate for obtaining extrinsic recognition and outperforming others (Hirst et al., 2008). In this regard, strong social signals cuing creative job performance such as competitive climate for creativity is likely to turn on their 'achievement-by-winning' propensity and manifests as pursuit of creativity. Activated prove goal individuals may effectively use activating moods as resources to foster creative efforts. Future researchers may wish to investigate how different traits may interact with other contextual variables to moderate the effects of mood activation on creativity. Understanding that creative behavior fluctuates within-person, and how individual and contextual factors may align to influence these fluctuations, may provide levers for improving creative outcomes.

Implications for practice

Our study offers implications for managerial practices. Managers or project leaders should be aware that activating moods, especially those negative in tone, may not be always be conducive to creativity. Promoting trait-context congruence may matter for creativity. Generally speaking, creativity seems fit better with individuals high on learning goal orientation than avoidance goal orientation. The mastery inclination of learning-oriented

individuals may help them respond adaptively to activating negative mood by being creative. However, this desirable trait-expressive behavior may only occur when the work environment offer cues congruent to their learning propensity. Job control seems to be such a cue. Managers should bear in mind that learning goal oriented individuals seek out mastery and creativity for their own sake. These individuals pursue a task-focused, autonomous work environment where they can make influence on their own jobs. To promote their creativity (especially when experiencing activating negative moods), managers should give them a sense of work control. Lack of control that is incongruent to their master trait may inhibit their creative striving, especially during high arousal negative moods. Further, managers who wish to promote creativity in their workplace should also encourage a non-punishing work environment for low avoidance goal individuals. These individuals generally do not focus attention on avoiding mistakes or negative judgment from others, and may fit in a work environment cueing low felt penalty. This trait-context fit may liberate the energy flowing from activating negative mood to be used for creativity.

Limitations

This study is not without limitations. As will be explained below, however, these limitations do not prevent the study from making a contribution to the literature.

Self-report. The nature of experience sampling research virtually dictates the use of self-report measures. In our particular case, there were no external sources that could consistently monitor and assess creative behavior on a short-term basis, and no external source could report on moods. Self-report variables may raise concerns about common method bias, although some have suggested that repeated-measure research involving within-person analyses are less subject to this problem (Foo, Uy, and Barson, 2009; Williams & Alliger,1994). Some concerns applicable to self-report measures in between-person studies were dealt with by the experience sampling design and analyses. First, since each variable in

the within-person analyses was centered at each individual's mean, many of the usual problems with self-reported data such as personality confounds or response-set tendencies are eliminated (Judge & Ilies, 2004; Scott & Judge, 2006). Second, for some analyses the predictor and criterion were collected at different times, thus reducing the potential for common method bias (Podsakoff, Mackenzie, Lee, & Podsakoff, 2003). For example, participants reported the criterion variable (CPE) and level 2 variables (goal orientation, job control and psychological punishment) in different questionnaires at different times. Third, exploratory factor analysis of the five level-1 variables yielded five factors (not just one), and a single factor did not account for most of the variance. Common method variance is unlikely to be a serious problem in this study (Podsakoff et al., 2003). Fourth, self-ratings of mood and of very recent behavior such as CPE are likely to be accurate because participants did not need to use the error-prone process of recalling many past experiences and integrating across time to construct a response. Instead, they would simply access immediate experience to produce accurate reports with minimal processing errors (Robinson & Clore, 2002). Fifth, the moderate correlation between self-reported CPE and other-rated creative performance based on different measures, different time frames, and different sources provides evidence of the predictive validity of CPE.

Causality. The correlational nature of the ESM design means that definitive conclusions that mood causes creativity cannot be drawn. Amabile et al. (2005) have suggested that some reciprocal causation between mood and creativity is possible. Nevertheless, decades of laboratory research with manipulated mood, together with evidence for an underlying physiological process by which activation enables creativity, add weight to the idea that mood can be causally related to CPE.

In conclusion, the present study contributes to the literature on mood and creativity by exploring how the interaction of trait goal orientation and context formulate boundary

conditions for relationships between activating negative mood and creativity. Integrating the interactionist and cross-level approaches, our study contributes to resolving some of the controversy surrounding the mood-creativity relationships.

TABLE 1
Descriptive Statistics (between-persons)

	Mean	SD	1	2	3	4	5	6	7	8
1. Creative Process Engagement	2.59	1.04	(.93)	.29**	.26**	-.02				
2. Intrinsic Motivation	3.54	.87	.29*	(.87)	.52**	-.26**				
3. Activating Positive Mood	2.18	.91	.42**	.42**	(.88)	-.31**				
4. Activating Negative Mood	1.52	.66	.04	-.41**	-.09	(.78)				
5. Learning Goal Orientation	4.18	.54	.32**	.19	.25*	-.02	(.74)			
6. Avoidance Goal Orientation	2.57	.81	-.14	-.19	.02	.07	-.51**	(.84)		
7. Job Control	3.92	.71	.18	.36**	.24†	-.07	.40**	-.38**	(.90)	
8. Psychological Punishment	2.55	.79	-.08	-.46**	-.36**	.20†	-.48**	.23†	-.47**	(.84)

Note. The correlations below the diagonal represent between-person associations (for variables 1 through 8, we computed the between-person correlations using individuals' aggregated scores; n = 68). The correlations above the diagonal represent within-person associations and were estimated from HLM models with single standardized level 1 variables and no level 2 variables (n = 546-558, pairwise). Reliabilities are reported on the diagonal in parentheses; for the within-individual variables, reliability values were averaged over measurements.
†p<.1, *p<.05, **p<.01 (2-tailed tests).

TABLE 2

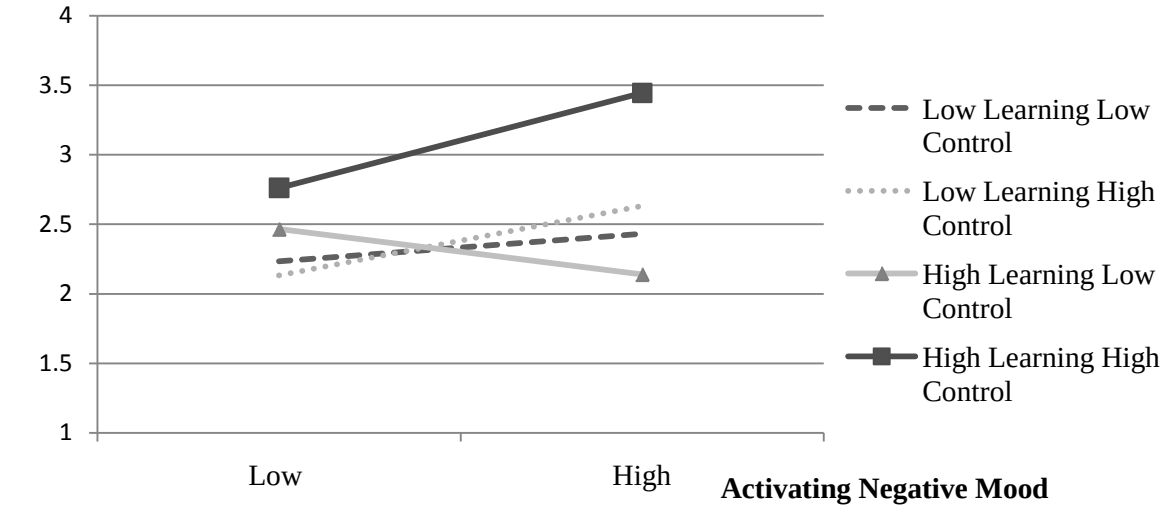
HLM Estimates of the Effect of Activating Mood States on Creative Process Engagement

Estimate	Models Predicting CPE	
	Model 1	Model 2
Intercept	2.53**	2.61**
Control variables		
Intrinsic motivation	.34**	.35**
Activating positive mood	.30*	.27*
Level 1 variable		
Activating negative mood	.20*	.19*
Level 2 variables		
Learning goal orientation	.32*	
Job control	.30*	
Avoidance goal orientation		-.10
Psychological Punishment		-.06
Interaction terms		
Learning x control	.49**	
Learning x negative mood	-.12	
Control x negative mood	.35**.	
Learning x control x negative mood	.35**	
Avoidance x punishment		.02
Avoidance x negative mood		-.13
Punishment x negative mood		-.07
Avoidance x punishment x negative mood		.19*
R^2	.20	.15

Note. Values are unstandardized regression coefficients. To account for autocorrelated residuals and for time trends that may have been present in the data, all models included lagged creative process engagement (CPE) and a time index as control variables. To form the lagged variable, momentary CPE scores were lagged by one period. The scores of the Level-1 variables were centered at the individual's means to eliminate between-individual variance (n = 415, pairwise). The scores of the Level-2 variables were grand-mean centered.

* p<.05; ** *p* <.01 (two-tailed tests)

FIGURE 1
Interactive Effects of Learning
Goal Orientation, Job Control, and Activating Negative Mood on CPE



Start the Y scale at about 1.5, not 0. Same for next table. In fact, scores below 1 aren't even possible as that was the anchor for the lowest scale point, so it's misleading (in a way that only hurts you) to have the Y axis go down to 0.

FIGURE 2
Interactive Effects of Avoid
Goal Orientation, Psychological Punishment, and Activating Negative Mood on CPE