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RESEARCH ARTICLE

The impact of anger on creative process engagement: The role of social contexts

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Summary

Drawing on the cognitive persistence perspective of creativity and conservation of resources theory, we investigated how 2 social contexts (perceived relationship conflict and coworker support for creativity) influence the relationship between anger and creative process engagement (CPE) in organizations. We tested our hypotheses using 422 daily surveys from 98 participants, collected over 5 consecutive workdays. The results show that anger perceived relationship conflict and coworker support for creativity interact to influence CPE. Specifically, when relationship conflict is high, the anger–CPE relationship is positive for employees who receive high coworker support for creativity, but negative for those who receive low coworker support for creativity. In contrast, when relationship conflict is low, the anger–CPE relationship is positive but does not differ at high versus low coworker support for creativity.

KEYWORDS

anger, coworker support for creativity, creative process engagement, perceived relationship conflict

1 | INTRODUCTION

As employee creativity or the generation of new and useful ideas to improve products, services, and processes has become an important source of competitive advantage (Anderson, Potočnik, & Zhou, 2014; Drazin, Kazanjian, & Glynn, 2008; Zhang & Bartol, 2010), organizations are increasingly seeking to cultivate employee creativity. To bring creative ideas into fruition, employees not only need to actively engage in internal cognitive processes (e.g., identifying and defining problems, searching relevant information, and generating new ideas), but also effectively interact with significant others such as coworkers (Amabile, Conti, Coon, Lazenby, & Herron, 1996). Organizations thus face the challenge of how to foster individual creative processes in an increasingly interdependent work environment.

Given its implications for facilitating creative processes and outcomes (Amabile, 1996; Gilson & Shalley, 2004; Zhang & Bartol, 2010), creative process engagement (CPE), has attracted much research attention. CPE refers to a motivational process in which individuals seek "cognitively, behaviorally and emotionally" to produce creative outcomes (Drazin et al., 2008, p. 269). A number of empirical studies have explored antecedents and boundary conditions of CPE (e.g., To, Fisher, Ashkanasy,, & Rowe, 2012; Zhang & Bartol, 2010; Q. Zhou & Pan, 2015). Although much is now known about CPE and despite the documented influence of emotions on work engagement (Kahn, 1990), the question of how employees' affective experiences at work influence their motivation to engage in creative processes still remains poorly understood (Ashkanasy & Dorris, 2017; Brief & Weiss, 2002; Drazin et al., 2008; To, Tse, & Ashkanasy, 2015). In particular, previous studies have neither adequately addressed the motivational and behavioral implications of discrete emotions such as anger for CPE (Amabile, Barsade, Mueller, & Staw, 2005; Baas, De Dreu, & Nijstad, 2008; Brief & Weiss, 2002; Davis, 2009; Raghunathan & Pham, 1999), nor have they fully taken social contexts into account to identify the circumstances under which emotions may or may not lead to CPE (Davis, 2009; González-Gómez & Richter, 2015; To et al., 2012). Examining how anger, one of the most frequently experienced and recognized discrete emotions in organizational contexts (Averill, 1982), influences CPE in different social contexts would shed light on the unclear impact of emotions on CPE.

Although most of the research on anger in organizational contexts has focused on negative workplace behaviors (e.g., Barclay, Skarlicki, & Pugh, 2005; Geddes & Callister, 2007; Rodell & Judge, 2009), researchers have recently debated whether anger can be functional and adaptive leading to positive workplace behaviors such as creativity (Gibson & Callister, 2010). Indeed, anger has been shown to be predictive of creativity in laboratory settings (Baas et al., 2008). However,

scholars have questioned whether the effects of induced emotions on creativity in laboratory settings may replicate in organizations (Amabile et al., 2005). Unlike their counterparts in laboratory settings who are usually asked to conduct their creative tasks independently, employees tend to carry out their creative efforts in complex and dynamic social contexts (Amabile, 1996; Amabile et al., 1996). There is widespread recognition that employees' affective experience interact with social contexts to influence creativity-relevant motivational processes (e.g., Ashkanasy & Dorris, 2017; Davis, 2009; Ford, 1996; George & Zhou, 2002, 2007). As George and Zhou (2002) suggest, employees derive cues from their work environment or contexts regarding their ongoing creative activities. These cues help them assess the extent to which their creative efforts are likely to result in desirable outcomes.

Although the extant research has emphasized the role of facilitative social contexts in materializing the creative potential of various affective experiences (e.g., George & Zhou, 2002; George & Zhou, 2007; González-Gómez & Richter, 2015; To et al., 2012), contexts that directly or indirectly restrict or hinder employees' creative expression (namely, inhibitive social contexts) have received scant research attention (J. Zhou & Hoever, 2014). It is an important omission. First, facilitative and inhibitive social contexts represent two domains in the work environment. The presence of facilitative contexts does not exclude the existence of inhibitive social contexts (Choi, Anderson, & Veillette, 2009; Duffy, Ganster, & Pagon, 2002). Research needs to examine the influence of both facilitative and inhibitive social contexts on employees' creative performance. Second, and more importantly, research has shown that inhibitive social contexts (e.g., relationship conflict), under certain circumstances, can benefit creativity (e.g., De Dreu & Nijstad, 2008; Jung & Lee, 2015). Consequently, it is important to identify specific conditions under which inhibitive social contexts can be harnessed to render creative performance. This study sought to investigate how perceived relationship conflict, a well-recognized inhibitive social context (Jehn, 1995; van Dyne, Jehn, & Cummings, 2002) influences the relationship between anger and CPE. Specifically, we first focus on the cognitive and motivational implications of relationship conflict for employees who experience anger at work. We then derive interactive effects of anger, relationship conflict and coworker support for creativity on CPE, drawing on conservation of resources theory (Hobföll, 1989) and the documented influence of coworker support for creativity (George & Zhou, 2002; Madjar, 2008; Madjar, Oldham, & Pratt, 2002). Specifically, we posit that angry employees who perceive high relationship conflict at work may demonstrate increased CPE when they receive coworkers' support for creativity, but will show decreased CPE when such support is absent.

This study makes two significant contributions to the existing literature. First, we contribute to the creativity literature by shedding light on how and when anger influences CPE. Although prior research has focused on the internal cognitive process that underpins the influence of anger on creative performance in laboratory settings (Baas et al., 2008), we aim to identify social contexts in which angry employees may engage in or withdraw from creative processes. Consistent with the organizational behavior perspective that emphasizes contextual effects and norms (Gibson & Callister, 2010), we study CPE as a function of employees' interactions with their social environment, as well as their affective experiences (Drazin et al., 2008; Ford, 1996). Thus, we not only extend previous research to organizational settings, but also provide a more robust test of the impact of anger on CPE. Second, by examining the roles of perceived relationship conflict and coworker support for creativity in the anger–CPE relationship, our study complements prior research that has predominantly focused on facilitative social contexts (e.g., George & Zhou, 2002, 2007; To et al., 2012), and provides a more realistic representation of the work environment (J. Zhou & Hoever, 2014). In particular, we not only augment recent effort in identifying circumstances under which inhibitive social contexts can foster creativity (e.g., Choi et al., 2009; De Dreu & Nijstad, 2008; Jung & Lee, 2015), but also shed light on the role of facilitative social contexts (e.g., coworker support for creativity) in the context of inhibitive social contexts. Although the creativity literature has generally extolled the benefits of supportive social contexts (e.g., Amabile, 1996; George & Zhou, 2007; Madjar et al., 2002), our finding helps to address a specific and practically important question of when such contexts are more or less important in fostering employee creativity. Such an undertaking should help organizations to identify appropriate interventions to address the adverse effects of inhibitive social contexts.

1.1 | Theoretical background and hypothesis development

State anger refers to a temporary emotional state evoked by adverse events, consisting of feelings ranging from irritation to annoyance, fury or rage (Glomb, 2002). Conceptually, state anger can be contrasted to trait anger, which is a longer-term disposition to experience more anger—eliciting situations—both more frequently and more intensely (Spielberger, 1999). Anger has been noted to stem primarily from "personal offense" (Solomon, 1983, p. 284) or individuals being attacked or injured (Lazarus, 1991). Given its negative valence, anger has traditionally been linked to counterproductive behaviors in organizational settings (Gibson & Callister, 2010). However, from an activation perspective, anger may trigger the engagement of centrally organized motivational systems and mobilize the energy needed to sustain attention and effort in creatively solving problems (Baas, De Dreu, & Nijstad, 2011; De Dreu, Baas, & Nijstad, 2008).

Accordingly, and more specifically, anger may lead to heightened CPE because it triggers heuristic information processing (Tiedens & Linton, 2001), or cognitive flexibility (Baas et al., 2011), which enables angry individuals to explore and make connections of a wide range of cognitive categories (Lerner & Tiedens, 2006). Additionally, anger increases individuals' energy level urging them to take actions and contribute more effort to their current tasks (Seo, Barrett, & Bartunek, 2004; Seo, Bartunek, & Barrett, 2010), leading to heightened creative performance. Drawing on a sample of students working on research projects, To et al. (2012) reported that activating negative emotions (including angry, upset, ashamed, and anxious) positively related to CPE.

However, much research in organizational settings has shown that social contexts play a critical role in the relationship between employees' affective experiences and creative efforts (e.g., Amabile et al., 2005; George & Zhou, 2002, 2007; J. Zhou & George, 2001). It is intuitively plausible that anger may not always lead to CPE in the

workplace. Rather, depending on their daily experiences at work, angry employees may choose to minimally engage in creative processes and generate simple and routine solutions, or may choose to fully engage in creative processes and expend resources (e.g., time and energy) in an effort to come up with creative solutions (Drazin, Glynn, & Kazanjian, 1999; Kahn, 1990). We propose that the social contexts in which angry employees operate are likely to influence their ability to be task focused and therefore, the motivation to engage in creative processes leading to CPE. One possible social context that may influence angry employee's CPE is perceived relationship conflict (e.g., De Dreu & Weingart, 2003; James, Chen, & Goldberg, 1992; Jex, 1998; van Dyne et al., 2002).

1.2 | The function of perceived relationship conflict

Perceived relationship conflict describes the extent to which individuals perceive "interpersonal incompatibilities" within their work group and the existence of "tension, animosity and annoyance among group members" (Jehn, 1995, p. 258). While relationship conflict taps into conflict status within groups, perceived relationship conflict specifically reflects individuals' evaluation of their immediate social environment as being detrimental or beneficial. Research has suggested that while relationship conflict examined at the group level is detrimental to group level outcomes, its individual level equivalent may have different motivational and cognitive implications for individual employees (De Dreu, 2008; De Dreu & Nijstad, 2008; Jung & Lee, 2015). Accordingly, and consistent with James et al. (1992), as well as more recent research by Breugst, Patzelt, Shepherd, and Aguinis (2012), we conceptualized relationship conflict as an individual level construct.

Prior research has suggested that relationship conflict poses a threat to employees' sense of safety in the workplace (Kahn, 1990). This, in turn, reduces their confidence in, and commitment to, achieving their goals (Chen, Sharma, Edinger, Shapiro, & Farh, 2011), and discourages their engagement in the challenging aspects of tasks such as creativity (De Dreu & Weingart, 2003; Jex, 1998). However, scholars from a cognitive persistence perspective argue that conflictual situations stimulate cognitive persistence, that is, prolonged and active search for relevant information and systematic exploration of possible solutions, leading to creativity (De Dreu et al., 2008). Compared with their counterparts in conflict-free situations, individuals who experience conflicts, especially those who perceive the conflictual situation to obstruct their goals (Jung & Lee, 2015), are more motivated to devote their cognitive resources to overcome the problematic situation and more persistent in finding creative solutions.

Accordingly, we argue that relationship conflict in the work environment may heighten angry employees' CPE by stimulating their cognitive persistence and motivation to overcome the problematic situation. For employees who experience anger, a work environment featuring relational tensions means that they need to pursue their personal goal with caution to avoid jeopardizing their social status and well-being. In other words, the experience of relational tension in the work environment inhibits angry employees from acting and expressing themselves consistent with their emotional state (Boudens, 2005; Fitness, 2000). Given that anger has been associated with a tendency to confront obstacles (Lerner & Tiedens, 2006), angry employees are likely to engage in effortful and detailed informational processing in order to determine the best course of action.

However, we further argue that the persistent and effortful cognitive processing triggered by relationship conflict is a necessary, but insufficient condition for angry employees to engage in CPE in the work domain. This is because such cognitive processing "requires executive control and working memory capacity and taxes cognitive resource and energy," thus is "costly" (Roskes, De Dreu, & Nijstad, 2012, p. 244). Angry employees may be reluctant to expend their cognitive resources and effort in creative processes unless there are additional incentives and resources (Roskes et al., 2012). Coworkers that encourage and support creativity provide critical emotional and information resources, as well as social cues that direct employees' attention and energy toward task-related creative activities (Madjar, 2008; Madjar et al., 2002; J. Zhou & George, 2001). Consequently, drawing on conservation of resources theory (Hobföll, 1989), we propose that angry employees' CPE in relationship conflict situations may differ depending on coworker support for creativity.

1.3 | The function of coworker support for creativity

According to conservation of resources theory, individuals are instinctually motivated to obtain, retain, protect, and foster resources. Resources are defined as "those objects, personal characteristics, conditions or energies that are valued by the individuals or that serve as means for attainment of these objects, personal characteristics, conditions or energies" (Hobföll, 1989, p. 516). A strength of conservation of resources theory is its ability to explain how individuals adopt different response strategies in a potential resource loss situation. In such a situation, people may be motivated either to invest existing resources to generate new resources to offset the potential loss (resource acquisition), or to withdraw from resource investment to conserve existing resources or avoid future losses (resource conservation). Whether one adopts a resource conservation or acquisition strategy is dependent on his or her assessment of the likelihood of succeeding in acquiring new resources to offset their losses (Halbesleben, Neveu, Paustian-Underdahl, & Westman, 2014; Hobföll, 1989; Kiazad, Seibert, & Kraimer, 2014; Ng & Feldman, 2012). Thus, in situations where valued new resources are deemed tenable and therefore likely to offset potential resource losses, individuals are motivated to expend existing resources to acquire new resources. In contrast, in situations where valued new resources are unlikely to be gained due to situational constraints, or resource acquisition is seen as risky (e.g., causing future loss), individuals are likely to withdraw from resource acquisition and rather conserve their resources.

Although supervisors constitute an important source of support in employees' immediate work environment, employees are more frequently and consistently exposed to coworkers than supervisors (Ng & Sorensen, 2008), thus more likely to rely on coworker support in their creative endeavors. Therefore, we chose to focus on coworker support for creativity in this study. Coworker support for creativity is defined as a social context in which coworkers listen, express concern, and provide nurture and encouragement in reference to fellow employees' creative endeavors in the workplace. Resources and social cues received from coworkers have been shown to be critical assets in

fostering employee creativity (Amabile et al., 1996; González-Gómez & Richter, 2015; Hirst, van Knippenberg, Zhou, Zhu, & Tsai, 2015; Woodman, Sawyer, & Griffin, 1993).

Under high coworker support for creativity, coworkers provide not only an emotionally supportive social environment for angry employees to feel valued, but also informational resources which can be leveraged to promote problem identifying and solving activities (Baer & Oldham, 2006; Madjar, 2008; Madjar et al., 2002; J. Zhou & George, 2001). Coworkers' constructive and positive feedback on creative ideas provides specific knowledge and information required in the creative process, making angry employees feel right about and motivated to pursue creative goals (Higgins, 2000). In addition, coworker support provides social cues indicating that creativity is accepted and recognized. The resulting behavioral norms in work environments (Gilson, Mathieu, Shalley, & Ruddy, 2005) lead angry employees to see the value of being creative and the possibility of using CPE as a viable route to regain positive social self (e.g., recognition and acceptance). Although no direct empirical evidence exists for a positive impact of coworker support on CPE among angry employees, indirect evidence can be derived from J. Zhou and George's (2001) research. They found that dissatisfied employees were more likely to use creativity to address problems at work when coworker support is high rather than low.

How might high versus low coworker support for creativity influence angry employees' CPE when they at the same time experience high relationship conflict? The value of social support has been shown to be context specific because the same resources can be valuable in one context but less so in another (Cohen & Wills, 1985; Hobföll, 1989). The key difference lies in whether such support is instrumental in helping individuals achieve their goals or satisfy their needs (Halbesleben et al., 2014; Kiazad et al., 2014). As discussed above, experiencing relationship conflict, angry employees are cognitively alert and motivated to overcome this problematic situation. However, the cognitive costs of engaging creative processes may discourage them from expending their cognitive resources and energy. The presence of coworker support for creativity constitutes a much-needed and relevant resource that helps angry employees to reframe the situation and see their creative efforts as an investment to gain new resources rather than a cost. Coworkers' encouragement and useful informational resources also help angry employees to be persistent in their creative efforts. Thus, we expect angry employees in high relationship conflict situations to demonstrate high levels of CPE when they receive high levels of coworker support for creativity.

Conversely, with low levels of coworker support for creativity, angry employees experiencing high relationship conflict are likely to withdraw from task-related creative processes. Without external support, a work environment characterized by high relationship conflict signals to angry employees that the social context in general is threatening. Although angry employees may desire to change such a threatening situation, they do not have useful information and feedback that help them to focus on tasks and explore new ideas. Without coworkers' support of creativity, angry employees may also be uncertain about how their creative efforts will be received by coworkers. Thus, angry employees may choose to focus on routine work rather than invest their cognitive resources and energy in effortful creative processes.

Although our focus is on angry employees' CPE under high relationship conflict situations, it is also important to understand how the same group of employees may react in low relationship conflict situations. The social support literature suggests that social support is less effective or valuable when it does not match situational needs (Cohen & Wills, 1985; Halbesleben et al., 2014; Hobföll, 1989). Accordingly, we argue that coworker support for creativity is less valuable for angry employees experiencing low relationship conflict. Without relational conflict the work environment may be deemed safe enough for angry employees' to act and think according to their emotional state thereby resulting in creative processes (Baas et al., 2008, 2011). Indeed, researchers have reported that social support provides limited additional value to those who are motivated to be creative (Madjar et al., 2002; Tierney, Farmer, & Graen, 1999) and described this phenomenon as "diminishing returns" (J. Zhou & Hoever, 2014, p. 352). Taken together, we posited the following:

Hypothesis: Anger, perceived relationship conflict, and coworker support for creativity interact to influence CPE such that the relationship between anger and CPE under high relationship conflict conditions will be positive when coworker support for creativity is high, but negative when coworker support for creativity is low. In contrast, the relationship between anger and CPE under low relationship conflict conditions will be positive regardless of level of coworker support for creativity.

2 | METHOD

2.1 | Participants and procedure

We recruited participants from three multinational management consultancy companies in Portugal, who provide services in the field of information technology, financial management, and human resource management, respectively. We selected management consultants because their work involves the development of creative solutions to meet clients' requirements. Prior to data collection, we informed participants of the study's purpose, as well as its confidentiality and methodology.

We used a web-based survey tool (i.e., Qualtrics) to send out two types of questionnaires: general and daily surveys. The general survey—containing questions on perceived relationship conflict, coworker support for creativity, high effort task, trait anger and demographics variables—was administered only once at the project's beginning. We initially invited 390 employees in 50 teams from the three companies to participate in the study, out of which 188 employees in 24 teams answered the general questionnaire, representing a response rate of 48.2%.

One week after the general survey, we administered daily online questionnaires that included state anger and CPE at the end of every workday, for a work week. We started this process at the beginning of a normal work week (i.e., five consecutive workdays). Out of 940 possible daily surveys, we obtained 422 daily surveys—a 44.9% response rate—from 98 participants, who completed the daily questionnaire for at least 3 out of the 5 days (Bledow, Rosing, & Frese, 2013). Only 41 out of the 90 individuals who dropped out from the

final sample gave their age, gender, tenure, and education, revealing that they did not differ significantly from the remaining 98 individuals in terms of demographic characteristics. We also compared the 98 continuing participants and 90 dropouts across the three participating organizations and found that the dropouts were unlikely to have been influenced by organizational membership, indicating that the data were missing at random. The majority of the final participants (64.29%) were males with an average age of 31.31 years old (*SD* = 5.86) and an average job tenure of 4.20 years (*SD* = 2.68). Almost all participants hold a bachelor's degree or higher (93.88%).

2.2 | Measures

The questionnaires were originally developed in English and then translated into Portuguese. We followed the translation and back translation procedures suggested by Brislin (1980), to ensure the accuracy of the translated questionnaires.

2.2.1 | Creative process engagement

An 11-item scale developed by Zhang and Bartol (2010) was used to measure three dimensions of CPE: problem identification (3 items), information searching and encoding (3 items), and idea generation (5 items). The lead question for this scale was as follows: "Today, to what extent did you engage in the following actions when seeking to accomplish an assignment or solve a problem?" Response options were1 = "*never*"; 2 = "*rarely*"; 3 = "*occasionally*"; 4 = "*frequently*"; and 5 = "*very frequently*". Sample items were "I spent considerable time trying to understand the nature of problems" for problem identification; "I consulted a wide variety of information" for information search and encoding; and "I considered diverse sources of information of idea generation" for idea generation. The scale's alpha reliability is .95.

2.2.2 | State anger

A10-item scale from the State–Trait Anger Expression Inventory developed by Forgays, Forgays, and Spielberger (1997) was used to measure state anger. The lead statement for this scale was "Please indicate your feelings today." Response options were 1 = "*not at all*"; 2 = "*somewhat*"; 3 = "*moderately so*"; and 4 = "*very much so*". The items are "I was furious," "I was irritated," "I was angry," "I was mad," "I was burned up," "I felt yelling," "I felt breaking," "I felt banging," "I felt hitting," and "I felt swearing." The scale's alpha reliability is .95.

2.2.3 | Perceived relationship conflict

A 4-item scale developed by Jehn (1995) was used to measure relationship conflict. Response options were 1 = "*none*," 2 = "*a bit*," 3 = "*moderately*," 4 = "*much*," and 5 = "*a very great deal*." Sample items are "How much personal friction is there among members of your team?" and "To what extent are grudges evident among members of your team?" The scale's alpha reliability is .90.

2.2.4 | Coworker support for creativity

A 3-item scale adapted from Madjar et al. (2002) was used to measure coworker support for creativity. The items are "My coworkers are almost always supportive when I come up with a new idea about my job," "My coworkers give me useful feedback about my ideas concerning the workplace," and "My coworkers are always ready to support me if I introduce an unpopular idea or solution at work." Response options ranged from 1 = "*strongly disagree*" to 7 = "*strongly agree*". The scale's alpha reliability is .90.

2.2.5 | Control variables

We considered several potentially relevant control variables including job tenure, high effort task and trait anger. Scholars have suggested that experienced employees (i.e., those with longer tenure) may tend to rely on mundane solutions and be reluctant to expend much effort generating new ideas (Ward, Smith, & Finke, 1999). High effort task impacts CPE to the extent that complex and challenging tasks influence workers' motivation to engage in creative efforts (Shalley & Gilson, 2004). Meanwhile, researchers have posited a relationship between trait and state anger as individuals with high trait anger more quickly detect and respond to threat and provocation than those with low trait anger do (Wingrove & Bond, 2005). Trait anger has also been found to be related to creativity (Akinola & Mendes, 2008). Given these relationships, CPE may be a function of employees' work experience, task motivation or stable individual differences, rather than state anger. Thus, to eliminate alternative explanations and demonstrate the unique relationship between state anger and CPE, it was important to partial out the variance between these controls and our predictor and dependent variables.

Tenure was measured by years of work experience in the organization. High effort task was measured by a 5-item scale adapted from Hackman and Oldham (1980). Sample items are "my job tasks are very difficult" and "there is a lot of daily effort." Response options ranged from 0 = "*never*" to 5 = "*always/everyday*." The scale's alpha reliability is .87. Trait anger was measured by two items (i.e., "I am quick tempered" and "I have a fiery temper"; Forgays et al., 1997) on a 4-point scale (1 = "*almost never*" to 4 = "*almost always*"). The scale's alpha reliability is .78. Finally, we created two organization dummy variables, Org1 and Org2 to represent the three participating organizations to control for organizational differences.

2.3 | Scale validities

As our data relied on self-reports for both day- and person-level questionnaires, common-method variance could influence the relationships examined (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). We, therefore, conducted confirmatory factor analyses to test the distinctiveness of our study variables. The hypothesized two-factor (i.e., state anger and CPE) model for the day-level data showed a good fit to the data (χ^2 = 326.15, p < .001, df = 109, CFI = .97, RMSEA = .07, SRMR = .03). The analyses also confirmed the goodness of fit of the hypothesized four-factor model (high effort task, trait anger, coworker support for creativity, and perceived relationship conflict) for the person level data (χ^2 = 85.14, p < .001, df = 71, CFI = .98, RMSEA = .05, SRMR = .05). We then compared the hypothesized models to a single factor model in which all variables were loaded on a single construct for the day- and person-level data, respectively. The results showed that both the hypothesized two-factor model at the day level and the hypothesized four-factor model at the person level fit the data better than the

one-factor model ($\Delta\chi^2$ = 2192.955; *df* = 1; $\Delta\chi^2$ = 557.17; and *df* = 6, respectively). This indicated that our study variables were distinctive.

In addition, we tested construct and discriminant validity by calculating the composite reliability and average variance extracted (AVE). The composite reliability results showed that all variables exceeded .70, the minimum cut-off values (Fornell & Larcker, 1981). The AVE for all variables exceeded the .50 cut-off value, indicating a reasonable convergent validity (Fornell & Larcker, 1981). Finally, we compared the AVE of each variable to its shared variance with all other variables (Farrell, 2010). The average variance shared of each variable was always less than its AVE suggesting that the scales for our study have a satisfactory level of discriminant validity (Hair, Black, Babin, Anderson, & Tatham, 2006).

2.4 | Analytic strategy

Given the nested structure of our data, in which days (Level 1) were nested in persons (Level 2) who were nested in teams (Level 3), we used hierarchical linear modeling (HLM) to account for the non-independence of observations (Aguinis, Gottfredson, & Culpepper, 2013; Raudenbush & Bryk, 2002). Specifically, in our analysis, we included daily state anger and CPE at Level 1 (day-level), variables that vary across participants (i.e., tenure, trait anger, high effort task, perceived relationship conflict and coworker support for creativity) at Level 2 (person-level). Finally, we used Level 3 (team-level) to capture employees' team membership and organizational affiliation. Following Enders and Tofighi's (2007) suggestion, we group mean centered state anger to eliminate the potential between-person variance in the predictor variable.

3 | RESULTS

Table 1 displays the descriptive statistics and correlations among all study variables. Day- and person-level variables are presented separately.

The results of the HLM analyses are summarized in Table 2. Following the procedures recommended by Aguinis et al. (2013) and using HLM 7.0 software, we first estimated a null model for CPE, in which no predictors were specified for either day-, person- or team-level. The results revealed that variance in day-level CPE explained was significant at person-level ($p < .001$) but non-significant at team-level ($p > .05$). Furthermore, the ICC1 for CPE was .43, indicating that a significant amount of variance in daily CPE resided within persons.

We then specified a main effects model (Model 1), in which only state anger, the controls (i.e., tenure, high effort task, trait anger, Org1 and Org2), perceived relationship conflict and coworker support for creativity were included. The results showed that neither state anger (γ = .03, *SE* = .06, $p > .05$), perceived relationship conflict (γ = −.04, *SE* = .08, $p > .05$), nor coworker support for creativity (γ = .01, *SE* = .04, $p > .05$) was significantly related to CPE. To test our hypothesis, we specified a slope-as-outcome model (Model 2) that tests whether the strength and direction of the relationship between anger and CPE vary at different levels of perceived relationship conflict and coworker support for creativity. In addition to the variables in Model 1 (state anger, the controls, perceived relationship conflict and coworker support for creativity), we entered the three 2-way interaction terms as combinations of state anger, perceived relationship conflict and coworker support for creativity and the 3-way interaction term of the same three variables. As shown in Table 2 (Model 2), the 3-way interaction term was significant (γ = .32, *SE* = .12, $p < .01$). Meanwhile, the total between-person variance in slopes dropped from .04 in Model 1 to .01 in Model 2, indicating the inclusion of the cross-level interaction terms in Model 2 accounted for 75% change in the total variance of the slope of CPE on anger across persons.

To further interpret the nature of the significant 3-way interaction, we computed and plotted the simple slopes of CPE on anger at high (+1 *SD*) and low (−1 *SD*) levels of perceived relationship conflict and coworker support for creativity (e.g., Aiken & West, 1991; Dawson, 2014). The results of simple slope tests showed that when perceived relationship conflict was high, the simple slopes for CPE on state anger differed significantly at high versus low levels of coworker support for creativity (t = 9.94, $p < .001$). As shown in Figure 1, under high relationship conflict and high coworker support for creativity conditions, the simple slope was significantly positive (b = .68, *SE* = .10, t = 6.88, p = .00). By contrast, under high-relationship conflict and low-coworker support for creativity conditions, the simple

TABLE 1 Means, standard deviations, and correlations of study variables

	Mean	*SD*	1	2	3	4	5	6	7	8	9
Day-level variables (*N* = 422)											
1 State anger	1.23	.53	**(.95)**								
2 CPE	3.00	.87	.06	**(.95)**							
Person-level variables (*N* = 98)											
3 Org1[a]			.13**	.08							
4 Org2[a]			.18**	.05	−.35**						
5 Tenure	4.20	2.68	−.03	−.10*	−.27**	.14					
6 High effort task	1.84	1.09	.25*	.15	−.10	.79**	−.02	**(.87)**			
7 Trait anger	1.73	.70	.23*	.21**	.08	−.01	−.03	.18	**(.78)**		
8 Perceived relationship conflict	1.76	.69	.34**	−.02	.02	.13	.07	.10	.25*	**(.90)**	
9 Coworker support for creativity	5.22	1.10	−.10	−.02	−.01	−.11	.11	−.08	.05	−.04	**(.90)**

Note: CPE = creative process engagement.

[a]Dummy variable aggregated to the person level. Internal consistency reliabilities are in bold on the diagonal parentheses.

*$p < .05$; **$p < .01$.

TABLE 2 Multilevel modeling analysis

	Null model	Model 1	Model 2
Intercept	3.00(.07)***	2.99(.06)***	2.99(.06)***
L1: Day-level (N = 422)			
State anger		.03(.06)	.18(.13)
L2: Person-level (N = 98)			
Tenure		−.02(.02)	−.02(.02)
High effort task		.13(.11)	.14(.12)
Trait anger		.24(.08)**	.24(.09)**
Perceived relationship conflict		−.04(.08)	−.08(.07)
Coworker support for creativity		.01(.04)	.01(.05)
L3: Team-level (N = 21)			
Org1[a]		.11(.13)	.08(.13)
Org2[a]		−.08(.29)	−.11(.31)
Cross-level interactions			
State anger *x* perceived relationship conflict			−.09(.18)
State anger *x* coworker support for creativity			.26(.17)
Coworker support for creativity *x* perceived relationship conflict			.09(.06)
State anger *x* coworker support for creativity *x* perceived relationship conflict			.32(.12)**
Variance components			
L1 variance	.43	.43	.41
L2 variance	.32	.27	.27
L2 slope variance		.04	.01
Pseudo R^2		.07	.09

[a]Dummy variable.

Pseudo R^2 was calculated following Snijders and Bosker (1999).

*p < .05; **p < .01; ***p < .001.

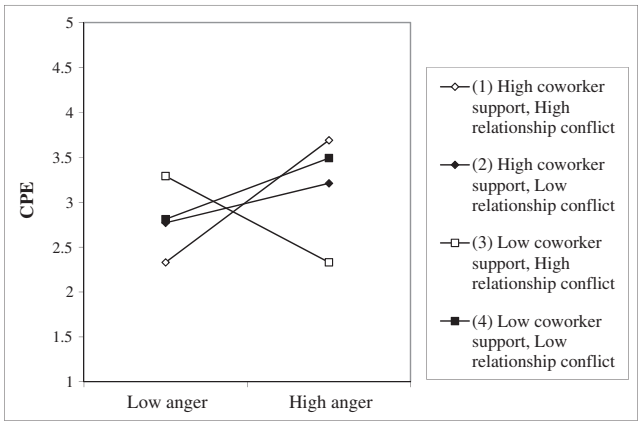

FIGURE 1 The 3-way interactive effect of anger, perceived relationship conflict and coworker support for creativity on creative process engagement (CPE)

slope was significantly negative (b = −.48, SE = .04, t = −10.89, p = .00). Meanwhile, when perceived relationship conflict was low, the simple slope for CPE on state anger was positively at both high (b = .22, SE = .12, t = 1.79, p = .07) and low (b = .34, SE = .10, t = 3.35, p = .00) levels of coworker support for creativity but did not differ significantly (t = −.89, p > .05). Thus, our hypothesis received support.

4 | DISCUSSION

There is growing recognition among researchers that employees' affective experiences may influence employees' CPE, an important precursor to creative outcomes (e.g., Drazin et al., 2008; To et al., 2012; To et al., 2015). However, thus far, the literature shows a limited understanding of when anger, a commonly experienced emotion in the workplace, may or may not lead to employees' CPE. In this paper, we were specifically interested in how perceived relationship conflict and coworker support for creativity shape angry employees' CPE in organizations. Our results indicate that the relationship between anger and CPE is contingent upon the aforementioned two social factors. Specifically, angry employees who perceive high levels of relationship conflict are more likely to engage in creative processes when they receive high coworker support for creativity, but withhold their creative efforts when they do not receive such support.

4.1 | Theoretical implications

The results of this study have several important theoretical implications. First, although prior research has reported a positive relationship between anger and creativity in laboratory settings (Baas et al., 2008), by considering the influences of social contexts, our study offers a more comprehensive account of the anger–CPE relationship in organizational settings. Drawing on the cognitive persistence perspective of creativity (De Dreu & Nijstad, 2008) and conservation of resources theory (Hobföll, 1989), we have illustrated the importance of both inhibitive and facilitative social contexts (i.e., perceived relationship conflicts and coworker support for creativity) in shaping angry employees' CPE. Our finding that angry employees experiencing high relationship conflict are more likely to engage in creative processes when coworker support for creativity is high rather than low suggests that the impact of anger on CPE is not uniform across situations and

employees. Rather than focusing on the question whether anger can indeed lead to CPE or not in organizations, future research should build on the present finding and explore further conditions under which anger may or may not lead to CPE.

This study also contributes to our understanding of the impact of relationship conflict on creativity by delineating some of the conditions when relationship conflict may benefit CPE. Although prior research has suggested that relationship conflict inhibits employee creativity (e.g., James et al., 1992; van Dyne et al., 2002), more recently, scholars has argued that conflictual situations, under certain circumstances, may motivate individuals to devote their cognitive resources to engage in creative problem-solving processes (De Dreu & Nijstad, 2008). For example, in an experimental setting, Jung and Lee (2015) showed that individuals who value relationships demonstrated increased creativity when the conflictual situations involved relational issues. Extending this line of research to an organizational setting, and considering the cognitive costs associated with the persistent and in-depth cognitive processing triggered by conflictual situations (Roskes et al., 2012), our study demonstrated that angry employees' CPE in high relationship conflict situations is contingent on coworker support for creativity. This finding provides empirical support for conservation of resources theory which suggests that individuals in a potential loss situation are motivated to invest existing resources to acquire new resources only when they are endowed with instrumental resources (Halbesleben et al., 2014; Hobföll, 1989). Thus, our study highlights the importance of considering individual's situational resources and constraints, as well as their personal goals (Jung & Lee, 2015), when examining the impact of relationship conflict on creativity. Future research should continue investigating other factors such as leadership (Chen et al., 2011) that may influence the creative implications of relationship conflict.

Our study showed the importance of examining the boundary condition that determines the value of coworker support for creativity for angry employees' creative efforts. Although prior research has generally highlighted the benefits of supportive social contexts for employee creativity (e.g., Madjar, 2008; Madjar et al., 2002; J. Zhou & George, 2001), our study adds an important qualification by showing that the benefits of social support may be contingent on certain contextual conditions. Our finding that coworker support for creativity moderates the anger–CPE relationship when relationship conflict is high rather than low suggests that coworker support for creativity is more critical and meaningful for some specific groups of employees than others – in this research, angry employees who experience high rather than low relationship conflict.

Our results revealed that state anger did not relate to CPE. This finding appears to differ from To et al. (2012), who reported a positive relationship between a cluster of activating negative moods and CPE. One possible reason for this discrepancy is because anger was examined in the present study as an individual discrete emotion rather than as a component of a negative mood cluster. A combination of various activating negative emotions may possibly be more powerful than a single activating negative emotion in terms of predicting CPE. Indeed, González-Gómez and Richter (2015) report that shame –another activating negative emotion in To et al.'s mood cluster, did not have an overall effect on creativity in an organizational setting. Based on these conflicting results, future research should further probe the complex relationships between negative affect and CPE (Amabile et al., 2005; Baas et al., 2008).

Although we focused on state anger in this study, trait anger was included as a control variable. In contrast to state anger, and in line with prior research (Akinola & Mendes, 2008), trait anger was significantly related to CPE ($b = .24$, $p < .01$) in our data. To understand whether the inclusion of trait anger might have contributed to the non-significant relationship between state anger and CPE, we conducted additional analysis and found that the state anger–CPE relationship remained non-significant even when trait anger was excluded. Further analysis showed that, unlike the state anger–CPE relationship, the trait anger–CPE relationship was not contingent on perceived relationship conflict or coworker support for creativity. It appears that while trait anger, a dispositional attribute, is predictive of CPE across situations, state anger is contingent on the influence of social contexts. Future research should further explore the distinctive impact of trait versus state emotions on CPE.

4.2 | Practical implications

Given that anger has been shown to relate to negative behaviors in organizational contexts (Gibson & Callister, 2010), the notion that anger can be conducive to CPE offers a new perspective on the role of anger in the workplace. However, this also entails new challenges, such as how to leverage the implications of anger for employee creativity. Although we do not advocate fostering anger among employees, its inevitability in our increasingly interdependent workplace suggests that organizations need to develop effective interventions to channel the creative implications of anger.

The three-way interaction of anger, relationship conflict, and coworker support for creativity that we uncovered has implications for fostering employee creativity. On the one hand, our finding that angry employees experiencing high relationship conflict can be motivated to engage in creative activities if they receive high levels of coworker support for creativity reinforces the importance of nurturing a supportive social environment. To create such a social environment organizations should promote and nurture “communities of practice” where collegial support for creative ideas and informal knowledge sharing can naturally happen (Wenger & Snyder, 2000). This can be accomplished through the adoption of human resource management policies that encourage and reward knowledge sharing and generally contribute to fellow employees' creative efforts. Although they do not directly target individual creative performance, these interventions may foster a creativity-supportive context that motivates angry employees to channel their anger into creative processes.

On the other hand, although coworker support for creativity may be welcome by all employees across situations, managers must realize that coworker support for creativity is more likely to make a difference for angry employees in high rather than low relationship conflict conditions. Angry employees' creative efforts in high relationship conflict conditions vary significantly depending on the levels of coworker support for creativity they receive. Although high coworker support for creativity motivates this group of employees to engage in creative processes, low coworker support for creativity motivates them to withdraw from such processes. Thus, organizations that wish

to invest in building supportive social contexts to unleash the creative potential of angry employees, should identify and give priority to those who experience high relationship conflict in the workplace.

4.3 | Limitations and future research

This study has some limitations that must be highlighted. First, given the cross-sectional research design—especially in terms of the daily data—the direction of causality cannot be clearly determined. Although both theories (Schwarz & Skurnik, 2003) and empirical studies (To et al., 2012) have found support for a causal relationship between anger and CPE, future research should use longitudinal studies to ascertain the causal status of the relationships reported in this study.

Second, consistent with prior research that used daily surveys (e.g., Bledow et al., 2013), we relied on self-reported data, which raises concerns about the potential influence of common method variance on the findings reported in this paper. However, the confirmatory factor analyses results reveal that the present results cannot be entirely attributed to common method variance. Furthermore, common method variance cannot account for cross-level (i.e., person- and day-level) moderated effects on the relationship between anger and CPE (Lai, Li, & Leung, 2013).

Third, we conceptualized and measured our social context variables (i.e., perceived relationship conflict and coworker support for creativity) at the individual level. However, we cannot know the extent to which personal perceptions of social contexts are shaped by individual and/or idiosyncratic factors or contextual and/or group factors. Future research could extend the current research by including group-level factors such as team climate and leadership behavior (e.g., Choi, Price, & Vinokur, 2003; González-Gómez & Richter, 2015). In addition, we assumed social contexts such as perceived relationship conflict and coworker support for creativity are relatively stable over a short period of time (i.e., one working week) and measured them only once in our study (e.g., González-Gómez & Richter, 2015; To et al., 2012). However, there is a possibility that these social contexts may vary from day to day and directly affect employees' affective experiences rather than operate as moderating factors (e.g., Amabile, Schatzel, Moneta, & Kramer, 2004). Consequently, future research should examine the role of daily social contexts on employees' affective experiences and creative performance at work.

5 | CONCLUSION

Our study demonstrates the role of social contexts in shaping angry employees' CPE in organizations. Specifically, angry employees in high relative to those in low relationship conflict are more reliant on coworker support for creativity in terms of engaging in or withdrawing from creative processes. These findings are important as they help to identify conditions under which anger positively or negatively relates to CPE in organizational contexts and shed light on the function of coworker support for creativity in the context of relationship conflict. In light of the recognition of employee creativity as a source of sustained competitive advantage, future research should extend the findings of this study by examining other affective experiences and contextual factors that may influence employees' CPE.

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