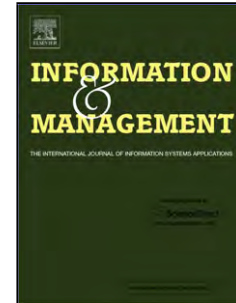


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Role Stressors, Job Satisfaction, and Employee Creativity: The Cross-level Moderating Role of Social Media Use within Teams

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Highlights

- We develop a two-level, first-stage moderated mediation model.
- Job satisfaction partially mediates the role ambiguity-employee creativity linkage.
- Task-oriented social media use affects the role conflict-job satisfaction linkage.
- Relationship-oriented social media use also moderates this linkage.
- Two types of social media use moderate the intervening role of job satisfaction.

Abstract

This study sheds light on how role stressors influence employee creativity by jointly exploring the mediating mechanism and contextual factors affecting these relationships. Drawing from the transactional theory of stress, we consider job satisfaction to be a mediator that represents employees' attitudinal responses to stressors. We also consider social media use within teams to be a moderator that affects employees' stress appraisal. Specifically, we distinguish between task- and

relationship-oriented social media use. We propose a multilevel moderated mediation model to depict the nomological network. Results of a survey of 359 employees in 56 organizational teams suggest that two social media usage patterns differentially moderate the relationships between role stressors and job satisfaction as well as the indirect relationships between role stressors and employee creativity through job satisfaction. We also discuss the theoretical and practical implications.

Keywords: employee creativity, role ambiguity, role conflict, job satisfaction, task-oriented social media use, relationship-oriented social media use

1. Introduction

Organizations increasingly consider team collaboration and employee creativity as two critical contributors to competitiveness, growth, and success (e.g., Hiller et al. 2006; Shalley et al. 2004). For instance, Google, Microsoft, and Apple encourage project team members to develop novel and useful ideas. Meanwhile, complex and uncertain competitive environments are often characterized by numerous work stressors. Managers and scholars thus start to consider the influences of work stressors when formulating strategies for boosting employee creativity (Leung et al. 2011; Woisetschläger et al. 2016). Given that the interdependent nature of teamwork requires team members to interact on the basis of role responsibilities (Savelsbergh et al. 2012; Windeler et al. 2017), researchers have perceived the salience of role stressors (i.e., stressful work conditions involving job roles) (Wong et al. 2007). However, empirical studies find variously that linkages between role stressors and employee creativity can be positive (e.g., Coelho et al. 2011; Woisetschläger et al. 2016), negative (e.g., Montani et al. 2017), or even nonlinear (e.g., Leung et al. 2011; Wang et al. 2011), thus failing to provide consistent guidance for strategy making.

To reconcile this inconsistency in the literature, scholars have utilized the challenge-hindrance stressor framework to clarify the multidimensional nature of role stressors (Eatough et al. 2011; Fried et al. 2008). Role stressors are composed of two facets: (1) role ambiguity (RA), referring to vagueness associated with goals and means to fulfil a role; and (2) role conflict (RC), defined as incompatibility between requirements for a role (Rizzo et al. 1970). Unfortunately, current knowledge about how various types of role stressors affect employee creativity remains fragmented and limited. First, the underlying mechanisms that link role stressors to employee creativity are largely underexplored (Coelho et al. 2011; Montani et al. 2017; Wang et al. 2011). Addressing this issue is practically and theoretically important, because it will help us to comprehend how employees perform creatively when confronted with role stressors and echoes calls for exploring mechanisms through which role stressors affect outcomes (Gilboa et al. 2008). The organizational behavior literature has started to provide explanations from the psychological perspective and proposes attitudinal reactions as an intermediate process accounting for how job stressors induce behavioral reactions (Albion et al. 2008; Bettencourt and Brown 2003; Webster et al. 2010). Montani et al. (2017) also imply that role stressors may impair employees' generation of new ideas by arousing negative attitudes. Nevertheless, few empirical studies have examined the mediating effect of attitudes on the role stressor–employee creativity linkage.

Furthermore, we have limited insights into contextual conditions that influence the intervening role of attitudes in the role stressor–employee creativity linkage. Unearthing these conditions would provide evidence for developing managerial suggestions to help employees form positive attitudes toward role stressors and enact creativity accordingly. The transactional theory of stress is particularly suitable to guide research in this area, since it purports that processes through which individuals appraise stressors and make attitudinal and behavioral reactions are contingent upon contexts (Lazarus and Folkman 1984). In

accordance with this logic, social support from supervisors or coworkers has been confirmed to shape employees' work attitudes by interacting with stressors (Kawai and Mohr 2015; Lawrence and Callan 2011). Social support can amplify the tendency of employees to perceive stressors as a challenge and mitigate the tendency of employees to perceive stressors as a hindrance (Hon et al. 2013).

With the proliferation of information technology (IT) in the workplace, researchers have noted that social support can be exchanged through employees' interpersonal interactions in IT-enabled work environments (Lin et al. 2015; Luo et al. 2018). Social media applications designed for enterprises (e.g., microblogs and wikis) have attracted significant academic interest as they become emerging channels for intraorganizational communication (Davison and Ou 2017; Leonardi 2014; Turco 2016). Information systems (IS) scholars have recognized the completion of tasks and the maintenance of relationships as the two primary usages of social media in the workplace (Mäntymäki and Riemer 2016). They also imply that different usages may provide various kinds of social support, each of which may influence employees' performance (Ali-Hassan et al. 2015; Lu et al. 2015). Nonetheless, empirical evidence supporting the idea that social media use can moderate the effects of stressors remains scarce (Ding et al. 2019). Given that teams often constitute the social context in which employees conduct interpersonal interactions (Cao and Ali 2018), comprehend their job (Drach- Zahavy and Freund 2007) and enact creativity (Hirst et al. 2009), we assume that examining how social media use within teams influences employees' stress appraisal processes is warranted.

To close these gaps, we focus on job satisfaction among attitudinal variables because this attitude reflects employees' overall feelings toward a job (Diestel et al. 2014). Job satisfaction is easily affected by role stressors (LeRouge et al. 2006) and may facilitate employees' creative thinking (Shalley et al. 2004). Previous studies on relationships between

role stressors and employees' workplace behaviors (e.g., turnover or in-role job performance) have confirmed that job satisfaction can serve as a mediator (Eatough et al. 2011; Fried et al. 2008; Webster et al. 2010). Nevertheless, how role stressors affect employee creativity through job satisfaction has rarely been investigated. We further conceptualize social media use within teams – the moderator – as a team-level construct because the interdependence among individual social media use gives rise to collective phenomena (Burton-Jones and Gallivan 2007; Negoita et al. 2018). Scholars have realized that multilevel theorizing can offer new insights into team members' perceptions on and responses to role stressors (Savelsbergh et al. 2012). In addition, as a mediation effect may vary across different contexts (Edwards and Lambert 2007; Preacher et al. 2007), investigations into conditional indirect effects have emerged in empirical studies (e.g., Lepine et al. 2016; Zhang et al. 2014). As such, we propose the following research questions: *(1) What role, if any, does job satisfaction play in mediating relationships between role stressors and employee creativity? (2) To what extent does social media use exert cross-level moderating effects on linkages between role stressors and job satisfaction? (3) To what extent are indirect relationships between role stressors and employee creativity contingent on social media use?*

Drawing on the transactional theory of stress, we propose a two-level, first-stage moderated mediation model to address the aforementioned questions. Specifically, we assume that employees appraise role stressors and then sequentially make direct attitudinal reactions (job satisfaction) and indirect behavioral reactions (employee creativity). Moreover, social media use within teams is posited to affect employees' appraisal processes that lead to direct attitudinal reactions (i.e., first-stage moderation) and indirect relationships between role stressors and employee creativity through job satisfaction. This study contributes to the literature in three ways. First, we add to the stress and creativity literature by empirically exploring attitudinal mechanisms that connect role stressors with employee creativity in team

contexts. Second, we are among the first to examine IT-related contextual conditions that influence how individuals appraise stressors in a multilevel model, which extends the transactional theory of stress. This study is an empirical attempt to test the assertion of McFarland and Ployhart (2015) that social media provide a context to shape employees' cognition, affection, and behavior, which echoes the call for investigating how digitization alters the way employees think and behave regarding job demands (Aral et al. 2013; Reyt and Wiesenfeld 2014; Tarafdar et al. 2007). Third, this study sets itself apart from prior social media research by pondering role stress issues in the workplace, thereby advancing existing explorations for the consequences of social media use in enterprises. Our findings help team managers in designing social media governance strategies to leverage role stressors for improving job satisfaction and employee creativity.

2. Theoretical Background and Hypothesis Development

2.1 Transactional theory of stress

The transactional theory of stress contends that how individuals react to stressors that relate to environmental conditions emotionally, attitudinally, and behaviorally depends on their cognitive appraisal of stressors (Lazarus and Folkman 1984). This perspective heralds individuals' appraisal of stressors as a psychological mechanism that links stressors to outcomes (Webster et al. 2011). To interpret the workplace stressors perceived by employees, the transactional theory of stress has spawned the challenge–hindrance stressor framework (Pearsall et al. 2009; Webster et al. 2010; Webster et al. 2011). A basic tenet is that employees appraise a situation that is likely to provide opportunities for future rewards and personal growth as a challenge and a situation that has the potential to thwart the attainment of personal goals and development as a hindrance (Lazarus and Folkman 1984; Pearsall et al. 2009). A stressor can be a combination of challenge and hindrance, if it promotes some aspects of the job but restrains other aspects (Webster et al. 2011).

Challenge and hindrance stressors have been affirmed to exert differential effects on various outcomes, such as employee engagement, motivation, work attitudes, and work performance (Pearsall et al. 2009; Webster et al. 2010; Webster et al. 2011). Recent studies have begun to examine another critical assertion of this theory, such that conditional factors can alter processes of stress appraisal (Lazarus and Folkman 1984). By applying this theory in organizational settings, they have identified some factors that can magnify the possibility that employees see the positive side of challenge stressors and reduce the tendency of employees to appraise hindrance stressors as detrimental, such as leadership as a second-level construct in the multilevel model (Lepine et al. 2016; Zhang et al. 2014). Nevertheless, explorations for potential moderators under the framework of stressor appraisal are still limited (Lepine et al. 2016). Even without an explicit intention to test the transactional theory of stress, other scholars have empirically verified that social support in the workplace can influence employees' psychological reactions to stressors (Kawai and Mohr 2015; Lawrence and Callan 2011). As such, social support has the potential to moderate individuals' processes of stress appraisal.

2.2 Role stressors and employee creativity

Role stressors refer to stressful job conditions that involve job roles (Wong et al. 2007). Roles include a set of expectations on responsibilities applied to a position (Kawai and Mohr 2015; Tarafdar et al. 2007). Employees expect their roles to be clear and unified; otherwise, they may encounter role stressors that are manifested by *RA* and *RC*. *RA* refers to the fuzziness regarding role expectations, including insufficient information to state how to achieve work goals and evaluate performances (Rizzo et al. 1970). *RC* points to the incongruent expectations, including conflicts between role demands and focal members' internal values and personal resources (e.g., time and energy). *RC* also emerges when team leaders or teammates convey incompatible demands (Rizzo et al. 1970).

RA and RC can simultaneously be interpreted as a hindrance or a challenge to varying degrees (Gilboa et al. 2008; Webster et al. 2011). However, most scholars view them primarily as a hindrance (Leung et al. 2011; Moore 2000; Tubre and Collins 2000) and reveal their unfavorable outcomes in the workplace, including employees' negative emotions (e.g., strain, anxiety, and burnout), job dissatisfaction, turnover intention, withdrawal behavior, and ultimately poor in-role job performance (Boyd et al. 2009; Gilboa et al. 2008; Kawai and Mohr 2015; LeRouge et al. 2006; McKnight et al. 2009; Moore 2000). Nonetheless, scholars have pointed out the necessity of exploring how role stressors relate to other performance-related outcomes in addition to general job performance (Eatough et al. 2011; Wang et al. 2011). Employee creativity is increasingly becoming a key indicator of job performance because employees are often expected to tackle nonroutine tasks in creative ways (Leung et al. 2011).

Employee creativity refers to the production of novel and useful ideas concerning products, services, practices, or processes in organizations (Farmer et al. 2003). Employee creativity is critical for organizational growth, success, and competition (Sacramento et al. 2013). It also forms the foundation of team creativity (Gong et al. 2013; Hirst et al. 2009). Scholars have perceived employee creativity as a function of individual factors, contextual factors, and their interactions (Shalley et al. 2004). For instance, employee creativity can be achieved when individuals with a high promotion focus work under high job demands (Sacramento et al. 2013). In the team setting, team climate acts as a determinant of employee creativity (Gong et al. 2013).

Role stressors are among the most salient work stressors for organizational teamwork because team members rely on defined roles to coordinate efforts (Savelsbergh et al. 2012; Windeler et al. 2017). Despite this, our understanding of how role stressors affect employee creativity remains limited and elusive. Creativity researchers have not reached consensus on

whether RA and RC are a hindrance or a challenge; thus, they report positive, negative, or insignificant effects of RA and RC on employee creativity (Coelho et al. 2011; Webster et al. 2011; Woisetschlager et al. 2016). Some scholars resolve this inconsistency by investigating intervening variables, such as intrinsic motivation (Coelho et al. 2011), organizational commitment (Montani et al. 2017), and creative self-efficacy (Wang et al. 2011); however, they almost completely neglect employees' stress appraisal processes.

Having observed the nonlinear relationship between role stressors and employee creativity, scholars also realize the necessity of examining conditional factors (Byron et al. 2010; Leung et al. 2011; Wang et al. 2011). Prior research has verified the moderating role of individual personality (e.g., tolerance of ambiguity, Wang et al. 2011) and organizational conditions (e.g., social support, Leung et al. 2011), but has paid scant attention to the team context despite the fact that creative employees work in teams (Hirst et al. 2009). Furthermore, only a few studies have examined how intervening roles of intermediary mechanisms in the role stressor-employee creativity linkage (e.g., organizational commitment) vary contingent upon contexts (e.g., leader-member exchange) (Montani et al. 2017). In sum, underlying mechanisms through which role stressors influence employee creativity and contextual factors that affect these mechanisms are worth further exploration.

2.3 Social media in enterprise

Social media in enterprise refers to web-based platforms into which a bundle of applications, such as blogs, wikis, microblogs, social tagging tools, and social networking sites, are integrated to facilitate interactive dialogue between employees (McFarland and Ployhart 2015; Treem and Leonardi 2012). As a lightweight means for communication, these applications afford four distinct possibilities for action (i.e., affordances). First, *visibility* implies that employees can view coworkers' behaviors, knowledge, preferences, and communication network connections. Second, *persistence* exists when employees are allowed

to access information in the original form at any time. Third, *editability* refers to the possibility that employees modify information before others view it. Fourth, *association* reflects connections that employees establish with coworkers or information (Rice et al. 2017; Treem and Leonardi 2012). Conversely, traditional organizational communication tools merely foster some of these affordances. For instance, email does well in affording editability and persistence but lacks visibility from the standpoint of third parties (Leonardi et al. 2013; Treem and Leonardi 2012).

Being characterized by these affordances, social media are designed to support information exchange and socialization (Leonardi et al. 2013; Treem and Leonardi 2012), being not only work platforms but also social tools (Ali-Hassan et al. 2015; Leftheriotis and Giannakos 2014; Lu et al. 2015; Luo et al. 2018; Mäntymäki and Riemer 2016). Responding to the call for a granular conceptualization of technology use in the specific research context (Ali-Hassan et al. 2015; Kuegler et al. 2015), scholars have differentiated between the two usage patterns of social media in enterprises based on functions of self-managed teams (Ding et al. 2015; Hiller et al. 2006). Specifically, *task-oriented social media (TSM) use* includes assigning tasks, monitoring work processes, and discussing and solving problems, whereas *relationship-oriented social media (RSM) use* refers to the informal talk aiming at maintaining interpersonal relationships and fostering social cohesion (Ding et al. 2015; Mäntymäki and Riemer 2016).

2.3.1 Consequences of social media use in the workplace

Although scholars have shown concerns about the dark side of social media in enterprise (e.g., the threat of technology-related addictions to employees' productivity) (Moqbel and Kock 2018; Turel and Serenko 2012), a positive view on this technology dominates in the literature (Aral et al. 2013). It contends that using social media in teamwork facilitates individuals' agility (Cai et al. 2018), task and innovative performance (Ali-Hassan et al.

2015; Kuegler et al. 2015), and team-level coordination, achievement, and innovation (Cao and Ali 2018; He and Yang 2016; Leonardi 2015). Three primary underlying mechanisms are identified. The perspective of knowledge management depicts how TSM use improves knowledge exchange and then promotes performance (Kuegler et al. 2015; Leonardi 2014; Leonardi 2015; Mäntymäki and Riemer 2016). The perspective of social relationships (e.g., social capital) argues that TSM and RSM use can enable employees to perform better by reinforcing instrumental and expressive ties among work partners (Ali-Hassan et al. 2015; Lu et al. 2015; Luo et al. 2018). The third is a combination of the above mechanisms, suggesting that social ties enhanced by social media use can benefit performance by smoothing knowledge management activities (Davison et al. 2018; Kwahk and Park 2016).

In addition, intraorganizational social media use also influences employees' cognitions, psychological states, and work attitudes (Cai et al. 2018; Lin et al. 2015; Moqbel and Kock 2018; van Zoonen et al. 2017). For instance, Cai et al. (2018) assert that social media use at work benefits employee agility through influences of psychological meaningfulness, availability, and safety. Lin et al. (2015) suggest that individuals can perceive social support on social media platforms. van Zoonen et al. (2017) contend that using social media can invoke employees' exhaustion if too much interruption is generated. However, findings in this line of research are insufficient. Furthermore, only a few studies have tested the contingent role of social media use in effects of stressors (Ding et al. 2019; Ding et al. 2015). They focus on employees' behavioral responses to stressors and explain that social media use accentuates the positive effect of challenge stressors but attenuates the negative effect of hindrance stressors on employee innovation. Nonetheless, how employees' stress appraisal processes and attitudinal reactions to stressors are influenced by social media use is unclear.

2.3.2 Conceptualization of social media use as a team-level construct

We justify the conceptualization of team-level social media use by considering the nature of teamwork and the feature of social media-enabled interpersonal interactions in organizational settings. Teamwork requires team members to work interdependently and interact closely to achieve collective goals (Savelsbergh et al. 2012; Windeler et al. 2017). Social media platforms are able to serve tasks that require intensive interdependence, because they present an open, interactive context in which rich two-way communication occurs between any of the members at any time (McFarland and Ployhart 2015). Team members exchange messages and feedback backwards and forwards, which means that their individual use of social media for communication and collaboration are mutually dependent. IS scholars have asserted that the interdependence among individual IS use is a precondition for collective IS use to be a meaningful construct (Burton-Jones and Gallivan 2007; Negoita et al. 2018).

With regard to how collective IS use emerges, Leonardi (2013) indicates that when team members appropriate features of collaborative tools in similar ways, they can exchange information more broadly and deeply, and achieve better outcomes that move toward collective goals. Accordingly, we deem that to improve collaboration quality, team members need to gradually perceive and actualize affordances of multiple social media tools in a homogeneous manner. Team-level social media use emerges from team members' homogeneous use of social media for task-related and relationship-related purposes (Burton-Jones and Gallivan 2007).

IS research has already incorporated team-level IT use into research models (Cao and Ali 2018; He and Yang 2016). For instance, Cao and Ali (2018) demonstrate how team-level social media use facilitates the formation of transactive memory system. Furthermore, McFarland and Ployhart (2015) underline the role of social media use as a context where

employees' cognition, attitude, and behavior are shaped by their interactions with coworkers occurring on social media platforms. This offers a new angle to understand the cross-level influence of social media in enterprises with respect to individual work outcomes.

2.4 Mediating role of job satisfaction

Despite inconsistencies regarding the role stressor-employee creativity linkage in the literature, we first state direct relationships in our research context to form a foundation for proposing a mediating mechanism. Within organizational teams, RA can involve circumstances when a team member does not know which responsibilities to take, which performance criteria to follow, and with whom to coordinate efforts for task completion (Windeler et al. 2017). Team members who are confronted with RA may feel that they lack information to guide their work behaviors (Tubre and Collins 2000) and may accordingly spend time, energy, and mental resources to acquire sufficient work information (Byron et al. 2010). However, such resources could otherwise be devoted to other tasks, such as developing creative ideas. Montani et al. (2017) term this phenomenon as the resource-depleting effect of stressors, and regard it as a notable cause of decreased employee creativity.

To explore mediating mechanisms from the attitudinal perspective, as recommended by prior studies (e.g., Albion et al. 2008; Webster et al. 2010), we propose job satisfaction as a mediator for two reasons. First, job satisfaction refers to an employee's positive attitude arising from comprehensively evaluating multiple facets of a job, such as working conditions, career development, and coworkers (Diestel et al. 2014). It is thus highly representative among work-related attitudes. Second, Beehr and Newman (1978) state that the simplest and most obvious psychological reaction to work stressors is dissatisfaction with the job. Similarly, job satisfaction has been validated to be easily affected by work stressors and relates to consequences including less employee turnover, better job performance, and

organizational citizenship behavior (Eatough et al. 2011; Fried et al. 2008; Kawai and Mohr 2015). However, prior research has rarely explored whether job satisfaction mediates the role stressor-employee creativity linkage (Coelho et al. 2011; Wang et al. 2011).

We posit RA to be negatively related to job satisfaction. When team members repeatedly receive unclear role expectations from their work partners, they tend to deem that their investment of personal resources (e.g., time and energy) in resolving RA is unending and rewardless (Boyd et al. 2009). They may appraise RA as insurmountable work puzzles (i.e., hindrances) and then experience job-related strain with all the consequent negative emotions (e.g., frustration, anxiety, and burnout) (Pearsall et al. 2009). These negative emotions are likely to impair job satisfaction by prompting team members to disengage from team interactions rather than enjoy working conditions and relationships with coworkers (Kawai and Mohr 2015). Moreover, team members may view RA as a type of mismatching between roles and themselves (DeRue and Morgeson 2007), causing them to sense fewer opportunities to achieve personal development. This means that RA may also jeopardize job satisfaction involving personal growth (Eatough et al. 2011; LeRouge et al. 2006).

The link between job satisfaction and employee creativity is generally proposed as being positive. Team members' creative work behaviors involve observing the status quo of teams, identifying problems, and developing novel and useful solutions, all of which are time- and energy-consuming. Job satisfaction, as an important psychological impetus, can enhance team members' willingness to proactively devote time, energy, and expertise to undertake creative work (Fried et al. 2008; Woisetschläger et al. 2016). Positive affection that accompanies job satisfaction may also release individuals' cognitive resources and stimulate creative thinking (Shalley et al. 2004). Conversely, job dissatisfaction may impede employee creativity by causing team members to psychologically and behaviorally withdraw from current work (Bettencourt and Brown 2003). The intervening role of job satisfaction in the

effects of work stressors on employee performance and turnover has been discussed in various organizational contexts (Crede et al. 2007; Eatough et al. 2011; Fried et al. 2008). Similarly, we posit that team members who experience higher levels of RA will feel lower levels of job satisfaction and, in turn, will be more reluctant to enact creativity. Taken together, we hypothesize that:

H1a. Job satisfaction mediates the negative relationship between role ambiguity and employee creativity.

Within organizational teams, RC may involve situations in which a team member is required to satisfy incompatible demands from supervisors or teammates, even though s/he lacks adequate resources to execute all these tasks (Windeler et al. 2017). A few studies have posited that each role stressor may have both challenge and hindrance components (e.g., Webster et al. 2011) and further implied that RC may be different from RA in the proportion of the hindrance component (e.g., Gilboa et al. 2008; Ritter et al. 2016). However, both earlier meta-analyses (e.g., Eatough et al. 2011; Fried et al. 2008; Tubre and Collins 2000) and recent empirical studies (e.g., Montani et al. 2017; Windeler et al. 2017) predominantly emphasize the homogeneous nature of RA and RC as a hindrance that can lead to employees' strain and inferior job performance. This study thus follows the dominant view to assume that RC, similar to RA, is a hindrance.

We propose that RC has a negative direct relationship with employee creativity. Team members who are confronted with RC may feel confused about priorities over task assignments (Tubre and Collins 2000). Resolving such problems triggered by RC will also elicit the resource-depleting effect, which means that team members have to devote resources (e.g., time and energy) to cope with unfavorable situations rather than develop creative ideas (Byron et al. 2010). Team members are thus less likely to enact creativity (Montani et al. 2017).

Through a stress appraisal process, which is similar to that of RA, RC is posited to be negatively related to job satisfaction. After appraising RC as a hindrance, team members may feel that there is nothing they can do to get rid of the predicament and accordingly experience negative emotions (e.g., frustration, anxiety, and burnout) (Boyd et al. 2009; Pearsall et al. 2009). These negative emotions either cause team members to disengage from interpersonal interactions with teammates (Kawai and Mohr 2015) or hinder team members from perceiving opportunities for personal growth (DeRue and Morgeson 2007), thereby reduces job satisfaction in employees (Eatough et al. 2011; LeRouge et al. 2006).

As we have discussed before, job satisfaction is proposed to be positively related to employee creativity by stimulating individuals' willingness of enacting creativity (Woisetschläger et al. 2016) and releasing individuals' cognitive resources (Shalley et al. 2004). Taken together, team members who experience higher levels of RC tend to feel lower levels of job satisfaction. As a consequence, they will be less likely to engage in creative work behaviors. Thus, we propose that:

H1b. Job satisfaction mediates the negative relationship between role conflict and employee creativity.

2.5 Moderating role of social media use within teams

According to the transactional theory of stress, a team member's stress appraisal processes are assumed to be influenced by the extent to which the whole team uses social media. By developing a two-level, first-stage moderated mediation model (Edwards and Lambert 2007), we suppose that: (1) social media use within teams can moderate role stressor-job satisfaction linkages (the first-stage moderation); and (2) indirect effects of role stressors on employee creativity through job satisfaction vary as a function of social media use within teams due to first-stage moderation. Specifically, given that social support from the organization, supervisors, or coworkers is critical to reconcile the effects of work stressors (Kawai and

Mohr 2015; Lawrence and Callan 2011; Wallace et al. 2009), we follow Ding et al. (2019) to position social media as an online context in which social support is exchanged through interpersonal interactions and propose that such a context can affect how individuals appraise and attitudinally respond to role stressors. Our arguments and hypotheses are presented below.

TSM use is manifested by open online conversations among team members for the purposes of setting out task goals, informing task assignments, checking work progresses, and discussing and solving problems, including posting, commenting, and forwarding task-related messages (Ding et al. 2015; Leonardi 2014). It facilitates the exchange of task-related information within teams (Kuegler et al. 2015). Because of the visibility affordance, team members are able to view work interactions and coordination flows between their work partners and themselves, as well as to understand where to locate needed expertise (Leonardi 2015; Leonardi et al. 2013). This may lead team members to perceive that informational support within teams (i.e., information resources bolstering the task completion, such as advice, experience, and knowledge) is available and sufficient (Ding et al. 2019). The persistence affordance enables team members to retrieve recorded information anytime and anywhere, which may further enhance their perceived informational support (Treem and Leonardi 2012). In addition, through the association affordance, team members can establish work connections (i.e., instrumental ties) with each other to identify and solve problems together (Rice et al. 2017). This may provide a conduit for interpersonally exchanging informational support (Lu et al. 2015; Treem and Leonardi 2012).

Within a team with the high level of TSM use, team members are more likely to benefit from interpersonal knowledge exchange and receive informational support. Their confidence in their personal competence to resolve undesirable situations may be heightened by the psychological availability of information resources (Cai et al. 2018; Lin et al. 2015). Thus,

team members tend to appraise unclear or incongruent role expectations (i.e., RA and RC) as being less insurmountable and are less likely to have negative emotions (Kawai and Mohr 2015). Their job satisfaction may not be affected by the existence of RA and RC.

Furthermore, task-oriented interactions such as receiving feedback can direct team members' attention toward tasks, leading team members to be less concerned about strain or negative emotions attributed to RA and RC (Hon et al. 2013). Consequently, RA and RC are less likely to threaten individuals' positive work attitudes (e.g., job satisfaction). Additional evidence is provided by the job demand-resource model, which suggests that job resources can buffer against adverse effects of stressful job demands on employees' attitudes and behaviors (van Zoonen et al. 2017).

We further expect indirect effects of role stressors on employee creativity through job satisfaction to be contingent upon the level of TSM use. When the level of TSM use is high, team members will tend to not view RA and RC as hindrances that engender lower job satisfaction, and they can better protect their motivation to engage in creative behaviors from being eroded. By contrast, when the level of TSM use is low, team members may lack informational support to buffer negative effects of RA and RC, causing them to feel dissatisfied with their jobs and become disengaged from creative work. Thus, we posit that:

H2. Task-oriented social media use positively moderates the relationship of role ambiguity (H2a) and role conflict (H2b) with job satisfaction such that the relationship is less negative when the level of task-oriented social media use is high.

H3. Task-oriented social media use positively moderates the indirect relationship of role ambiguity (H3a) and role conflict (H3b) with employee creativity through job satisfaction such that the relationship is less negative when the level of task-oriented social media use is high.

RSM use within teams refers to informal communication among team members in the form of posting, commenting, and forwarding information for social purposes (e.g., personal experiences, emotions, and opinions on general affairs) (Ding et al. 2015; Luo et al. 2018). It does not directly contribute to work activities but aims at maintaining the social fabric of teams by acting as a “social lubricant” (Leonardi et al. 2013; Mäntymäki and Riemer 2016). By taking advantage of the association affordance of social media, team members who engage in relationship-oriented interactions can establish and maintain social connections (i.e., expressive ties) with those who share common interests, minds, or goals (Leonardi et al. 2013). Gradually, they may conceive of each other as close partners or in-group members (Luo et al. 2018) and utilize these social networks as channels for exchanging emotional support, such as caring, encouragement, consolation, and empathy (Ali-Hassan et al. 2015; Lu et al. 2015; Luo et al. 2018). Davison et al. (2018) also deem that social media can serve as a way of fostering harmony among team members.

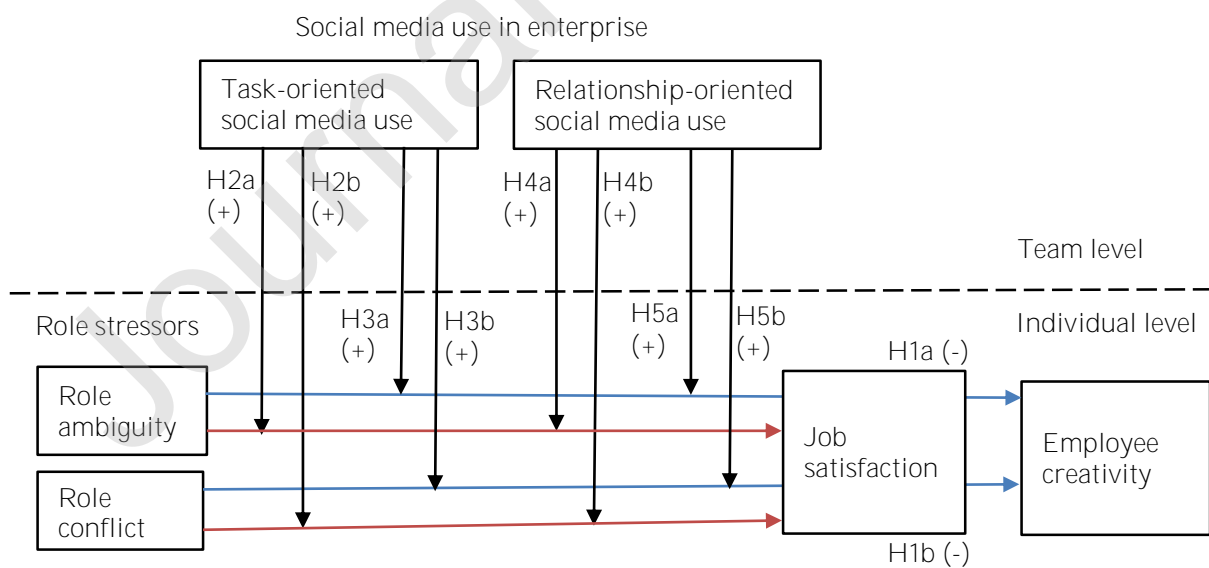
Within a team characterized by the high level of RSM use, team members could benefit from social cohesion and emotional support by leveraging such important resources to cope with stressful work conditions (Ding et al. 2019; Lazarus and Folkman 1984). For team members who are confronted with ambiguous or incongruent role expectations, receiving encouragement and comfort from teammates has the potential to alleviate their job-related strain and negative emotions (e.g., frustration, anxiety, and dissatisfaction) engendered by RA and RC (Kawai and Mohr 2015; Lawrence and Callan 2011). Schepers et al. (2016) also argue that encouragement from leaders can inspire team members’ constructive perspectives on undesirable work situations. Accordingly, team members are less likely to see the negative side of RA and RC, with the result that the destructive influence of RA and RC on job satisfaction will be less pronounced.

Furthermore, RSM use within teams is also posited to be able to reconcile the indirect effects of role stressors on employee creativity through job satisfaction. When the level of RSM use is high, team members' job satisfaction may not be reduced by role stressors, thereby protecting their willingness to enact creativity from being damaged. In contrast, within a team characterized by low levels of RSM use, team members tend to retain their appraisal of RA and RC as hindrance stressors, thereby feeling less motivated to engage in creative work because of their low level of job satisfaction. Thus, we propose that:

H4. Relationship-oriented social media use positively moderates the relationship of role ambiguity (H4a) and role conflict (H4b) with job satisfaction such that the relationship is less negative when the level of relationship-oriented social media use is high.

H5. Relationship-oriented social media use positively moderates the indirect relationship of role ambiguity (H5a) and role conflict (H5b) with employee creativity through job satisfaction such that the relationship is less negative when the level of relationship-oriented social media use is high.

Figure 1 presents our conceptual model.



H1a and H1b denote the mediating effect

Note: The blue line represents the indirect relationship between role stressors and employee creativity through job satisfaction. The red line represents the relationship between role stressors and job satisfaction.

Figure 1. Research model

3. Research Design and Methodology

3.1 Sample and procedure

To test the hypotheses, we adopted the survey method due to its strength in capturing the essence of field work without sacrificing generality. We chose Chinese firms as research sites because Chinese professionals' emphasis on social relationships and their preference for social technology have attracted significant academic curiosity (e.g., Cai et al. 2018; Davison et al. 2018; Lu et al. 2015; Luo et al. 2018). Consistent with previous research (Cao and Ali 2018), we sampled from multiple industries. Through MBA/executive MBA alumni, we initially identified 57 companies that adopt social media for teamwork. We sent them invitation letters, explaining our research purpose, listing sampling criteria, guaranteeing data confidentiality, and promising to send a report as feedback. They all designated coordinators (generally upper-level managers) to help us identify eligible teams for data collection. We distributed questionnaires to respondents individually and guaranteed their anonymity. This study considers private and public social media platforms adopted by sample firms. Private platforms, such as DingTalk, Jingao, Mingdao, and Kdweibo, offer services exclusively for collaboration within teams. Public sites (e.g., WeChat, Weibo, wikis, and blogs) are originally personal communication media but are increasingly used in professional lives. Prior to the large-scale questionnaire distribution, we conducted a pilot study to elucidate how frequently team members use social media and other communication modes at work (see Appendix A).

We received 359 responses from 57 teams. After eliminating incomplete responses and teams that returned less than three completed questionnaires, we obtained a sample of 334 employees from 56 teams (i.e., 56 companies). The team size ranged from 5 to 30 members

(mean = 14.10, SD = 6.07). The average team age was 45.9 months (SD = 25.21 months).

The sampled teams represented the following functions: production (5), research and development (7), sales and marketing (30), consulting (8), finance (4), and others (2).

Following Armstrong and Overton (1977), we ensured that nonresponse bias was not a critical issue in this study because the results of two-tailed *t*-tests indicated no significant difference between the early (the first 25%) and late (the last 25%) respondents on demographic variables (e.g., work experience). Table 1 presents the demographic information of the sample.

By providing written instructions, we reminded respondents to answer the questionnaire based on their work practices and social media use. They were asked to rate the extent to which they agree with statements about the individual-level constructs (i.e., role stressors, job satisfaction, and employee creativity). The team-level constructs (i.e., social media use), as the main study variables that we shared with another research project, had been assessed by 401 team members from these 56 identified teams three months previously. Two justifications can support our methodology. First, although respondents in these two surveys were not completely identical, their opinions about team-level social media use are assumed to be homogeneous because when working together, they tend to adopt a similar manner to appropriate features of social media and interpret effectiveness of these tools (Leonardi 2013; Pearsall et al. 2009). Second, social media provide a context for open communication (McFarland and Ployhart 2015). Mitchell and James (2001) argue that contextual factors (e.g., team climate) are relatively constant. Thus, relative to the average team age (45.9 months), we assume that the much shorter time interval of three months is incapable of causing notable changes in social media use practices across two surveys (DeSanctis and Poole 1994).

Table 1. Demographic information

Measures	Items	Freq.	%	Measures	Items	Freq.	%
Individual				Firm			
Gender	Male	149	44.6	Firm age	<5 years	24	7.2
	Female	185	55.4		5-10 years (<11)	87	26.0
Age	<=25 years old	66	19.8	11-25 years (<26)	178	53.3	
	26-30 years old	172	51.5	>=26 years	45	13.5	
	31-40 years old	86	25.7	Firm size	<100 people	50	15.0
	>40 years old	10	3.0		101-300 people	43	12.9
Level of education	College or below	53	15.9	301-500 people	33	9.9	
	Bachelor	201	60.1	501-1000 people	56	16.8	
Work experience	Master or above	80	24.0	1001-2000 people	61	18.3	
	<1 year	55	16.5	>2000 people	91	27.2	
	1-2 years (<3)	82	24.6	Firm ownership	State-owned enterprise	120	35.9
	3-4 years (<5)	90	26.9		Private enterprise	150	44.9
	5-6 years (<7)	40	12.0		Foreign-owned enterprise	22	6.6
>=7 years	67	20.1	Public organization		42	12.6	
				Industry type *	Manufacturing	88	26.3
					Information technology	32	9.6
					Finance and banking	104	31.1
					Education	21	6.3
					Commercial service	64	19.2
					Public service	25	7.5

Note: In this study, the manufacturing industry engages in the production of automobiles, household electrical applications, machines, instruments, and food. The information technology industry includes computer hardware, software, and Internet firms. The finance and banking industry includes banks, insurance companies, security companies, and institutional investors. The education industry includes training institutions, research institutions, and academies. The commercial service industry includes law firms, consulting firms, intermediary agencies, catering industry, and tourist industry. The public service industry includes healthcare industry, public administration, and social groups.

3.2 Measurement development

The questionnaire was adapted from existing literature (see Appendix B). Following the back translation technique (Brislin 1980), we developed Chinese scales by translating the English version and then hired a professional translator unfamiliar with this study to translate the Chinese items back to English. We observed no semantic discrepancy between the translated English version and the original, suggesting that the Chinese items accurately reflected the original English meaning. To ensure face/content validity, we invited one IS professor and three professionals from the consulting industry to review and critique the

items. All measures used a 5-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”).

Role ambiguity and role conflict were measured with items adapted to the team context from Rizzo et al. (1970). Measures for RA were reverse coded, which manifested the connotation of role clarity. We measured **job satisfaction** with five items adapted from Diestel et al. (2014) to consider various aspects, such as satisfaction with working conditions, team management, career opportunities, teammates, and immediate supervisor.

Employee creativity was assessed by employees themselves with a four-item scale adapted from Farmer et al. (2003). This scale is particularly suitable for mirroring the Chinese perspective of employee creativity. Similar to prior studies (e.g., Ali-Hassan et al. 2015; Montani et al. 2017), we chose the self-report measurement for the following two main reasons: (1) objective measures are generally hard to capture; (2) the self-rating method is as reliable as ratings from supervisors or peers given that employees have better understanding about the details regarding their work and innovative practices (Montani et al. 2017).

We measured **social media use within teams** (i.e., TSM and RSM) as the extent to which team members collectively use social media for the purpose of achieving tasks and maintaining relationships. We adopted measurement items from Ding et al. (2015), which originated from the adaptation of Hiller et al.’s (2006) scale to the social media context. According to Hiller et al. (2006), task behaviors (i.e., planning, organizing, and problem-solving) and relationship behaviors (i.e., support, consideration, and development) are the two main types of face-to-face interactions among self-managed team members.

Controls: As suggested by previous research (e.g., Farmer et al. 2003; Leung et al. 2011; Montani et al. 2017), we used employee gender, age, level of education, and work experience as controls for employee creativity. We also controlled for team size and team age at the team level, because they may influence creative processes within teams (Gong et al. 2013).

4. Data Analysis and Results

4.1 Data aggregation

The team-level constructs, TSM use, and RSM use can be derived indirectly by aggregating individual responses. We justified the appropriateness of data aggregation by assessing the inter-rater agreement index (r_{wg}) (James et al. 1984) and the intraclass correlation coefficients (ICCs) (Bliese 2000). Results verify that the mean of r_{wg} values of TSM use and RSM use were 0.863 and 0.833, respectively, which was above the threshold of 0.70 and indicated the consensus of individual perceptions within the teams. Moreover, we calculated ICC(1) and ICC(2) to estimate the group-level variance components of variables and their reliability. The ICC(1) values that exceeded 0.10 were ideal (LeBreton and Senter 2008), whereas the recommended threshold of ICC(2) values was 0.60 (Bliese 2000). For TSM use, ICC(1) = 0.24, ICC(2) = 0.68, and $F = 2.876$ ($p < 0.01$). For RSM use, ICC(1) = 0.13, ICC(2) = 0.48, and $F = 1.960$ ($p < 0.05$). Although the ICC(2) value of RSM use was lower than 0.60, the F values associated with ICCs were all significant, indicating that within-group variances were significantly smaller than between-group variances. Hence, data aggregation can be validated.

4.2 Measurement model

We first tested the validity and reliability of measurement scales. Through a scale purification exercise, we eliminated items whose factor loadings were below the cutoff value of 0.60. Table 2 illustrates that Cronbach's alpha and composite reliability scores exceeded the threshold for exploratory research of 0.70, validating the construct reliability and internal consistency (Fornell and Larcker 1981). All factor loadings were above the recommended value of 0.70, and the average variance extracted (AVE) scores were higher than 0.50, which indicated good convergent validity (Fornell and Larcker 1981). Table 4 provides the descriptive statistics and zero-order correlations among study and control variables, which

shows the acceptable discriminant validity: the square roots of AVE scores were greater than the correlations between constructs.

Following previous research (e.g., Lepine et al. 2016), we also conducted a series of confirmatory factor analyses to examine whether our measurement model captured distinct constructs. The expected six-factor model (including RA, RC, job satisfaction, employee creativity, TSM use, and RSM use) was acceptable ($\chi^2 = 1199.752$, $df = 441$, $RMSEA = 0.072$, $CFI = 0.920$, $TLI = 0.910$, and $SRMR = 0.050$). The results of chi-square difference tests of several nested models also demonstrate that the six-factor model (Model A) better fitted the dataset than other models (See Table 3), also validating the discriminant validity of constructs.

Given that the correlation between TSM use and RSM use was higher than a benchmark value of 0.60, we also tested multicollinearity by calculating the variance inflation factor (VIF) values of constructs. Given that VIF values, ranging from 1.087 to 2.574, did not exceed the cutoff value of 5.0 (Kutner et al. 2004), multicollinearity is not considered to be a significant problem in this study.

Table 2. Results of measure validity and reliability

Construct	Number of items	Loadings	Cronbach's alpha	Composite reliability	AVE
RA	5	0.795–0.886	0.909	0.933	0.735
RC	6	0.711–0.834	0.871	0.903	0.610
JSA	5	0.810–0.891	0.904	0.929	0.929
ECR	4	0.880–0.912	0.919	0.943	0.805
TSM use	7	0.801–0.932	0.959	0.966	0.804
RSM use	5	0.833–0.896	0.917	0.938	0.752

Notes: RA, role ambiguity; RC, role conflict; JSA, job satisfaction; ECR, employee creativity; TSM use, task-oriented social media use; RSM use, relationship-oriented social media use

Table 3. Fit statistics from measurement model comparison

Model	$\chi^2(df)$	RMSEA	CFI	TLI	SRMR	$\Delta\chi^2$
Model A	1199.75 (441)	0.072	0.920	0.910	0.050	
Model B	1989.85 (446)	0.102	0.830	0.810	0.094	790.10***
Model C	2170.01 (450)	0.107	0.809	0.790	0.095	970.26***
Model D	2959.15 (453)	0.129	0.722	0.696	0.113	1759.40***

Model E	5719.51 (456)	0.186	0.42	0.37	0.140	4519.76***
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Notes: *p < 0.05; **p < 0.01; ***p < 0.001. All models were compared with the full measurement model.

Model A = full measurement model; Model B = RA and RC load on one factor, whereas other constructs represent separate factors; Model C = RA and RC load on one factor, TSM use and RSM use load on another factor, and other constructs represent separate factors; Model D = RA and RC load on first factor, TSM use and RSM use load on second factor, and other constructs load on third factor; Model E = all items load on one factor.

Table 4. Means, standard deviation (SD), and correlations of study variables

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
Level 1: employee														
1. Gender	0.45	0.50	NA											
2. Age	2.12	0.75	0.128	NA										
3. Education level	2.08	0.63	0.001	0.163	NA									
4. Work experience	2.95	1.35	0.049	0.483	0.195	NA								
5. RA	2.06	0.63	-0.061	-0.132	0.039	-0.102	0.735							
6. RC	3.43	0.72	-	-	-0.139	0.030	-0.256	0.610						
7. JSA	3.53	0.74	-	-0.104	-0.162	-0.111	-0.453	0.210	0.929					
8. ECR	3.58	0.66	0.024	0.012	-0.077	-	-0.497	0.384	0.419	0.805				
Level 2: team														
9. Team size	14.10	6.07	0.023	-	0.014	-0.017	-	-0.016	0.107	0.052	NA			
10. Team age (month)	45.90	25.21	0.023	0.034	0.301	0.406	-0.125	0.034	0.117	0.035	0.191	NA		
11. TSM use	3.79	0.43	-	0.007	-0.140	-0.012	-	0.066	0.044	0.021	-	-0.031	0.804	
12. RSM use	3.96	0.33	-	0.024	-0.112	-0.017	-0.123	0.018	0.074	-0.017	-0.116	0.032	0.613	0.752

Notes: All variables were presented at their appropriate levels. For correlations at Level 1, n = 334; for correlations at Level 2, n = 56; and for cross-level correlations, Level 2 data were disaggregated to Level 1, n = 334. Numbers in bold type in the diagonal row are square roots of AVE.

Gender is a dummy variable, 0 = female, and 1 = male. Age was divided as four classes. The education level was divided into three classes. Work experience was divided into five classes.

4.3 Common method bias

Given that individual-level constructs were rated at one point in time, we checked for possible common method bias (CMB) using two approaches. First, we conducted Harman's one-factor test (Podsakoff et al. 2003) among the items of individual-level variables. Four constructs with eigenvalues greater than 1.0 were extracted, accounting for 71.54% of the variance. The first construct did not account for most of the variance (18.70%). Second, following the suggestion of Podsakoff et al. (2003), we also compared the overall fit of the one-factor model (Model E) with that of the full measurement model (Model A) (see Table

3). Relative to the full measurement model, the noticeable mismatch between the one-factor model and dataset further indicated that the CMB was unlikely to threaten our results.

4.4 Hypothesis tests

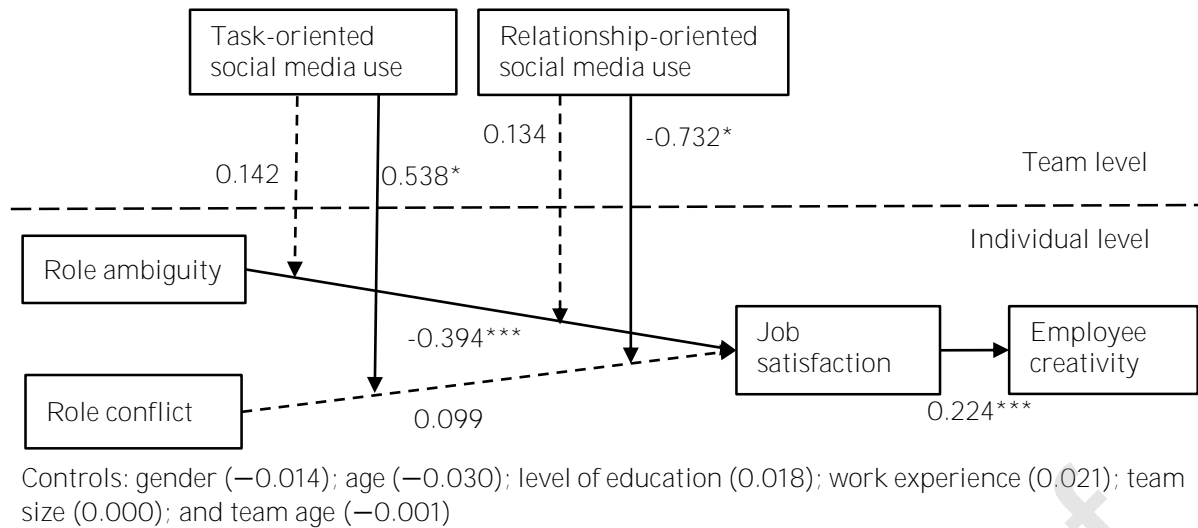
We utilized Mplus 7.4 (a multilevel structural equation modeling technique, MSEM) to analyze data for several reasons. First, 334 employees were nested within 56 work teams, violating the assumption of the independence of observations. Mplus can avoid inaccurate standard errors because of nonindependence (Bliese 2000). Second, scholars have suggested that MSEM can provide less biased estimates of path coefficients than multiple stages of analysis (Edwards and Lambert 2007; Preacher et al. 2010). We thus employed the integrated approach that MSEM recommends to simultaneously examine all putative relationships (i.e., mediation effects, moderation effects, and the two-level, first-stage moderated mediation model). Mplus can perform the simultaneous tests (Bauer et al. 2006; Preacher et al. 2010). Following prior studies (e.g., Lepine et al. 2016), we operationalized constructs as the averages of items to make the overall model not overly complex and to obtain a smaller parameter-to-sample-size ratio that can result in more stable parameter estimates. This approach is acceptable when items have a unidimensional structure (all constructs are unidimensional in this study) (Bandalos 2002). To appropriately test and interpret the cross-level moderating effects, we centered the individual-level exogenous variables (i.e., RA and RC) at each group's mean value and the team-level exogenous variables (i.e., TSM use and RSM use) at the overall mean value (grand mean). No controls were significantly related to employee creativity.

4.4.1 Mediating effects of job satisfaction

We used maximum likelihood estimation to calculate the coefficients. Relationships between individual-level variables were allowed to vary across groups. Figure 2 provides the standardized path coefficients. The RA–job satisfaction relationship was significantly

negative ($\beta = -0.394, p < 0.001$), whereas the RC–job satisfaction relationship was nonsignificant ($\beta = 0.099, p > 0.1$). Job satisfaction was positively related to employee creativity ($\beta = 0.224, p < 0.001$). We calculated the compound coefficients, which are not normally distributed, to derive the magnitude of indirect effects. Because traditional resampling methods (e.g., bootstrapping) are not applied to multilevel models, we adopted the Monte Carlo approach with 20,000 samples to construct bias-corrected confidence intervals (CIs) for testing the significance (Bauer et al. 2006; Preacher et al. 2010). The indirect relationship between RA and employee creativity through job satisfaction was significant ($\rho = -0.089, p < 0.01, 95\% \text{ CI} = [-0.163, -0.032]$). However, the indirect relationship between RC and employee creativity through job satisfaction was nonsignificant ($\rho = 0.032, p > 0.05$) because its 95% CI of $[-0.018, 0.068]$ included zero. Thus, H1a was supported, whereas H1b was rejected.

We further tested the significance of the direct effects of role stressors on employee creativity controlled by job satisfaction to determine whether mediating effects were full or partial. Given that the direct relationship between RA and employee creativity was significantly negative ($\beta = -0.279, p < 0.001$), job satisfaction partially mediated the RA–employee creativity relationship. Moreover, the RC–employee creativity linkage was significantly positive ($\beta = 0.217, p < 0.01$).



Note: Standardized path coefficients; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; dashed lines represent $p > 0.05$.

Figure 2. MSEM Results

4.4.2 Moderation of role stressor-job satisfaction linkages with social media use

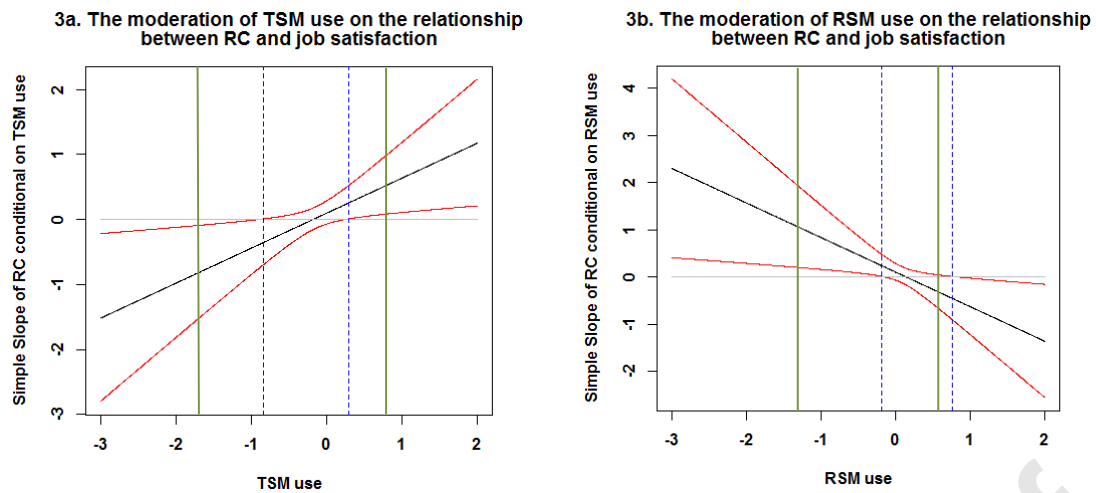
Although the RC-job satisfaction linkage and the indirect relationship between RC and employee creativity through job satisfaction were not significant, we note that tests of moderating effects do not statistically rely on significant main effects and mediating effects (e.g., Lepine et al. 2016; Zhang et al. 2014). Conceptually, the insignificance of a relationship between two constructs may be attributed to opposite directions at the low and high level of contextual conditions (e.g., McClean et al. 2013). We thus tested the cross-level moderating effects of social media use within teams on relationships between role stressors and job satisfaction. Results are summarized in Figure 2. The linkage between RA and job satisfaction was not moderated by either TSM use ($\gamma = 0.142$, $p > 0.05$) or RSM use ($\gamma = 0.134$, $p > 0.05$), rejecting H2a and H4a. However, for the path from RC to job satisfaction, TSM use was a positive and significant moderator ($\gamma = 0.538$, $p < 0.05$), whereas RSM use was a negative and significant moderator ($\gamma = -0.732$, $p < 0.05$).

To clearly interpret the significant interactions, we followed the recommendation of Preacher et al. (2007) to plot them using the Johnson–Neyman (J–N) technique (Bauer and

Curran 2005). This approach can estimate regions of significance and 95% confidence bands for simple slopes of predictor variables¹. It provides richer information than the conventional method of plotting simple slopes of the predictor variable at several designated values of the moderator (e.g., high, medium, and low) (Bauer and Curran 2005). The calculation² affirms that when the RC–job satisfaction linkage was a function of TSM use, the range of observed values of mean-centered TSM use (–1.70, 0.81) included regions of significance (–0.85, 0.29). The RC–job satisfaction linkage was significantly negative at values of TSM use between –1.70 and –0.85, not significantly at values of TSM use between –0.85 and 0.29, and significantly positive at values of TSM use between 0.29 and 0.81. Given that the slope of regression of job satisfaction on RC increased along with the level of TSM use (see Figure 3a), H2b was supported. Similarly, we calculated the regions of significance when RSM use was a moderator. The lower bound of regions of significance (–0.18) fell within the range of observed values of mean-centered RSM use (–1.21, 0.64), whereas the upper bound (0.75) does not. Figure 3b illustrates that the RC–job satisfaction linkage became significantly positive and weaker with the level of RSM use increasing from –1.21 to –0.18. However, this linkage was not significant when the values of RSM use ranged from –0.18 to 0.64. Given that the moderating effect of RSM use was significant but negative, we rejected H4b.

¹ According to Bauer and Curran (2005), the *region of significance* indicates over what range of the moderator, simple slopes of predictor variable conditional on the moderator become significant or insignificant; *confidence bands* denote the confidence interval over the full range of the moderator. The points where confidence bands cross zero are boundaries of region of significance.

²We used the online utility developed by Curran and Bauer. The materials can be retrieved from <http://quantpsy.org/interact/mlr2.htm>.



Note: The green vertical lines reflect ranges of the observed values of the mean-centered moderator; the blue vertical lines reflect the lower and upper bounds of regions of significance.

Figure 3a–3b. Johnson–Neyman plot of confidence bands

4.4.3 Moderation of mediated relationships

Given that indirect effects may vary at different levels of moderators, we also tested whether social media use within teams moderated mediated relationships. Following the procedure suggested by Edwards and Lambert (2007), we first calculated the magnitude of indirect effects at “high” and “low” levels of moderators (i.e., one SD above and below the mean) and then estimated the significance using the Monte Carlo approach. Table 5 exhibits that the indirect effect of RC on employee creativity through job satisfaction differed significantly when TSM use was at high versus low levels ($\Delta\rho = 0.104$, $p < 0.05$). The coefficient at the high level of TSM use ($\rho = 0.074$, $p < 0.05$) was positive and larger than that at the low level ($\rho = -0.030$, $p > 0.05$), which partially supported H3b. By contrast, the indirect effect of RC on employee creativity through job satisfaction at the high level of RSM use ($\rho = -0.032$, $p > 0.05$) was more negative than that at the low level of RSM use ($\rho = 0.076$, $p < 0.05$), which was contrary to H5b. Furthermore, we rejected H3a and H5a because the indirect effect of RA on employee creativity through job satisfaction did not differ significantly when TSM use ($\Delta\rho = 0.027$, $p > 0.05$) and RSM use ($\Delta\rho = 0.020$, $p > 0.05$) were at high versus low levels.

Table 5. Summary of indirect effects of role stressors on employee creativity through job satisfaction

	Average indirect effect	TSM use			RSM use		
		High	Low	Difference	High	Low	Difference
RA	-0.089**	-0.074*	-0.102*	0.027	-0.078*	-0.098*	0.020
RC	0.032	0.074*	-0.030	0.104*	-0.032	0.076*	-0.107*

Note: Estimates were tested for significance using bias-corrected confidence intervals from 20,000 resamples through the R program. Values in bold type were significant. *p < 0.05; **p < 0.01; ***p < 0.001.

5. Discussion, Implications, and Future Research

5.1 Discussion of findings

The present study investigated the relationships of RA and RC with employee creativity in a multilevel model by jointly considering job satisfaction as an intervening factor and team-level TSM use and RSM use as contextual conditions affecting these relationships.

Our findings contend that job satisfaction partially mediates the negative relationship between RA and employee creativity. One approach is consistent with our hypothesis claiming that RA impairs employee creativity by being appraised as a hindrance that suppresses individuals' positive work attitudes (i.e., job satisfaction) (Fried et al. 2008; Gilboa et al. 2008). The other approach demonstrates that RA has a direct negative association with employee creativity, because the lack of role information discourages individuals from thinking creatively when performing team tasks, which conforms to previous research (Coelho et al. 2011).

However, the intervening role of job satisfaction in the RC–employee creativity relationship is trivial as RC does not demonstrate a constant, significant relationship with job satisfaction when none of the conditions is considered. A possible reason is that RC may have complex influences on individuals' attitudes when being appraised as a combination of challenge and hindrance (Webster et al. 2011). When contextual conditions that elicit individuals' challenge appraisal and hindrance appraisal intermingle, the potential positive and negative effect of RC on job satisfaction may cancel each other out, causing an overall

insignificant relationship between RC and job satisfaction (McClellan et al. 2013; Woisetschlager et al. 2016). Furthermore, the unexpected finding that RC directly and positively relates to employee creativity implies that attitudinal reactions (e.g., job satisfaction) are not the sole direct drivers for team members' creative work behaviors. This finding may not be explained by the psychological mechanism of stressor appraisal. Schepers et al. (2016) adopt the situational strength theory to interpret why RC is positively associated with idea generation for improvement. They perceive high RC as a weak situation in which requests made by various role partners (e.g., peers and supervisors) are diverse, and corresponding appropriate behaviors are uncertain. To resolve the uncertainty, no matter which work attitude employees may hold, they are less likely to perform routinely, but rather to engage in problem-solving work patterns to generate new ideas and solutions to diversified demands (Byron et al. 2010; Coelho et al. 2011).

Findings also corroborate that team members' collective use of social media is a contextual condition to untangle the complicated, overall insignificant RC–job satisfaction linkage. Specifically, the nature of RC as a challenge stressor is more salient when social media use within the team plays the role of a contextual factor. With the level of TSM use rising, team members who are experiencing RC will not feel dissatisfied with their jobs any longer and may even be more satisfied. The rationale is that, by facilitating work interactions and resource exchange within teams, TSM use increases the possibility that employees appraise RC as a challenging career opportunity, which results in job satisfaction (Lepine et al. 2016). Contrary to our hypothesis, RC is more positively related to job satisfaction when the level of RSM use is low. One plausible reason is that as regards generating positive feelings about RC, RSM use resembles a source of work distraction (van Zoonen et al. 2017) more than a source of social support (Lin et al. 2015). This explanation is based on the attention focus model, which purports that employees who are under work pressure should

focus on task completion and relevant information to protect their positive attitudes from being weakened (Drach- Zahavy and Freund 2007). However, RSM use during working hours occupies employees' attention that should otherwise be devoted to addressing conflicting role expectations, thereby reducing the possibility that employees are rewarded for overcoming RC and feel satisfied. Prior evidence likewise inferred that abusing social media for social purposes may cause undesirable outcomes at work (Moqbel and Kock 2018; Turel and Serenko 2012).

We further validated the moderating effect of social media use on the indirect relationship between RC and employee creativity through job satisfaction. TSM use within teams enhances the intervening role of job satisfaction. When the level of TSM use is high, team members who come across RC tend to be more creative through feeling more satisfied with the job. In contrast, RSM use mitigates the mediating effect of job satisfaction. Only in teams whose RSM use score is low can RC have an indirect positive relationship with employee creativity through job satisfaction. These findings echo and extend prior studies that contend that interactions between work partners can reconcile indirect effects of RC (Montani et al. 2017; Zhang et al. 2014).

Conversely, neither TSM use nor RSM use within teams moderates the relationship between RA and job satisfaction. We offer the following explanations. First, Gilboa et al. (2008) have implied that unlike RC, which embodies the hindrance and challenge component to various degrees in different situations, RA is almost a pure hindrance. RC requires a dynamic theoretical model to depict its relationship with job satisfaction, whereas RA remains stable in influencing job satisfaction no matter how situations change (Ritter et al. 2016). Second, social support exchanged on social media platforms may have little influence on altering employees' negative appraisal of RA. Prior research has noted the insignificant moderating role of social support in the relationship between RA and job satisfaction (Kawai

and Mohr 2015). Moreover, we did not find evidence for the moderated mediating effect of job satisfaction on the RA–employee creativity relationship. This indirect association remains significantly negative regardless of the level of social media use because RA as a hindrance has stable outcomes (Ritter et al. 2016). This finding merits further investigation.

5.2 Theoretical implications

Our findings make several contributions to the extant literature. First, this study adds to inquiries into the role stressor–employee creativity relationship by testing the mediating role of job satisfaction in the organizational team context. Although scholars have realized that employee creativity is accompanied by stress issues, empirical investigations into the linkage between role stressors and employee creativity are still at a nascent stage and predominantly conducted in organizational settings (Coelho et al. 2011; Montani et al. 2017; Wang et al. 2011). Despite the salience of role stress phenomena for organizational teams (Savelsbergh et al. 2012; Windeler et al. 2017), existing understanding about how team members enact creativity when experiencing role stressors remains incomplete and fragmented. Given that attitudinal reactions can mediate the effect of stressors on behavioral reactions (Fried et al. 2008; Gilboa et al. 2008), we attempt to address this gap by proposing job satisfaction as a mediating mechanism, because job dissatisfaction is the most obvious attitudinal reaction to work stressors (Beehr and Newman 1978). Our work may inspire investigations into whether other work attitudes (e.g., job involvement and psychological empowerment) can also play a mediator role. In addition, our findings challenge the dominant view that considers RA and RC as a homogeneous hindrance (e.g., Moore 2000; Tubre and Collins 2000) by revealing their distinctions in affecting employees' work attitudes and creative behaviors. Specifically, RA is a pure hindrance while RC can be a hindrance or a challenge depending on various situations. We call for further verifications in future studies.

Second, our research provides new insights into the transactional theory of stress by embedding individuals' stress appraisal processes in a multilevel model and exploring the cross-level moderating role of social media use within teams. Prior research has realized the importance of multilevel theorizing for comprehensively understanding role issues within teams (Kauppila 2014; Savelsbergh et al. 2012). Our conceptualization of social media use within teams and exploration of how individuals' appraisal of role stressors varies contingent upon team-level social media use can function as an empirical example. Our study also sheds light on the contextual conditions under which role stressors influence job satisfaction, thereby affecting employee creativity. We verify that social media-enabled interpersonal interactions can reconcile how role stressors affect individuals' work attitudes and behaviors and even moderate the indirect effects of stressors on behaviors through attitudes, which empirically support the proposition that IT is able to alter the way employees think and behave at work (Reyt and Wiesenfeld 2014). These findings complement previous studies that regarded traditional organizational management practices (e.g., leadership) as contextual conditions of the effects of role stressors (Lepine et al. 2016; Montani et al. 2017; Zhang et al. 2014).

Third, our study enriches the social media literature by echoing the calls for completing the picture of what consequences social media use in the workplace might have on individuals, teams, and organizations (Leonardi et al. 2013; Treem and Leonardi 2012). Scholars have obtained considerable knowledge about the performance effect of social media use by clarifying the underlying mechanisms from the perspective of knowledge management (Leonardi 2015; Mäntymäki and Riemer 2016), the perspective of social capital (Ali-Hassan et al. 2015), and their combination (Cao and Ali 2018). However, our study serves as a counterweight to the performance-centric research by examining the effect of social media use on employees' psychological processes (Cai et al. 2018), particularly stress appraisal

processes. Specifically, we consider social media use within teams as a contextual factor that influences individuals' cognition, affection, and behaviors (McFarland and Ployhart 2015), and validate its moderator role, which contributes to IS field because prior studies predominantly treated social media use as antecedents (e.g., Kuegler et al. 2015; Luo et al. 2018; van Zoonen et al. 2017).

We further differentiate two usage patterns of social media in enterprises (i.e., task-oriented and relationship-oriented uses) in terms of their effects on employees' stress appraisal processes. An affordance approach is embraced to elucidate how employees use social media because it depicts "the relational structure between a technology and the user" (van Zoonen et al. 2017, p. 603) and reflects the differences between social media and other communication tools (e.g., Cai et al. 2018; Rice et al. 2017; Treem and Leonardi 2012). Research findings show that task-oriented and relationship-oriented uses exert opposite effects on the role conflict–job satisfaction relationship, which corroborates the notion that the same affordance could cause contradictory consequences (Gibbs et al. 2013; van Zoonen et al. 2017). Our study empirically confirms that the influence of IT depends on specific ways and situations in which IT is harnessed (Ali-Hassan et al. 2015; Kuegler et al. 2015).

Finally, although we consider both RA and RC as hindrances based on the dominant view (e.g., Fried et al. 2008; Tubre and Collins 2000), our findings revealed their distinctiveness in affecting employees' work attitudes and creative behaviors, as well as in interacting with contextual factors. These unexpected findings may add to the current discussion of different role stressors. We encourage further efforts to better conceptualize RA and RC from various theoretical perspectives.

5.3 Practical implications

This study also provides several suggestions for team management. First, for team managers who pursue employee creativity, we suggest they mitigate RA perceived by team

members by taking measures such as specifying task responsibilities, performance criteria, and work procedures. However, given the facilitating nature of RC for employee creativity, team managers should construct a work environment in which team members experience the appropriate level of role conflict, so that team members' problem-solving mindset and creative work behaviors can be activated. For example, assigning tasks with challenging or complex requirements to team members is a common way of helping team members develop their perceptions on role conflict.

Second, given that team managers may still be confused about why role stressors can be manipulated to stimulate employee creativity, we caution team managers to note that role stressors can arouse team members' attitudinal reactions, such as job satisfaction, which serves as an intrinsic impetus for creative work. After taking steps to influence team members' perceptions on role stressors, managers should pay attention to changes in their subordinates' job satisfaction with respect to work settings, career prospects, and relationships with teammates and accordingly offer moral or material support to deal with the dissatisfaction.

Third, we provide practitioners with a new perspective to comprehend social technology in "digitally challenged organizations" (Davison and Ou 2017), that is, in addition to improving work performance, social media can also help address role stress issues. Through elucidating differences between two usage patterns of social media in influencing team members' psychological processes, we suggest team members should use social media for work interactions rather than for social chats during working hours, to leverage RC for job satisfaction. We also remind team members of the inability of social media to alleviate the negative influence of RA. Our study may inspire team managers to deliberately design governance strategies for social media use.

5.4 Limitations and future research

The current study bears several limitations. First, constructs regarding the main effects were measured at one single point in time, which only captured a snapshot of sample teams. Although the proposed causal direction from role stressors to behaviors through attitudes is indicated by theory (Gilboa et al. 2008; Webster et al. 2011), we could not safely conclude that the causality exists. Future research can employ a longitudinal design or experimental approach to elaborate on the extent to which changes in role stressors lead to change in employees' attitudes and behaviors, so that the causality in the main effects can be better validated. Furthermore, team-level variables (i.e., social media use) and individual-level variables (i.e., role stressors, job satisfaction, and employee creativity) were assessed by not completely identical respondents from the 56 identified teams at two separate time points. Although we have justified this measurement procedure, we should also measure social media use within teams again in the second survey and assess whether there is any significant difference from ratings in the first survey.

Second, we drew on the affordance lens to propose the moderating effect of social media use to highlight the uniqueness of this technology (Cai et al. 2018; Rice et al. 2017; Treem and Leonardi 2012). However, we did not explicitly measure the affordances of social media given that our main purpose is to distinguish task-oriented and relationship-oriented usage patterns with a concise research model. Future research can narrow the focus on affordance lens and treat visibility, persistence, editability, and association as study variables to investigate how potential actions that are afforded by features of social media influence employees' cognitive appraisal of stressors. This endeavor may contribute to an in-depth understanding of the suitability of technical features for supporting usage patterns, rather than usage patterns per se.

Third, we assumed that public and private social media platforms have no difference with respect to affordances because the definition of social media regards affordances as general inherent features (Gibbs et al. 2013; Leonardi et al. 2013). However, we did not address the potential diversity in employees' perceptions on public and private social media (Treem and Leonardi 2012), as well as the situation when organizational policies govern how employees use various technologies (Davison and Ou 2017). Future research can explore the disparate influences of public and private social media platforms.

Finally, although we focused on team members' collective use of social media, we recognized that individuals are the ones who interact on social media platforms (especially public ones). We suggest that future research incorporate the collective use and individual use of social media into a multilevel model and consider team-level IT governance structures. Examining role stressors in the case of tensions between employees and teams may be more insightful.

6. Conclusion

Given that organizational team members are encouraged to engage in creative work even when experiencing role stressors, our research examines the mechanism and contextual factors associated with effects of role stressors on employee creativity based on the transactional theory of stress. Our empirical findings reveal that job satisfaction partially mediates the RA–employee creativity linkage. RA and RC have a direct negative and positive relationship with employee creativity, respectively. We also validate the opposite moderating role of task-oriented and RSM use on the relationship between RC and job satisfaction. Furthermore, only at specific levels of social media use can RC have an indirect positive effect on employee creativity through job satisfaction. This study contributes to the role stressor literature, the employee creativity literature, and the social media literature. We advise managers to improve employee creativity by carefully handling employees' role

stressors, promoting employees' job satisfaction, and governing social media use within teams.

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APPENDIX A. Description of the pilot study

The pilot study aimed at elucidating the communication practices within the targeted teams. We examined how frequently team members use public and private social media at work, as well as inquired about other communication and collaboration modes. A total of 36 teams made a response by assigning one representative. Results indicate that WeChat (a Chinese microblogging tool) is most frequently used. All sample teams use WeChat at work and 91.6% of them use it at least once a day. Private social media platforms such as DingTalk and Jingao are used by 58.3% of sample teams at least once a day. However, wikis and blogs are rarely utilized by sample teams for teamwork. Although other communication modes have been pervasive for many years, their use frequency is notably lower than that of social media tools. Specifically, 69.4% and 66.7% of sample teams, respectively, use email and instant messaging tools for work interactions at a frequency of “at least once a week.” Sample teams between 47.2% and 58.3% exchange information face-to-face and with conference-call services at least once a week. Overall, all sample teams use some types of social media at a comparable and high frequency level, which can rule out the influence of use frequency on differences between teams to some extent.

APPENDIX B. Measurement items

Construct	Measurement items	Scale source
Role ambiguity (RA)	*I feel certain about how much authority I have within this team.	Rizzo, House, and Lirtzman (1970)
	1. I have clear, planned goals and objectives for my job in this team.	
	2. Within this team, I know that I have divided my time properly.	
	3. Within this team, I know what my responsibilities are.	
	4. Within this team, I know exactly what is expected of me.	
Role conflict (RC)	5. Explanation is clear of what has to be done on team tasks.	Rizzo, House, and Lirtzman (1970)
	*within this team, I have to do things that should be done differently.	
	1. Within this team, I receive an assignment without the manpower to complete it.	
	2. Within this team, I have to "buck" a rule or policy to carry out an assignment.	
	3. Within this team, I receive incompatible requests from two or more people.	
	4. Within this team, I do things that are apt to be accepted by one person and not accepted by others.	
Job satisfaction (JSA)	5. Within this team, I receive an assignment without adequate time, resources, and materials to execute it.	Diestel, Wegge, and Schmidt (2014)
	6. Within this team, I work on unnecessary things.	
	1. All in all, I am satisfied with my working conditions (e.g., resources, equipment, and facilities).	
	2. All in all, I am satisfied with the team and management (e.g., procedures, rules, and regulations, as well as the team management).	
	3. All in all, I am satisfied with my career opportunities (e.g., personal development).	
Task-oriented social media use (TSM use)	4. All in all, I am satisfied with my teammates.	Ding et al. (2015)
	5. All in all, I am satisfied with my immediate supervisor.	
	*Our team uses social media to plan how the work gets done.	
	1. Our team uses social media to decide how to go about our team's work.	
	2. Our team uses social media to set our team's goals.	
	3. Our team uses social media to organize tasks so that work flows more smoothly.	

	4. Our team uses social media to decide on the best course of action when problems arise.	
	*Our team uses social media to diagnose problems quickly.	
	5. Our team uses social media to leverage the team's combined expertise to solve problems.	
	6. Our team uses social media to identify problems before they arise.	
	*Our team uses social media to develop solutions to problems.	
	7. Our team uses social media to solve problems as they arise.	
Relationship-oriented social media use (RSM use)	1. Our team uses social media to provide support to team members who need help.	Ding et al. (2015)
	2. Our team uses social media to encourage team members when they are upset.	
	3. Our team uses social media to listen to complaints and problems of team members.	
	4. Our team uses social media to foster a cohesive team atmosphere.	
	*Our team uses social media to help to develop each other's skills.	
	*Our team uses social media to learn skills from all other team members.	
	5. Our team uses social media to be positive role models to new members of the team.	
	*Our team use social media to help out when a team member is learning a new skill.	
Employee creativity (ECR)	1. I can suggest many creative ideas that might improve working conditions in my team.	Farmer et al. (2006)
	2. I often come up with creative solutions to problems at work.	
	3. I can suggest new ways of performing work tasks.	
	4. I can be rated as a good source of creative ideas.	

Note: * Item eliminated during scale purification