

RESEARCH ARTICLE

Team job-related anxiety and creativity: Investigating team-level and cross-level moderated curvilinear relationships

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Summary

Researchers have examined the effects of individual job-related anxiety on employee attitudes and behaviors but have yet to examine whether team job-related anxiety would have similar or different effects. Building on prior research on negative group affective tone and creativity, we propose that team job-related anxiety has an inverted U-shaped curvilinear relationship with both team and individual creativity. Furthermore, we posit that team cooperativeness moderates those curvilinear relationships. Using a two-wave research design and matched employee-supervisor data from 290 employees nested in 65 teams, we found support for the proposed inverted U-shaped relationships. Moreover, the intermediate level of team job-related anxiety was associated with higher individual creativity in teams with higher cooperativeness. We conclude the study with a discussion of the theoretical and practical implications of our findings.

KEYWORDS

individual creativity, team cooperativeness, team creativity, team job-related anxiety

1 | INTRODUCTION

Job-related anxiety, defined as feelings of apprehension and nervousness about the accomplishment of job tasks (McCarthy, Trougakos, & Cheng, 2016; Parker & DeCotiis, 1983), has received much scholarly and practitioner attention. The American Psychological Association (2012) reported that 40% of Americans experience anxiety during their workday, and, in total, job-related anxiety costs the US economy over \$40 billion annually (Kessler & Greenberg, 2002). Considering the prevalence and significance of job-related anxiety in the workplace, researchers have investigated the effects of job-related anxiety (Cheng & McCarthy, 2018). For example, researchers have suggested that job-related anxiety reduces job performance (McCarthy et al., 2016), increases job dissatisfaction (Boyd, Lewin, & Sager, 2009), engenders work-to-family conflict (Krannitz, Grandey, Liu, & Almeida, 2015), and elicits self-interested behavior (Kouchaki & Desai, 2015; Mawritz, Folger, & Latham, 2014).

Despite these valuable insights, our understanding of job-related anxiety in the workplace is still quite limited. First, scholars have focused mainly on anxiety caused by an employee's own tasks (Cheng & McCarthy, 2018). Because the team is the basic unit for performing tasks, it is surprising that we know so little about whether and how anxiety related to team tasks (i.e., team job-related anxiety) affects team and employee behaviors. Several scholars have noted that a group context has important and unique impacts on group and individual behaviors (Choi & Sy, 2009; Johns, 2006), and "organizational researchers potentially limit their ability to explain individual behavior in organizations when they ignore group context" (Bliese & Jex, 2002, p. 266). A team concept of job-related anxiety provides a more reliable estimation of the work context and usually reveals consequences that differ from individual-based perceptions of job-related anxiety (Bliese & Jex, 2002). Moreover, the investigation of such a team-level characteristic is supported by social information processing theory in that individuals rely on socially constructed attitudes, beliefs, or norms to guide their choices and behaviors (Salancik &

Pfeffer, 1978). Research has shown that socially constructed team-level properties exert considerable influence on employees' behaviors, even after controlling for employees' own prior behavior modes (Mathieu & Kohler, 1990). In responding to the calls from researchers who identified important effects of team context on individual and team outcomes (Bliese & Jex, 1999, 2002; Mathieu & Kohler, 1990; Maynard, Kennedy, & Resick, 2018), we examine the effect of team job-related anxiety in the workplace, above and beyond that of individual job-related anxiety.

Second, although research has revealed a significant negative effect of job-related anxiety on general task performance (Brooks et al., 2016; McCarthy et al., 2016), our knowledge about the relationship between job-related anxiety and creativity is far from complete. It is important to ascertain this relationship because creativity involves complex psychological processes and is subject to the influences of affective experiences (Forgas & George, 2001). The extant research on job-related anxiety and creativity, while limited and largely at the individual level (for both anxiety and creativity), has generated inconsistent findings. For example, Janssen (2004) reported a positive but nonsignificant correlation between job-related anxiety and innovative behavior. Byron and Khazanchi (2011) found an extremely low but stable association between general state anxiety (which differs from the situation-specific state of job-related anxiety) and creative performance. Currently, we know little about the team level relationship. As Bliese and Jex (2002) noted, high-level analyses may reveal relationships not evident in individual-level analyses. An important way to extend prior research, therefore, is to investigate whether and when job-related anxiety at a higher level (i.e., team job-related anxiety) affects creativity. This expansion also responds to calls to examine the generalizability of theory across levels (Chen, Bliese, & Mathieu, 2005).

Mixed findings from prior individual-level research suggest that it is important to consider potential boundary conditions when examining the impact of team job-related anxiety. The lack of investigation into boundary conditions seriously limits both theoretical development and our understanding of practical coping strategies with regard to job-related anxiety (Cheng & McCarthy, 2018). As previous studies on group affective tone have noted, the influences of negative group

affective tone are sensitive to contextual factors (Knight & Eisenkraft, 2015; van der Schalk et al., 2011). Serving as a negative, task-specific team affective state, team job-related anxiety may also exhibit distinctive influences on creativity across different conditions. Indeed, multiple studies have pointed to the need to examine potential conditions that regulate the influences of job-related anxiety in the workplace (Gino, Brooks, & Schweitzer, 2012; Kouchaki & Desai, 2015).

In our attempt to build a multilevel theory on job-related anxiety and employee creativity, we seek to address these theoretical gaps and to advance the extant knowledge through both team- and cross-level approaches. We investigate team job-related anxiety, which refers to team members' shared feelings of apprehension and nervousness about the accomplishment of team tasks (McCarthy et al., 2016; Parker & DeCotiis, 1983), and its impact on team- and individual-level creativity. Drawing on previous research on negative group affective tone and related studies (Collins, Lawrence, Troth, & Jordan, 2013; Rhee, 2007; Tsai, Chi, Grandey, & Fung, 2012), we theorize that team job-related anxiety, characterized as a socially constructed reality, exhibits an inverted U-shaped curvilinear relationship with team and individual creativity. Furthermore, we investigate a boundary condition for the relationships. As George and Zhou (2007) noted, a supportive work context enables employees to better translate their affective states into creative ideas and thus alters the influences of affective variables. Accordingly, we introduce the notion of team cooperativeness and expect that it would moderate the relationship between team job-related anxiety and creativity. Figure 1 presents our overall theoretical model.

2 | THEORY AND HYPOTHESES

2.1 | Team job-related anxiety

Job-related anxiety is a set of feelings of apprehension and nervousness about the accomplishment of job-related tasks (Cheng & McCarthy, 2018; Krannitz et al., 2015; Xie & Johns, 1995). The word

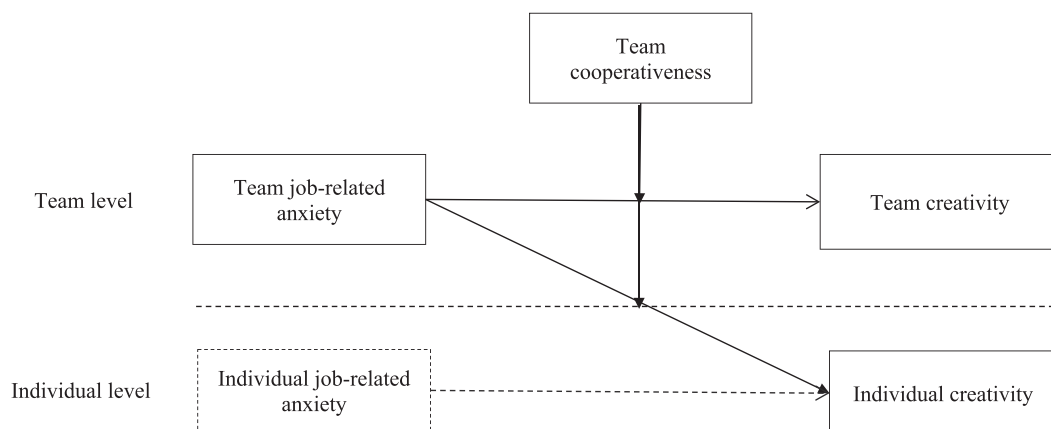


FIGURE 1 Research model

feeling in this definition emphasizes individuals' subjective awareness of their own uncomfortable and undesirable states. Weiss (2002) proposed multiple affective states within the "affect family," including mood, stress, and emotion (p. 23). Although these affective states overlap (i.e., they are all affective, and there is a feeling component among them), they differ in many ways. For example, moods and emotions differ in both intensity and duration—moods are less intense and last longer, whereas emotions are more intense and have shorter duration (Weiss, 2002). Although anxiety has been treated as a kind of negative mood (Krannitz et al., 2015), job-related anxiety is caused by job-specific factors, whereas a negative mood may not have a specific cause and is not necessarily the result of a person's job-specific tasks. Job-related anxiety is also different from stress (Cheng & McCarthy, 2018). Stress refers to the process by which external stressors lead to strained reactions through an individual's subjective interpretations (Bliese, Edwards, & Sonnentag, 2017), whereas job-related anxiety represents a strain symptom within the stress process (Sonnentag & Frese, 2003). Indeed, job-related anxiety represents a unique field of studies in organizational science (e.g., Cheng & McCarthy, 2018; McCarthy et al., 2016; Xie & Johns, 1995).

Although job-related anxiety is typically examined as an individual-level construct, team members may come to develop shared feelings of uneasiness and nervousness or team job-related anxiety (Barsade & Gibson, 1998; Cheng & McCarthy, 2018). According to the input-process-state-output model of group affective tone (Collins et al., 2013), team job-related anxiety is a collective state arising simultaneously from top-down and bottom-up processes (Kelly & Barsade, 2001; Kozlowski & Klein, 2000). For example, from a top-down perspective, team members are exposed to the same negative affective event, such as team task failure, and thus develop a shared state of job-related anxiety. Furthermore, from a bottom-up perspective, team members may form similar affective reactions via an emotional contagion mechanism (Barsade, 2002; George, 1990). When a team member expresses nervousness about completing team tasks, his/her anxiety may transfer to other team members, leading to a shared affective state—team job-related anxiety. Such emotional contagion processes among members could happen even unconsciously or unintentionally (Neumann & Strack, 2000). Indeed, research has suggested that collective affective states do exist at the team level or even at organizational level (e.g., Barsade, 2002; Bartel & Saavedra, 2000; Choi, Sung, Lee, & Cho, 2011; George, 1990; Knight, Menges, & Bruch, 2018).

We position team job-related anxiety as a referent-shift consensus compositional construct: (a) the referent of team job-related anxiety shifts from the individual to the team level, and (b) team job-related anxiety is meaningful when it is shared among team members (Chan, 1998; Chen et al., 2002). Moreover, we propose that team job-related anxiety is different from individual job-related anxiety because team job-related anxiety (a) is a collective phenomenon unfolding over and above individual experiences, (b) is explained by collective configurations and conditions that are common to team members (Collins et al., 2013), and (c) has antecedents and consequences distinct from individual job-related anxiety. Team job-related anxiety is also

different from negative team affective tone, defined as "consistent or homogeneous affective reactions within a group" (George, 1990, p. 108), because the latter describes a group's *general* negative affective state, whereas the former represents a *task-specific* negative team affective state.

2.2 | Team job-related anxiety and team creativity

Although researchers have not examined team job-related anxiety and team creativity, some have explored the influence of general negative team affective tone on team creativity. The preliminary evidence reveals that positive group affective tone generally benefits team performance and creativity, but the relationship between negative group affective tone and team creativity remains inconclusive (Knight & Eisenkraft, 2015). Spoor and Kelly (2004) and George and King (2007) suggested that negative group affective tone benefits team creativity because it motivates team members to identify team problems. Conversely, Rhee (2007) proposed that negative group affective tone inhibits team creativity because it induces team members' criticism about others' performance and incites the group to prematurely abort new ideas. Furthermore, Grawitch, Munz, and Kramer (2003) found no relationship between negative group affective tone and team creativity in an experimental study. These mixed findings suggest a need for a more comprehensive analysis of and more nonlinear thinking about the relationship between negative group affective states and team creativity.

Building on these studies, we propose that team job-related anxiety has an inverted U-shaped relationship with team creativity. Specifically, we posit that a moderate level of team job-related anxiety facilitates team creativity, whereas low and high levels diminish it. As team job-related anxiety increases from a low to a moderate level, the team will gradually realize that the current team task situation is problematic (McCarthy et al., 2016). As the increasing team job-related anxiety signals a problematic situation, team members will exchange information to identify and solve the problem (Spoor & Kelly, 2004), and those increased task-related communications subsequently could benefit team creativity (Gong, Kim, Lee, & Zhu, 2013). Team job-related anxiety may not only alert team members that "we need to do something now" but also propel the thought that "we need to do something together." As Spoor and Kelly (2004) noted, negative group affective states help foster collective actions toward enemies. Thus, as team job-related anxiety increases from a low to a moderate level, teams will become more integrated and conduct more collective activities (Knight & Eisenkraft, 2015), such as brainstorming, meeting, and discussion, all of which motivate collective effort to generate ideas and tackle team tasks (Weingart, Todorova, & Cronin, 2008).

However, when team job-related anxiety exceeds an optimal level, it may exert a negative influence on team creativity because it alters team communication and integration. High team job-related anxiety will start to engender a threat feeling. According to threat-rigidity theory (Staw, Sandelands, & Dutton, 1981), with such a feeling, teams seek consensus to respond to the problematic situation

rapidly. Teams would be likely to narrow down the attention span, engage in constricted information processing, become rigid in their responses, and rely more on formalized and routine procedures in operations (Rhee, 2007). Following this perspective, when team job-related anxiety increases from a moderate to a high level, instead of more thoughtful problem solving and openness to new ideas, communication among team members is restricted to complete the task in a rapid manner (e.g., through familiar methods). Additionally, as team job-related anxiety increases from a moderate to a high level, team social integration decreases. George (1990) found that when team members were at a high level of negative affective tone, they were less likely to perform prosocial behaviors. Rhee (2007) proposed that a high level of negative group affective tone induces critical evaluation among members, leading to more interpersonal conflict (Gamero, González-Romá, & Peiró, 2008). The reduced integration leads to less team creativity because members are not able to share and combine different ideas (Higgins, Qualls, & Couger, 1992). Taken together, we propose the following:

Hypothesis 1. Team job-related anxiety has an inverted U-shaped relationship with team creativity.

2.3 | Team job-related anxiety and individual creativity

In this study, we posit that team job-related anxiety influences individual creativity above and beyond an employee's own job-related anxiety (Janssen, 2004). As Bliese and Jex (2002) pointed out, "the group-level measure by virtue of being a shared perception can be considered more of an objective rating of the environment than can the individual-level assessment" (p. 271). Because team job-related anxiety represents a more reliable and accurate assessment of the team condition, it is more likely to trigger individual employees to engage in more activities or actions as a primary response to the problematic task situation (George & Zhou, 2007). Individual job-related anxiety, on the other hand, is subjective in nature; thus, it may not reflect the objective job situation and may therefore be seen as less credible (correct) when deciding one's reactions.

Specifically, we posit that intermediate levels of team job-related anxiety produce more individual creativity. First, an intermediate level of team job-related anxiety produces a sufficient level of task attention among team members (Zabelina, Saporta, & Beeman, 2015). A low level of team job-related anxiety means a shared perception that the situation is nonproblematic. Employees therefore see no reason to make changes by engaging in creativity; instead, they focus attention on routine and programmed activities (Eysenck, Derakshan, Santos, & Calvo, 2007). As team job-related anxiety increases from low to moderate levels, employees increasingly recognize the problems inherent in the tasks and are motivated to systematically address them. Because creativity requires the recognition of problems and efforts to address them (Zabelina et al., 2015), it is plausible to predict that individual creativity will increase as team job-related anxiety increases

from a low to a moderate level. However, when team job-related anxiety exceeds the optimal level, the high team-job related anxiety generates cognitive interference (Sarason, 1988), compromising problem identification and idea generation.

Second, creativity requires sustained effort (George & Zhou, 2007). We posit that a moderate level of team job-related anxiety motivates effort and increases engagement, both of which eventually lead to a higher level of individual creativity. As team job-related anxiety increases from a low to a moderate level, individual employees increasingly recognize the problematic situation, are more motivated to search for and process information systematically, and exert effort to resolve the problem, leading to greater individual creativity (Martin, Ward, Achee, & Wyer, 1993; Zhou & Hoever, 2014). However, when team job-related anxiety exceeds the optimal level, too much negative feeling will become a control precedence (Frijda, 1986). Employees have to engage in more emotion regulation activities such as relaxing to handle their negative feelings, decreasing their efforts to solve task problems, and limiting their production of creative solutions. All these would lead to a decrease in one's creativity effort. Finally, as team job-related anxiety exceeds the optimal level and further increases, conflict and mutual blame are more likely to occur (Choi & Cho, 2010), which, together with diffused responsibility in a team, should reduce individual employees' efforts to creatively resolve problems in the team. To sum up, we propose the following:

Hypothesis 2. Team job-related anxiety has an inverted U-shaped relationship with individual creativity, after controlling for an employee's own job-related anxiety.

2.4 | The moderating role of team cooperativeness

Knight and Eisenkraft (2015) noted that the influences of negative group affective tone depend on contextual factors. Previous theories and studies also indicated that the interpersonal effects of group affect varied as the context changed (De Dreu, West, Fischer, & MacCurtain, 2001; Tsai et al., 2012; van der Schalk et al., 2011). Building on this line of research, we posit that the positive effect of an intermediate level of team job-related anxiety on team creativity will be further strengthened when team members work in a cooperative manner.

Team cooperativeness refers to a team interaction pattern in which members share and exchange information in a timely manner and help one another to complete team tasks (Wageman, 1995). Under high cooperativeness, although members have their own assigned tasks, they understand each other's work and work together to complete the shared goals. As we posited earlier, members in teams with intermediate job-related anxiety exchange more task-related information and are more integrated. We propose that high team cooperativeness will contribute to the translation of exchanged information and integration into more team creativity. First, in teams with higher cooperativeness, an intermediate level of team job-related

anxiety will be more likely to trigger high-quality task-related team communication and will eventually produce more team creativity because team members have more knowledge about, and are more supportive of, one another's work (Beersma et al., 2003; Wageman, 1995). Second, the social integration elicited by an intermediate level of team job-related anxiety is more likely to be translated into team creativity in teams with higher cooperativeness because mutual trust and support among members in such teams will provide a psychologically safe environment for anxious members to generate ideas and solutions.

Conversely, when team cooperativeness is low, team members tend to cope more independently with team job-related anxiety. With weaker social support, the team's collective actions, triggered by intermediate team job-related anxiety, are less likely to be translated into team creativity. Moreover, low team cooperativeness reduces communication between team members and thus offers little opportunity to consider other members' perspectives (Kim & Shin, 2015). Given that considering others' perspectives can make proposed ideas more useful (Hoever, van Knippenberg, van Ginkel, & Barkema, 2012), teams with lower cooperativeness are less likely to foster useful creative ideas even at an intermediate level of job-related anxiety.

Hypothesis 3a. Team cooperativeness positively moderates the inverted U-shaped relationship between team job-related anxiety and team creativity, such that an intermediate level of team job-related anxiety is related to higher creativity in teams with higher cooperativeness.

Further, we posit that intermediate team job-related anxiety will motivate individual employees to generate more creative ideas or solutions in teams with higher cooperativeness. As George and Zhou (2007) noted, a supportive work context enables the positive effect of moderate negative moods on individual creativity because such a context reassures employees in negative moods that they will not be belittled for their attention to detail and that their proposed solutions will receive serious consideration. When an intermediate level of team job-related anxiety motivates individuals to generate solutions, team cooperativeness provides a creativity-supportive context that enables anxious individuals to generate better and more creative solutions (Baer & Oldham, 2006; van Knippenberg & Hirst, 2020). For example, developmental feedback in high cooperativeness teams provides anxious individuals with useful information and puts them into learning and improving mode. Under higher team cooperativeness, individuals engage in more information and perspective exchanges, which enhances the task-relevant knowledge of anxious individuals and helps translate these perspectives into useful solutions and insights for solving problems related to one's own tasks at hand (Gong, Cheung, Wang, & Huang, 2012). Mutual trust in high-cooperativeness teams gives anxious individuals confidence that they will not be unfairly blamed, motivating their efforts to generate creative ideas. In contrast, an intermediate level of team job-related anxiety will produce less individual creativity in less cooperative teams

because of a limited exchange of information and less support from teammates. To sum up, we propose the following:

Hypothesis 3b. Team cooperativeness positively moderates the inverted U-shaped relationship between team job-related anxiety and individual creativity, such that an intermediate level of team job-related anxiety is related to higher individual creativity in teams with higher cooperativeness.

3 | METHOD

3.1 | Sample and procedure

We conducted our study at a publicly listed high-technology firm in China, and we sampled all research and development (R&D) teams and member employees. R&D teams are the basic units for learning and knowledge creation in the high-tech field, and the creativity of R&D teams and employees is critical for company success. We initially contacted the company's HR director who provided basic information regarding all R&D teams, including the names of all team supervisors and members. Although the members in R&D teams may each have assigned individual tasks, they worked for the same project and to achieve a common goal.

We adopted a two-wave design to alleviate the potential reverse-causality concern as well as the common method bias concern. At Time 1, we sampled all 305 R&D employees and 65 team supervisors. These employees voluntarily responded to a questionnaire regarding their own job-related anxiety, team job-related anxiety, intrinsic motivation, creative self-efficacy, and demographic information. We asked team supervisors to report on team cooperativeness and their own demographic information. At Time 2, 2 months later, the corresponding team supervisor rated each team member's creativity and that of the team as a whole.

Finally, we obtained matched data from 290 R&D employees (response rate of 95%), nested in a total of 65 R&D teams. The average team size was 4.46 employees ($SD = 2.20$) and ranged from three to 10 members. As noted by the HR director, there were no subunits in any of the teams. Most R&D members were male (76%), with an average age of 27 ($SD = 3.07$) and an average length of work experience in their teams of 2.86 years ($SD = 2.41$). We used a 5-point Likert-type scale throughout the survey (1 = *totally disagree* to 5 = *totally agree*) unless otherwise noted.

3.2 | Measures

3.2.1 | Team job-related anxiety

We started with Parker and DeCotiis' (1983) five-item job-related anxiety scale, which was later used by Xie and Johns (1995). We adapted the items using a referent-shift model to capture the team's collective perception of job-related anxiety. Sample items included "in

our team, we have felt fidgety or nervous as a result of our tasks," and "our team's tasks get to us more than they should" ($\alpha = .88$).

We then computed the within-group inter-rater agreement and ICC values. Team job-related anxiety had an average R_{wg} value of .84, well above the rule of thumb for R_{wg} of .60 (James, 1982). The ICC (1) value of team job-related anxiety was .10, which was within the typical range of .05–.20 (Bliese, 2000); and the ICC (2) value of team job-related anxiety was .32, lower than the .60 cutoff point recommended by Glick (1985) but comparable with coefficients in Koopmann, Lanaj, Wang, Zhou, and Shi (2016) and Simons and Peterson (2000), wherein ICC (2) value both was .28. The ICC (2) value was somewhat low, but the aggregation of team members' ratings was still acceptable given that R_{wg} indicated a strong within-group agreement. The combination of the ICC (1) value and the small average team size ($n = 4.46$) in our sample resulted in a low ICC (2) value (Bliese, 1998). Because we sampled all team members, team size could not be further increased. According to Koopmann et al. (2016), our finding pattern suggests that our low ICC (2) value for team job-related anxiety was not driven by disagreement (i.e., random error) in team member ratings but rather by subtle differences in rank orders, such as poor discrimination (LeBreton & Senter, 2008). Given that all teams were from the same organization, organizational influences may have had a large effect on team job-related anxiety, limiting between-group variability. Hence, on the basis of the above reasoning as well as the acceptable R_{wg} and ICC (1) values, we proceeded to aggregate member-rated team job-related anxiety to the team level.¹

3.2.2 | Team creativity

We measured the leader-rated team creativity with the three-item scale from Oldham and Cummings (1996). The team leaders who participated in the study evaluated team creativity by considering the team as a unit. Sample items were "the team's work is creative" and "the team's work is original and practical" ($\alpha = .78$).

3.2.3 | Individual creativity

We used Madjar, Greenberg, and Chen's (2011) six-item creativity scale to measure individual creativity. The team leaders evaluated each employee's creativity. The original scale had radical and incremental components, and confirmatory factor analysis showed that the two-factor model ($\chi^2 = 21.89$, $df = 8$, root mean square error of approximation [RMSEA] = .08, comparative fit index [CFI] = .98, Tucker-Lewis index [TLI] = .97) was a better fit than the one-factor model ($\chi^2 = 35.04$, $df = 9$, RMSEA = .10, CFI = .97, TLI = .95). However, because the fit of the one-factor model was acceptable, the two components were highly correlated in our study ($r = .72$, $p < .001$); and because our research was not intended to investigate whether

team job-related anxiety had differing effects on radical creativity versus incremental creativity, we combined the two dimensions to obtain an overall assessment of individual creativity. The Cronbach's α was .86. Additional regression results showed that the main effect and moderation effects did not change across different measurements of creativity (i.e., radical creativity, incremental creativity, and a combination of the two).

3.2.4 | Team cooperativeness

We used Wageman's (1995) three-item scale to measure team cooperativeness. We deleted one item from the original scale because the item ("not taking calls outside one's own territory") was not appropriate for our participants. Because the team leaders were in charge of distributing tasks, allocating resources, and evaluating the performance of team members and the whole team, and because they had had necessary information regarding their teams, we asked them to evaluate the extent of cooperativeness in their teams. Sample items were "they help each other without being asked" and "they keep in touch with each other during the day." ($\alpha = .75$).

3.2.5 | Control variables

When performing team-level analysis, we controlled for team size and standard deviation of team job-related anxiety. Team size has been regarded as a significant factor that underlies team outcomes (Anderson, Potočník, & Zhou, 2014). Given that the ICC (2) value of team job-related anxiety is not high, we included the standard deviation of team job-related anxiety to control for the possibility that the variance of team job-related anxiety affected both team and individual creativity and thus confounded the relationship to be examined in this study (Koopmann et al., 2016).

When performing cross-level analysis, we also controlled for individual-level covariates or confounding factors that might be related to individual creativity (i.e., intrinsic motivation, creative self-efficacy, employee job-related anxiety, and squared employee job-related anxiety). Previous research has shown that intrinsic motivation and creative self-efficacy are significant predictors of employee creativity (see Liu, Jiang, Shalley, Keem, & Zhou, 2016, for a meta-analytic review); thus, we controlled those two variables. We measured *intrinsic motivation* using Gagné et al.'s (2010) three-item scale. Sample items were "I enjoy this work very much" and "I have fun doing my job" ($\alpha = .90$). We measured *creative self-efficacy* with Tierney and Farmer's (2002) three-item scale. Sample items were "I have confidence in my ability to solve problems creatively" and "I feel that I am good at generating novel ideas" ($\alpha = .88$). Meanwhile, to examine the effect of team level job-related anxiety on individual creativity, we included individual level job-related anxiety and squared individual job-related anxiety to control for its effect on individual creativity (Bliese & Jex, 2002). We measured *employee job-related anxiety* using Parker and DeCotiis' (1983) five-item anxiety scale. Example items

¹We also controlled for team variance in job-related anxiety in all analyses. We thank the editor and one anonymous reviewer for providing this suggestion.

were "I have felt fidgety or nervous as a result of my task" and "there are lots of times when my tasks drive me right up the wall" ($\alpha = .87$).

3.3 | Statistical analyses

We used stepwise regression in SPSS 21.0 to investigate the relationships on a team level (i.e., Hypotheses 1 and 3a). Team job-related anxiety and team cooperativeness were grand-mean centered before calculating the quadratic term and the interaction term. We conducted multilevel path analysis in Mplus 6.0 (Muthén & Muthén, 1998–2010) to test Hypotheses 2 and 3b to account for the nested structure of the data (Preacher, Zyphur, & Zhang, 2010). Multilevel path analysis decomposes the variance of a Level-1 variable into a within component (within-group variance) and a between component (between-group variance). Relationships between these variance components can be modeled at each level through the specification of structural relationships. In comparison with the hierarchical linear modeling approach, a multilevel path model is more appropriate for testing multilevel relationships because it avoids the potential problem of conflating the between- and within-group relationships (Sun, Zhang, Qi, & Chen, 2012).

4 | RESULTS

Table 1 presents the means, standard deviations, and correlation coefficients among the variables. The results show that employee job-related anxiety was not significantly related to individual creativity ($r = -.03, p > .05$).

Before testing our hypotheses, we first conducted multilevel confirmatory factor analysis in Mplus to examine the discriminant validity between the variables (i.e., team cooperativeness, team creativity, employee-rated team job-related anxiety, employee job-related

anxiety, intrinsic motivation, creative self-efficacy, and individual creativity). The results show that the seven-factor model ($\chi^2 = 511.93, df = 207, RMSEA = .07, CFI = .90, TLI = .88$) was an acceptable fit to the data. All the observed items had significant loadings on their respective latent variables. We further compared our hypothesized measurement model with two alternatives: (1) a six-factor model with employee job-related anxiety and team job-related anxiety loading on one factor and the other variables loading on their own respective factors, which provided a worse fit than our hypothesized model ($\chi^2 = 610.03, df = 211, RMSEA = .08, CFI = .87, TLI = .85; \Delta\chi^2 = 98.10, \Delta df = 4, p < .001$); and (2) a six-factor model with team job-related anxiety and team cooperativeness loading on one factor and the other variables loading on their own respective factors, which also provided a worse fit than our hypothesized model ($\chi^2 = 576.27.03, df = 208, RMSEA = .08, CFI = .88, TLI = .86; \Delta\chi^2 = 64.34, \Delta df = 3, p < .001$). These results confirmed the discriminant validity of all constructs in our model.

4.1 | Hypotheses testing

Table 2 shows the stepwise regression on the team level. We first entered the team size, team job-related anxiety, team cooperativeness, and standard deviation of team job-related anxiety into the model to predict team creativity (Model 1a). The results of Model 1a showed that none of the controls were significantly related to team creativity. We then entered the quadratic term of team job-related anxiety into the model (Model 1b). The results showed that the squared team job-related anxiety had a significant negative effect on team creativity ($b = -.60, p < .05$), thus supporting our Hypothesis 1. Meanwhile, the interaction plot also demonstrated a curvilinear relationship between team job-related anxiety and team creativity as prediction (see Figure 2). We further entered two interaction terms (i.e., team cooperativeness interacted with team job-related anxiety,

TABLE 1 Reliability, means, standard deviations, and intercorrelations among variables

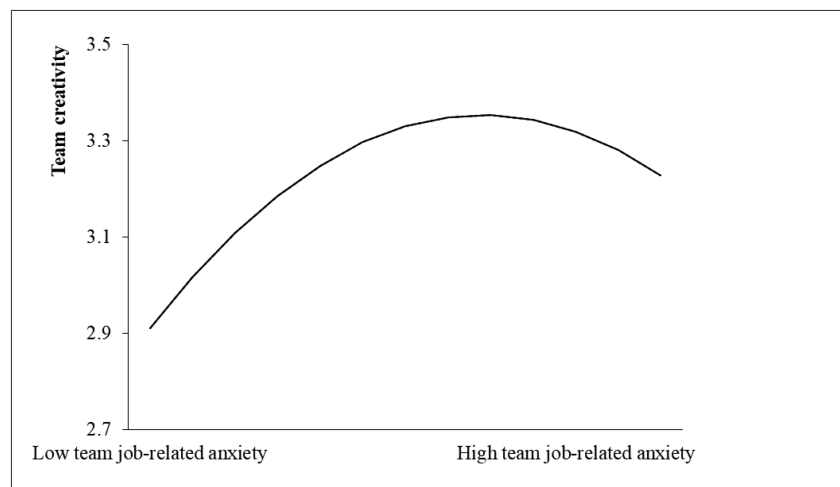
Variables	Mean	SD	1	2	3	4	5
Team level							
1. Team size	4.46	2.20					
2. Team job-related anxiety	2.86	.44	-.05	(.88)			
3. Standard deviation of team job-related anxiety	.60	.27	.33***	-.05			
4. Team cooperativeness	4.00	.54	-.14	.02	-.11	(.75)	
5. Team creativity	3.15	.49	.05	.19	.18	-.16	(.78)
Individual level							
1. Intrinsic motivation	3.02	.68	(.90)				
2. Creative self-efficacy	3.47	.60	.22***	(.88)			
3. Employee job-related anxiety	2.81	.78	-.26***	.02	(.87)		
4. Individual creativity	3.30	.57	.00	.09	-.03	(.86)	

Note: Team creativity and individual creativity were rated at Time 2 by team leaders; all other variables were rated at Time 1. The numbers in parentheses refer to the reliability (Cronbach α) of each variable. We can only calculate the reliability of latent variables (e.g., team job-related anxiety).

*** $p < .001$.

TABLE 2 Stepwise regression results for Hypotheses 1 and 3a

Independent variable	Team creativity		
	Model 1a	Model 1b	Model 1c
Team size	-.00 (.03)	-.03 (.03)	-.02 (.03)
Team cooperativeness	-.14 (.11)	-.10 (.11)	-.01 (.15)
Team job-related anxiety	.22 (.14)	.24* (.13)	.23 (.13)
Standard deviation of team job-related anxiety	.34 (.24)	.27 (.23)	.30 (.24)
Squared team job-related anxiety		-.60** (.25)	-.54** (.26)
Team job-related anxiety × Team cooperativeness			.14 (.27)
Squared team job-related anxiety × Team cooperativeness			-.48 (.49)
<i>F</i>	1.56	2.48**	2.02*
<i>R</i> ²	.09	.17	.20
Adjust <i>R</i> ²	.03	.10	.10
ΔR^2	.09	.08**	.02

** $p < .05$ (two-tailed). * $p < .10$.**FIGURE 2** The curvilinear relationship between team job-related anxiety and team creativity

and team cooperativeness interacted with squared team job-related anxiety) into the model (Model 1c). The results show that the interaction term between team cooperativeness and squared team job-related anxiety had no significant effect on team creativity ($b = -.48$, $p > .05$), failing to support Hypothesis 3a.

Table 3 presents the results of the multilevel path analysis. Before performing the multilevel path analysis, we group-mean centered all individual-level variables (i.e., employee job-related anxiety, intrinsic motivation, and creative self-efficacy) and grand-mean centered team-level variables (i.e., team job-related anxiety and team cooperativeness). The results showed that squared team job-related anxiety had a significant negative effect on individual creativity ($b = -.08$, $p < .05$, 95% CI $[-.16, -.01]$), supporting our Hypothesis 2. Meanwhile, the interaction plot also showed a curvilinear relationship between team job-related anxiety and individual creativity (see Figure 3).

The results in Table 3 also showed a significant moderation effect of team cooperativeness on the curvilinear relationship between team job-related anxiety and individual creativity ($b = -.09$, $p < .01$, 95% CI

$[-.16, -.02]$), supporting Hypothesis 3b. An inspection of the interaction plot (see Figure 4) revealed that the relationship between team job-related anxiety and individual creativity followed an inverted U-shaped function under high cooperation condition. Under the condition of an intermediate level of team job-related anxiety, employees in teams with high cooperativeness would exhibit greater creativity than those in teams with low cooperativeness, further supporting Hypothesis 3b.

5 | DISCUSSION

Our primary goal is to examine the effect of team job-related anxiety on both team- and individual-level creativity. Consistent with our prediction, an intermediate level of team job-related anxiety is found to be related to higher team creativity and individual creativity. When team job-related anxiety exceeds the optimal level, team and individual creativity decrease. Furthermore, the intermediate level of team job-related anxiety fosters more individual employee creativity in

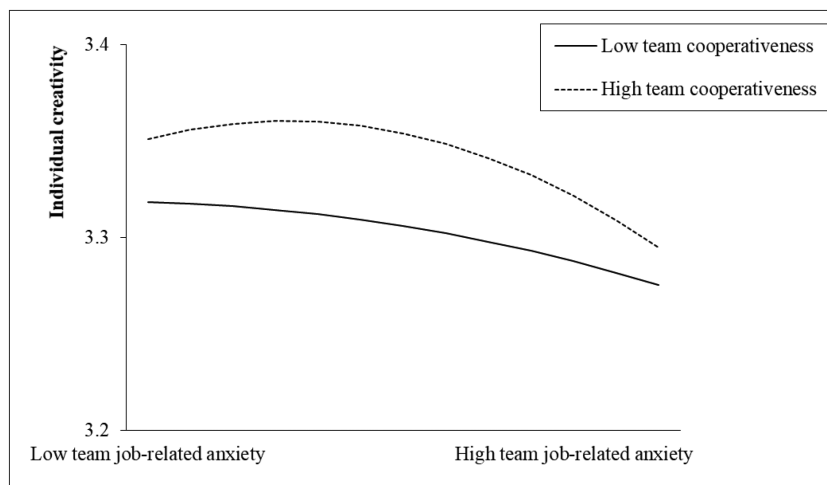
TABLE 3 Multiple-level analysis results for Hypotheses 2 and 3b

Independent variable	Estimate	SE	p value	95% CI LL	95% CI UL
Team level					
Team size	-.01	.03	.63	-.07	.04
Team job-related anxiety	-.05	.05	.36	-.15	.06
Standard deviation of team job-related anxiety	.19	.16	.24	-.13	.50
Squared team job-related anxiety	-.08**	.04	.04	-.16	-.01
Team cooperativeness	.03	.06	.61	-.09	.15
Team job-related anxiety × Team cooperativeness	-.01	.04	.76	-.10	.07
Squared team job-related anxiety × Team cooperativeness	-.09***	.04	.01	-.16	-.02
Individual level					
Employee job-related anxiety	-.03	.04	.45	-.12	.05
Squared employee job-related anxiety	.07	.04	.06	-.00	.13
Intrinsic motivation	.05	.05	.37	-.06	.15
Creative self-efficacy	.07	.05	.14	-.02	.17
Employee team job-related anxiety ^a	.04	.03	.20	-.02	.10
Squared employee team job-related anxiety	-.04**	.02	.01	-.07	-.01

^aEmployee team job-related anxiety refers to the within-group variance of employee-rated team job-related anxiety.

*** $p < .01$ (two-tailed).

** $p < .05$.

**FIGURE 3** The curvilinear relationship between team job-related anxiety and individual creativity**FIGURE 4** Curvilinear interaction of team job-related anxiety and team cooperativeness on individual creativity

teams with high cooperativeness, as compared with those in teams with low cooperativeness.

We did not find support for Hypothesis 3a (i.e., team cooperativeness moderates the curvilinear relationship between team job-related anxiety and team creativity). One potential explanation is that the generation of team creativity requires more complex interactions among contextual, social, and member characteristics (Baer & Oldham, 2006; Woodman, Sawyer, & Griffin, 1993). Inter-team cooperation or unit level support could be more critical contextual factors for team creativity. On the other hand, team context is more critical for and immediately relevant to the amplification of the effect of team job-related anxiety on individual creativity. Another potential explanation is that the positive role of team cooperativeness is substituted by an intermediate level of team job-related anxiety. As noted, both team job-related anxiety and team cooperativeness could foster collective and frequent interactions among team members. When intermediate level of team job-related anxiety motivates the extent of team interaction to an adequate level to generate team creativity, team cooperativeness may become less influential, resulting in a nonsignificant moderating effect of team cooperativeness.

5.1 | Theoretical contributions

5.1.1 | Contribution to multilevel perspective on job-related anxiety

Several researchers have proposed the theoretical possibility that the phenomena of anxiety can occur at more than one level of analysis. For example, Cheng and McCarthy (2018) argued that individual employees could transfer their anxiety feelings to other group member and that the resulting shared group-level anxiety would affect team processes and outputs. To our knowledge, the present study represents one of the first attempts to both justify the notion of team job-related anxiety and systematically test its effects in organizations. As with other studies that investigate one phenomenon across multiple levels (Chen et al., 2002; George & James, 1993), the present study also examines the assumption of homology in theoretical models of job-related anxiety (i.e., job-related anxiety operates similarly across level of analysis; Cheng & McCarthy, 2018). The results of this study mainly reveal three major dissimilarities between team-level and individual-level job-related anxiety, as we elaborate below.

First, team job-related anxiety predicts team creativity, albeit in a nonlinear fashion, whereas employee job-related anxiety does not predict individual creativity. One theoretical insight is that employee job-related anxiety has less influence on individual members because it is more subjective, less reliable, and thus less relied on. Team job-related anxiety, on the other hand, is seen as more objective and accurate and thus acts more strongly as a social context in shaping team creativity. Second, team job-related anxiety predicts individual creativity, whereas individual job-related anxiety does not. Again, the insight is that team job-related anxiety as a shared reality is more influential to individual members.

Third, team cooperativeness moderates the effect of team job-related anxiety on individual creativity but not team creativity. As discussed earlier, it is possible that inter-team or unit contextual variables (e.g., interteam cooperation) are more critical for the team-level effect but that team context (e.g., team cooperativeness) is more critical for the effect on individual creativity. By adopting a multilevel approach to explore the job-related anxiety-creativity relationship, the results of the present study contribute to a more comprehensive understanding of job-related anxiety, an important and pervasive phenomenon in organizations.

5.1.2 | Contribution to research on negative group affective tone

Our findings that team job-related anxiety has an inverted U-shaped relationship with team creativity contribute to the literature on negative group affective tone. Recently, scholars have begun to explore affect as a collective property of groups and have shown that both positive and negative group affective tones have significant influence on group processes and outcomes, such as performance and creativity (Rhee, 2007). Although positive group affective tone has been found to enhance creativity (George & King, 2007; Spoor & Kelly, 2004), the effect of negative group affective tone on creativity remains unclear (Grawitch et al., 2003; Rhee, 2007). We found that team job-related anxiety, serving as a task-specific negative group affective state, has a curvilinear relationship with team creativity. This finding suggests that negative group affective tone may have both positive and negative effects on team creativity, depending on whether it exceeds the optimal level of a team (Knight & Eisenkraft, 2015).

5.1.3 | Contribution to research on context

Our research emphasizes the necessity of considering team context when investigating relationship between job-related anxiety and employee creativity (Bliese & Jex, 2002). Our study examines how multiple work-context features (i.e., team job-related anxiety and team cooperativeness) interact to affect creativity. This is consistent with Johns (2006), who argued that context serves as situational opportunities and constraints that affect the occurrence of organizational behavior. Specifically, team job-related anxiety signals a more objective and salient situational feature over employees' own feelings in triggering their creative behaviors. Furthermore, team cooperativeness provides resources and opportunities that allow individual team members to generate more creativity under an intermediate level of team job-related anxiety. Note that although both team job-related anxiety and team cooperativeness are important, they affect individual creativity differently. This finding further reveals that different contextual factors could affect organizational behaviors in multiple ways (Johns, 2006). Our research thus provides support to the essential role of context in the job-related anxiety research in particular and organizational behavior research in general.

5.1.4 | Contribution to research on creativity

This study contributes to multilevel theoretical development and research on creativity. Scholars have called for both cross-level and multilevel approaches to advance the current understanding of creativity (Anderson et al., 2014). Zhou and Shalley (2007) proposed that a prime goal for multilevel theorizing of creativity is to examine “whether the same predictor predicts creativity at different levels in the same way” (p. 351). Research using an individual-level approach suggests that job-related anxiety hardly predicts creativity (Janssen, 2004). This is also revealed with our results that individual job-related anxiety has neither linear nor curvilinear relationship with individual creativity. However, our results suggest that team job-related anxiety predicts team creativity. This finding indicates that the nomological network, especially the immediate antecedents, of creativity may vary depending on the level of analysis (Chen & Bliese, 2002). Our research thus contributes to the development of multilevel theories of creativity.

5.2 | Practical implications

First, our findings suggest to practitioners that the team's state of job-related anxiety matters to creativity. Practitioners should be aware that an intermediate level of team job-related anxiety foster more creativity and therefore take action to keep the group's job-related anxiety at that level. When team job-related anxiety is at a high (or a low) level, practitioners may need to initiate managerial interventions to reduce (or enhance) it. For example, when team job-related anxiety is low, managers could organize meetings in which team members need to share their task difficulties and imagine the worse outcomes to increase the level of team job-related anxiety and help teams identify problems. When managers realize that the level of team job-related anxiety is high, they can conduct some anxiety management activities with team members, such as mindfulness meditation (Kabat-Zinn, 2009).

In addition, our findings show that individual employees in teams with higher levels of cooperativeness are more creative at an intermediate level of team job-related anxiety. This suggests that managers could take action to promote team cooperativeness such as formulating interdependent tasks, setting team rewards, or encouraging information sharing between team members. By so doing, the team will reap the greatest benefit of individual creativity from an intermediate level of team job-related anxiety.

5.3 | Limitations and directions for future research

Our research has notable limitations that suggest useful future research. First, we conducted the study in China, a collectivistic society where people are socially bound together and obligated to act in a collective fashion (Oyserman, Coon, & Kimmelmeier, 2002). In this culture, employees are more likely to adjust their actions to cope with

group emotions or feelings while downplaying their own individual emotions or feelings (Markus & Kitayama, 1991). This indicates that, in a collectivistic culture, team job-related anxiety will be more salient in influencing individual behaviors than individuals' own feelings. We encourage further examinations of our model in various cultural contexts. Additionally, our participants all came from the R&D teams of a high-tech company. Future research should examine to what extent our conclusions could be generalized to teams and organizations in other industries.

Second, although we show that team job-related anxiety has an inverted U-shaped effect on team and individual creativity, we have not empirically examined specific mechanisms involved. Future research could further explore *how* team job-related anxiety affects team and individual creativity. Future research may examine whether team job-related anxiety increases creativity by encouraging team members to engage in creative processes such as problem identification and information searching (Harvey & Kou, 2013). Third, it would be interesting to examine whether low-to-intermediate and intermediate-to-high team job-related anxiety may have an asymmetric relationship with team creativity. For example, the rate of increase in team creativity from a low to an intermediate level of team job-related anxiety may be smaller than the rate of decrease in team creativity from an intermediate to a high level of team job-related anxiety. This is because individuals tend to pay more attention to negativity—also called the “negativity bias” (Rozin & Royzman, 2001, p. 296). Such examination would provide more nuances about the curvilinear relationship between team job-related anxiety and team creativity.

Finally, although intermediate team job-related anxiety contributes the most to team and individual creativity, it remains unclear how supervisors can influence job-related anxiety so that it reaches an intermediate level. Answering this question will require researchers to investigate the antecedents of team job-related anxiety or find new methods to measure anxiety. For example, researchers may measure neural excitation in the reticular activating system (Gardner & Cummings, 1988) when studying job-related anxiety.

6 | CONCLUSION

Whether and when team job-related anxiety affects creativity has received little attention. Taking a multilevel approach, we advance the current understanding by showing the effects of team job-related anxiety on both team and individual creativity. As a more objective and reliable signal of a problematic condition, team job-related anxiety exhibits a stronger influence on individual creativity than individual job-related anxiety. Meanwhile, the relationship between job-related anxiety and creativity is an inverted U-shaped at the team level but nonsignificant at the individual level. These results contribute to the development of multilevel theories of job-related anxiety and creativity. We hope our work will stimulate more interest and further research into job-related anxiety and creativity.

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