Research on Workplace Creativity: A Review and Redirection

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Abstract

Workplace creativity exhibited by individual employees and teams is a key driver of organizational innovation and success. After briefly touching upon issues related to the historical roots of research on workplace creativity, we focus on reviewing empirical work published since 2000 by researchers in the field of organizational psychology and management. We observe that although earlier research tended to take either an actor-centered or a context-centered approach, continuing to do so may have diminishing returns. To understand creativity in all its complexity and potential, an interactionist perspective that emphasizes actor–context interactive effects on creativity holds much promise. Moreover, after reviewing existing work taking an interactionist approach, we conclude that the nature of the actor–context interaction needs further theoretical advancement and refinement. Toward this end, we propose a typology that reveals a complex and intriguing set of actor–context interactions, including ones that are synergistic, antagonistic, inhibitory, remedial, and configurational, as well as ones that show patterns of diminishing gains and diminishing losses. We also discuss future research directions and practical implications.

INTRODUCTION

Creativity is widely seen as a driver of innovation, growth, and societal development. Although a more nuanced account of its consequences is starting to emerge (Gilson 2008, Gong et al. 2013), creativity is still seen as a vital means for organizations to thrive in dynamic environments, respond to unforeseen challenges, and proactively develop new capabilities. Attesting to this perceived importance, Barsh et al. (2008) found that a large portion of managers considered innovation to be one of the key determinants of success. Unfortunately, an almost equally large portion of senior managers from the same sample reported being less than confident in their ability to promote this valued outcome. Creativity and innovation are distinct concepts. Yet most researchers reserve a central role for creativity in providing the core ideas that may ultimately lead to innovation and help overcome the challenges arising during implementation. Accordingly, research on workplace creativity may offer valuable insights into how to promote workplace creativity, thus increasing the chance of achieving innovative outcomes.

As authors of this review, we are in many ways in a luxurious position. This is an exciting time for the study of workplace creativity. Whereas the first *Annual Review of Psychology* article devoted to creativity was published at a time when creativity research was a domain addressed predominantly by personality psychologists (Barron & Harrington 1981), the most recent review we found highlights workplace creativity as one among many important domains of creativity research across different levels of analysis (Hennessey & Amabile 2010). This change is a testament to a steadily growing number of research studies focusing on an increasingly diverse set of factors that may function as antecedents of creativity in the workplace. These developments are promising and important, yet their theoretical and practical value ultimately depends on the ability to combine this diversification with sustained efforts to integrate the findings into a larger, coherent picture. In other words, in an instance of self-reference, the idea that high-quality creative outcomes require a combination of divergence and convergence (Cropley 2006) appears to hold true for creativity research as well.

Reviews and meta-analyses are important tools to promote this integration, and adding to our luxury, a number of invaluable efforts have been undertaken to summarize this continuously expanding line of work. Different authors have published reviews organized by antecedents (e.g., Shalley et al. 2004), at times focusing on the conceptual classes of psychological processes they elicit (e.g., Zhou & Shalley 2011) or on specific subsets of antecedents (e.g., contextual factors; Shalley & Gilson 2004). Moreover, edited volumes on organizational creativity (e.g., Zhou & Shalley 2008b) and creativity in teams (Thompson & Choi 2006) have provided important compendiums that organize our knowledge. Complementing these narrative reviews, meta-analyses have been conducted on the effects of affect (Baas et al. 2008, Davis 2009), rewards (Byron & Khazanchi 2012), and stressors (Byron et al. 2010) on creativity across studies mainly in the laboratory but also the field, as well as on the effects of personality on the creativity of scientists and artists (Feist 1998). A recent meta-analysis also compared the effects of different antecedents of creativity and innovation in teams (Hülsheger et al. 2009).

Narrative and quantitative reviews are important steps toward achieving integration. Yet, the almost unanimous conclusion from these efforts is that effects of the same antecedent variables are often heterogeneous across studies and settings. Some researchers have attempted to address these inconsistencies by distinguishing between different types of creativity theoretically (Unsworth 2001) or empirically (e.g., Madjar et al. 2011), as well as between creative behaviors and creative outcomes (Montag et al. 2012). These scholars propose that creativity is not a uniform construct across all settings; instead, several types of creativity need to be differentiated based on the context in which they were developed. We commend these efforts and argue that they need to be complemented

by a more detailed understanding of how different antecedents jointly affect creativity. Accordingly, instead of providing an exhaustive review of the workplace creativity literature, we aim to take stock of research conducted in line with Woodman and colleagues' (1993) interactionist account of creativity in organizations, which views creativity to be the result of a complex interplay of (*a*) stable or transient characteristics of an actor (individual, dyad, or team) and (*b*) contextual factors. This review shows that workplace creativity research has moved beyond a pure main-effects approach highlighting either actor or context characteristics. Moreover, it reveals the need to refine our understanding both of the role of contextual variables and of the way in which they interact with actor characteristics.

In the following section, we define creativity and delineate the body of research we review. This forms the foundation for a brief historical review of early workplace creativity research and the increasing consideration of contextual influences on creativity. We then briefly review, first, recent research focusing on the separate or additive effects of actor characteristics and, second, recent research focusing on such effects of contextual characteristics. In the subsequent main part of the review, we suggest an organizing scheme for research focusing on the interplay of actor and context, which we then use to summarize the relevant research findings of the past decade. Given that the question of whether or not the relations between creativity and its antecedents are predominantly homologous across different analysis levels remains largely unanswered, we review research that focuses on the creativity of dyads or teams in separate but adjacent sections from research conducted on individual-level creativity.

DEFINING AND DELINEATING WORKPLACE CREATIVITY

In the field of organizational behavior, creativity is usually defined as an outcome—that is, products, services, business models, work methods, or management processes that are novel and useful (Amabile 1988, Shalley et al. 2004, Woodman et al. 1993). This emphasis on creativity as an outcome, instead of the mental process through which creative ideas ultimately emerge, allows creativity to be quantified with relative ease and consensus (Amabile 1996). In field studies, creativity is usually measured by scales that assess both novelty and usefulness (e.g., Oldham & Cummings 1996, Tierney et al. 1999, Zhou & George 2001). Eschewing a definition that includes both novelty and usefulness, research in social and personality psychology often conceptualizes and operationalizes creativity in terms of novelty, fluency, flexibility, and originality (Shalley & Zhou 2008). Reflecting these different traditions, in lab studies, creativity is alternately operationalized as judges' ratings of novelty and originality only, as the product of multiplying judges' ratings of novelty and usefulness, as the number of ideas generated (fluency) and the total number of different categories of ideas generated (flexibility), or as judges' overall ratings of creativity defined as ideas that are both new and useful (for more detail on how creativity is operationalized in field and lab studies, see Zhou & Shalley 2011). Creativity may be the outcome of individuals or teams, regardless of their functional areas and positions in the organizational hierarchy. Whereas creativity focuses on idea production, innovation includes both idea production and implementation. As such, creativity is the first and crucial stage of innovation, but predictors of ideation and implementation are likely to differ.

Given our focus on workplace creativity and our aim to provide insights that may be extracted from the literature but have not yet been systematically highlighted in prior reviews, together with space constraints, we selectively included papers to be reviewed only if they met certain criteria. Studies had to (*a*) focus on creativity as the key phenomenon of interest, (*b*) be published since 2000, (*c*) use employee samples or, when using student samples, focus on variables with clear implications for workplace creativity, and (*d*) present results that are interpretable and based on

a research design that does not raise concerns of single-source, self-report, or common-method bias. Papers published in premier journals in organizational psychology and management rarely raise serious concerns in this last respect. Thus, we review papers published in the premier journals.

PUTTING CREATIVITY IN CONTEXT: A REVIEW OF THE ROLE OF CONTEXT IN CREATIVITY RESEARCH

The Historical Roots of Workplace Creativity Research

Two prior contributions to the *Annual Review of Psychology* on creativity in the adult population are Barron & Harrington's (1981) "Creativity, Intelligence, and Personality," which took a decidedly actor-centered approach and focused on individual differences, and Hennessey & Amabile's (2010) "Creativity," which advocated a systems view on creativity. Since the 1990s, creativity has increasingly been established as a topic of interest to organizational psychologists and management scholars in its own right. In line with the origins of creativity research, earlier approaches continued to emphasize an actor-centered approach, and this line of research is still active today. It has been extended from the initial focus on individuals and their predominantly stable differences in creative ability and personality (see Barron & Harrington 1981) to also include temporary states as antecedent variables as well as dyads and workgroups as creative actors. Increasingly, this actor-centered approach has been complemented by a study of contextual influences on creativity.

Below we briefly review research from these approaches. The review will show that (*a*) research is gradually moving toward a more complex understanding of the antecedents of creativity (e.g., through interactions, indirect effects), (*b*) studies increasingly involve a joint consideration of actor and context (through concepts that capture actors' perceptions of, relations to, or positions in their environments, or through situational factors that influence actor-level factors, which in turn influence creativity), and (*c*) reliable main effects are hard to find.

Actor-Centered Accounts of Workplace Creativity

Creativity as an individual outcome. Some studies following an actor-centered approach focus on the main effects of actors' personality characteristics (proactive personality; Gong et al. 2012a), self-concepts (e.g., creative self-efficacy, Tierney & Farmer 2002, 2011; individual differentiation from teammates in terms of thinking and feeling, Janssen & Huang 2008), positive affect (Amabile et al. 2005), and optimism and hope (Rego et al. 2012a,b), as well as creativity-related behaviors (creative process engagement; Zhang & Bartol 2010). Although these studies found main effects of actor factors, other studies failed to do so. For example, Raja & Johns (2010) showed that apart from openness to experience, none of the Big Five personality factors directly affected creativity.

Other studies following an actor-centered approach explore the impact of the interplay between multiple actor-level variables on workplace creativity. For instance, Tierney & Farmer (2002) found that creative self-efficacy had a positive effect on creativity. Interestingly, in one of two organizational samples, this effect was moderated by general job self-efficacy such that creative self-efficacy's effect on creativity was positive when job self-efficacy was high but negative when job self-efficacy was low. Likewise, Tadmor and colleagues (2012) found that individuals' identification with their host cultures and their home cultures interacted such that individuals who highly identified with both their host and their home cultures were more creative than were individuals who highly identified with either their home or host cultures alone. The benefit of this dual identification was mediated by integrative complexity.

Bledow and colleagues (2013) studied the interplay and temporal dynamics of positive and negative affect on self-reported creativity. Experiencing negative affect in the morning and positive affect in the afternoon interacted to predict daily creativity such that experiencing positive affect in the afternoon had a more positive effect when following high, rather than low, negative affect in the morning. Moreover, the effect of changes in positive affect was moderated by changes in negative affect such that an increase in positive affect had a more positive effect on creativity when it was accompanied by a decrease in negative affect. To and colleagues (2012) showed that positive activating moods had a more positive effect on employees' creative process engagement when the employees were high, rather than low, in learning goal orientation.

Across one lab and two field studies, Grant & Berry (2011) found that the effect of intrinsic motivation on creativity was moderated by prosocial motivation such that it was positive when prosocial motivation was high, and not significant when prosocial motivation was low. The authors also showed that prosocial motivation promoted perspective taking, which interacted with intrinsic motivation in the same fashion as prosocial motivation and mediated the moderating effect of prosocial motivation on the relationship between intrinsic motivation and creativity. Mueller & Kamdar (2011) showed that intrinsic motivation had an indirect effect on creative performance through help seeking. Yet although help seeking benefited creativity, it also came at the expense of increased help giving, which negatively affected creativity. Help giving interacted with help seeking to predict creativity such that higher levels of help giving reduced the positive effect of help seeking on creativity.

Creativity as a dyadic or team outcome. Several studies investigated how the characteristics of a dyad or team as the creative actor (e.g., composition, member behaviors, collective affective states, task experiences) individually or jointly affect group creativity. Focusing on a single group characteristic, in a laboratory study, Chirumbolo and colleagues (2005) found that groups composed of members high in dispositional need for closure were less creative than were groups with low member need for closure. Using cluster analysis, Gilson & Shalley (2004) found that teams reporting shared goals, participative decision making, a supportive climate, member socializing, and longer organizational tenure of team members also engaged in the creative process to a higher degree. Gino and colleagues (2010) found that direct task experience (but not indirect experience or no experience) had a positive impact on team creativity.

Other research points to the possibility that the creative benefits of certain team composition characteristics require certain member behaviors to be realized. In this vein, Taggar (2002) found that the benefits of aggregate individual member creativity for team creativity were contingent on members engaging in so-called team-creativity relevant processes (e.g., conflict management, team citizenship behaviors). Similarly, Hoever and colleagues (2012a) found that team diversity and team member perspective taking interacted to affect team creativity such that diverse perspectives within a team promoted team creativity when members were high in perspective taking, but diversity had no effect on creativity when perspective taking was low. Tsai and colleagues (2012) found an interactive effect among three team-level actor characteristics: Team positive affective tone had a positive impact on team creativity only when team trust was low and team negative affect tone was high.

Context-Centered Accounts of Workplace Creativity

Studying creativity from an organizational standpoint inevitably directs attention to the ways in which this outcome is contextually embedded. Accordingly, researchers increasingly rejected the notion of creativity as exclusively determined by individual dispositions (Amabile 1988, Woodman

et al. 1993) and began studying the influence of aspects of the task, the physical environment, and the social environment, including coworkers, teams, leaders, and the customers benefitting from an employee's creativity. This section reflects the continued interest in examining creativity as the result of contextual influences.

Creativity as an individual outcome. Employee creativity varies as a function of the characteristics of the task and work. Ohly and colleagues (2006) reported that job control and routinization were positively related to self-reported creativity. They also showed a curvilinear relation between time pressure and creativity, with those employees working under moderate degrees of time pressure reporting the highest levels of creativity. Likewise, factors in an actor's social environment promote creativity. Madjar & Shalley (2008) examined the effects of multiple goals and different tasks and found that individuals exhibited the highest creativity when they had goals for all tasks and had discretion to switch between the tasks. Madjar & Ortiz-Walters (2008) reported additive benefits of both customer trust and customer input on the creativity of hairstylists. Thatcher & Greer (2008) found that team members' accurate understanding of the relative importance of a focal teammate's identity was positively related to this person's creativity.

Signaling increased attention to the joint consideration of actor and contextual factors, some research models how contextual influences are effectuated through actor-level variables. Using an experience sampling approach to study the effect of job characteristics, Ohly & Fritz (2010) showed that chronic time pressure and chronic job control both had direct positive effects on employees' daily creativity. In addition, chronic job control and time pressure affected creativity indirectly by promoting daily job control and daily time pressure, respectively, which in turn led actors to view their work as (positively) challenging. These daily levels of challenge appraisal were linked to higher levels of daily creativity.

A number of studies also speak to the effect of the extent to which organizations, leaders, and extraorganizational actors support, expect, or reward creativity on actors' psychological states and, in turn, their creativity. The benefit or detriment of external rewards on creativity remains a subject of scholarly debate (see Baer et al. 2003 for findings of contingency effects, Hennessey & Amabile 2010 for a recent discussion, and Byron & Khazanchi 2012 for a meta-analysis). However, some research points to the creative benefits of rewards. For instance, Eisenberger & Rhoades (2001) found positive effects of receiving or expecting rewards for creativity on subsequent creativity. They demonstrated that these effects were mediated by employees' intrinsic interest in the job and by perceived self-determination. Eisenberger & Aselage (2008) also examined the effect of performance reward expectancies and rewards for creativity. They found that this effect unfolded through a sequence of mediating effects in which reward (or its expectancy) positively affected creativity through perceived performance pressure and self-determination as distal mediators and through intrinsic motivation as a proximal mediator.

Studying supervisors, Tierney & Farmer (2004) showed a positive effect of supervisor expectations for creativity on employee creativity through a Pygmalion-like process involving the perceived level of creativity-supportive behaviors supervisors engaged in, the resultant employee perception that creativity was expected, and the ensuing increase in creative self-efficacy. Extending these results, Tierney & Farmer (2011) showed that changes in the perceptions of supervisory expectation of creativity over the course of six months were linked to changes in employees' creative self-efficacy. These changes in creative self-efficacy in turn were linked to changes in supervisor-rated creativity. Similarly, Madjar and colleagues (2002) found that work support for creativity from supervisors and coworkers and nonwork support from family and friends each enhanced employee creativity by promoting positive affect. Likewise, De Stobbeleir and colleagues (2011) showed that perceived organizational support for creativity had a positive

effect on creativity that was partly mediated by the extent to which employees frequently inquired feedback from a variety of sources. Choi (2004) found that desired, but not current, creative climate benefited creativity.

Beyond creativity-specific contextual factors, creativity also benefits from more generalized contextual influences. Research indicates that transformational leadership fosters creativity (Gong et al. 2009, Shin & Zhou 2003). Khazanchi & Masterson (2011) showed that supervisor informational and interpersonal justice promoted employees' trust in their supervisors, supervisor informational justice and trust in supervisors promoted the perceived quality of the exchange relationship between the supervisor and the employee (leader–member exchange, LMX), and LMX related positively to information sharing, which in turn positively related to creativity. Alge and colleagues (2006) found that perceived information privacy indirectly promoted creativity through psychological empowerment.

Although some contextual factors may have unconditional direct or indirect effects on creativity, research increasingly also demonstrates the interactive effects among contextual factors. Wang & Cheng (2010) found that the benefits of benevolent leadership for creativity emerged when job autonomy was high, but not when job autonomy was low. Likewise, Zhou (2003) showed that the presence of creative coworkers both accentuated the negative effects of supervisor close monitoring on creativity and helped bring out the benefits of supervisor developmental feedback to promote creativity.

Additionally, leadership style and expected behaviors can shape the effect of information and examples available within an actor's environment. For example, Shin and coauthors (2012) found that perceived cognitive team diversity's effect on an individual member's creativity was moderated by the leader's display of transformational leadership: The effect of diversity on individual creativity was positive when leaders were perceived as highly transformational, whereas diversity had no effect when leaders were low in transformational leadership. Shalley & Perry-Smith (2001) found that whether individuals expected an informational or controlling evaluation of their ideas shaped the effect of receiving a creative example, a standard example, or no example before working on a task. Specifically, individuals expecting an informational evaluation benefited from both creative and standard examples compared with no example, but those expecting a controlling evaluation were less creative following a standard example compared with receiving no example.

Other studies point to the interactive effects among characteristics of an individual's social network. Perry-Smith (2006) found that the effect of centrality on creativity was positive when the number of outside ties was low but that centrality had no effect on the creativity of individuals with a high number of outside ties. Conversely, the number of outside ties had a positive effect on the creativity of more peripheral individuals but was negative for those occupying a central network position. Baer (2010) found that tie strength, network diversity, and network size interacted. Network size exhibited a curvilinear (∩-shaped) effect on creativity when ties were weak and the network was diverse, rendering those that had moderately sized networks under these conditions more creative than those embedded in other types of networks.

Like the studies on the single or additive effects of contextual factors, some research reporting interactive effects of different contextual factors explicitly studies the person-level processes or states that underlie these effects. Liu et al. (2011) found that unit support for autonomy and team support for autonomy interacted such that unit support for autonomy was more beneficial for the creativity of individuals when team support for autonomy was low rather than high. This moderated effect was mediated by individual team members' harmonious passion. Hirst and colleagues (2009a) showed that the effect of leader inspirational motivation on creative effort (an antecedent of creativity) was more positive when leaders were highly prototypical and more negative when leaders were less prototypical. Porath & Erez (2009) found that the negative effect

of witnessing rudeness not only was contingent on whether the reward structure promoted competition, but also was effectuated through negative affect. In some cases, the reported mediating mechanisms are specific to the task or the contextual factor. For instance, Chua (2012) found that the negative effect of ambient disharmony between two persons of different cultures (but not of the same culture) on a third actor's multicultural creativity was mediated by the third actor's beliefs about the incompatibility of different cultures.

Creativity as a dyadic or team outcome. With respect to research on the creativity of dyads or teams, studies focusing on contextual antecedents are less common. Nevertheless, some recent work attests to the impact of task structures, creativity requirements, and organizational climate on team creativity. In addition to the team characteristics reviewed above, Gilson & Shalley (2004) found that the more team members perceived a job requirement for creativity and the higher their task interdependence, the more they engaged collectively in the creative process. Somewhat in contrast to this observed benefit of interdependence between members, Girotra and colleagues (2010) contrasted different task structures and found that allowing team members to tackle an idea-generation task individually first before engaging in collective ideation led teams to generate ideas of higher quality (in terms of business value and purchase intent rated by knowledgeable observers) than those generated through purely group-based ideation. Whereas the previous results leave unanswered the question of how these context effects occur, a longitudinal study by Pirola-Merlo & Mann (2004) suggests that the creativity of individual members themselves may be one mediating route of the effects of context on team creativity. The authors found that both organizational encouragement of creativity and a team climate for innovation affected individual members' creativity and the creativity of the team as a whole. Yet, when the strong positive effect of individual members' creativity was accounted for, both organizational encouragement of creativity and team climate for innovation ceased to have an effect on team creativity.

Limitations of Separate Actor- or Context-Centered Accounts

The research reviewed above shows that creativity is influenced both by factors inherent to an actor and by those pertaining to context. Studying their independent effects is an important step toward understanding how creativity can be fostered. However, this approach renders implicit the realization that creativity is determined by the interplay of an actor and his or her context, and it masks the insight that an appropriate understanding of what drives creativity also requires a detailed study of this interplay. Recent theoretical advances reflect this notion. Unsworth (2001) argues that antecedents of creativity are likely to differ as a function of whether creativity is externally expected and whether the problem is clearly identified or needs to be discovered by the actor. Concerning teams, DeRue & Rosso (2009) propose that the effects of team structure and standardization on team creativity depend on the team's status in its development cycle. Correspondingly, work on the contextual antecedents of creativity increasingly incorporates actor-level states as mediators of the contextual effects, thus explicitly addressing the strong interrelations between actor- and context-specific factors in their impact on creativity.

Despite these advances, there is reason to suggest that reaching a fuller understanding of when and how employees and teams exhibit high levels of creativity might ultimately require investigation of (*a*) how the effect of certain actor characteristics on creativity differs contingent on differences in the context in which the actor is embedded or, conversely, (*b*) the differential effects of certain contextual factors on the creativity of different types of actors. More broadly speaking, psychological research has developed cogent arguments that traits do not fully determine behavior but rather are expressed partly as a function of and shaped by contextual characteristics (Tett &

Burnett 2003). Complementing this perspective, management scholars have explicated how situations vary along multiple facets of situational strength, including the extent to which the situations prescribe specific actions, provide consistent cues about the desirability of certain behaviors, link desirable behaviors to rewards or sanction undesirable behaviors, and limit the discretion to choose between different actions (Meyer et al. 2010). Though possible, contexts with extreme situational strength that leave no room for interpretation or variation in the reaction to them are likely to present exceptions rather than the norm in contemporary organizations.

Empirically, even factors that seem relatively proximal to creativity do not always exert consistent main effects. For instance, Grant & Berry (2011) narratively reviewed a number of studies on the link between intrinsic motivation and creativity and concluded that the effect is less consistent than theoretically expected (Amabile 1996). Likewise, organizational support for creativity does not render employees more creative across all studies (see e.g., Baer & Oldham 2006, Zhou & George 2001). Though cursory, these examples echo the aforementioned variability of findings in different meta-analyses and underscore the need to consider the interactive effects of actors and contexts to expand our knowledge about workplace creativity.

FROM CODETERMINATION TO INTERPLAY: A REVIEW OF EMPIRICAL RESEARCH ON THE INTERACTIONS BETWEEN ACTOR AND CONTEXT

Rationale for and Introduction of a New Typology

The insight that a joint consideration of actor and context as well as their interplay is needed to advance research on workplace creativity is not novel. Indeed, roughly 20 years ago, Woodman and colleagues (1993, Woodman & Schoenfeldt 1990) attempted to stimulate this line of research by proposing a framework in which the different types of influences interact with each other to affect creativity across different analysis levels and mutually shape each other. This notion aligns with other theoretical models. For instance, Amabile (1983, p. 358) emphasized "that creativity is best conceptualized [. . .] as a behavior resulting from particular constellations of personal characteristics, cognitive abilities, and social environments."

What has changed, however, is that researchers have increasingly responded to the challenge of empirically investigating this complex interplay. Whereas prior reviews often treated antecedents pertaining to the actor and the context in separate sections, a critical mass of recent studies focus on the nonadditive effects of these variables. The following review of this work reveals a staggering variety in the different interactional accounts that are suggested as explanations of what drives creativity at work. To organize this variety, we review the work using a relatively simple two-by-two scheme that differentiates between actor and contextual influences on the basis of their presumed or observed positive or negative impacts on creativity.

A few things are important to note with regard to our use of this classification scheme. Classifying factors as (potentially) promoting or enabling, as opposed to hindering or impeding, creativity is not always clear-cut. Whenever possible, we rely on the reported effects to make this differentiation. When lacking (conclusive) data, we aim to make an informed choice based on theoretical reasoning or the results of other studies or meta-analyses looking at the same factor. Likewise, in some cases, the distinction between actor and contextual variables is debatable. This is particularly true of variables that capture an actor's relationship with certain aspects of the context (e.g., LMX). In the differentiation between studies focusing on individual as opposed to collective creativity, context variables at the individual level may be actor characteristics at the collective level (e.g., team diversity). Finally, a substantial subset of studies provide interaction accounts that involve more than two variables and thus multiple context or actor factors. To classify these

papers, we assess whether the individual or joint impact of the multiple actor or contextual factors is positive or negative and focus on the effect of the focal variable in case the two factors have (potentially) countervailing effects. For example, George & Zhou (2007) studied the interplay of both positive affect and negative affect as actor factors with different forms of supervisory support as the context variable. Although negative affect has no consistently positive or negative effect on creativity, the dual-tuning account that the authors focused on in this paper highlighted the specific benefits arising from experiencing both positive and negative affect in combination, and these benefits were brought out by a supportive context. Accordingly, we classify the joint actor factors as positive and the context as supportive.

Despite these necessary specifications, in the absence of a preestablished framework to organize these interactions, the proposed model represents a parsimonious but exhaustive and comprehensive scheme to include a broad variety of published papers from this growing segment of the literature on organizational creativity. It avoids the a priori creation of categories that are theoretically possible but empirically missing. At the same time, using this basic scheme provides important insights on how it can be refined to better capture our current knowledge of how actor and contextual factors interact to impact creativity. Likewise, it reveals a number of blind spots for future research to address.

Taking Stock of Interactionist Research

The interplay of positive actor characteristics and supportive contexts. Given the comparatively larger number of studies on potentially positive actor characteristics and supportive contextual factors, it is not surprising that the majority of studies addressing the interactive effect of actor and context variables on individual and team creativity examine combinations of factors that are predominantly thought to benefit creativity.

Creativity as an individual outcome. Although leaders and supervisors may occupy a particularly influential position to promote the creativity of their employees, multiple studies highlight that the impact of leaders varies as a function of certain actor characteristics. Wang & Cheng (2010) showed that the positive effects of benevolent leadership on follower creativity in Taiwan depended on the follower considering creativity an important part of their role identity. In the United States, Wang & Rode (2010) found that the effect of transformational leadership was most positive when both employees' identification with their leaders and organizational innovative climate were high. When identification was low, the effect of transformational leadership was more positive at lower levels of innovative climate. In complement to these findings, Shin & Zhou (2003) demonstrated that the impact of transformational leadership on creativity was moderated by Korean followers' conservation values such that transformational leadership effect was more positive when followers had higher levels of conservation value. This moderated effect was mediated by followers' intrinsic motivation.

Conversely, leadership variables also bring out the creative benefits of certain actor characteristics. Several studies focus on the role of subfacets of transformational leadership in this regard. Zhou and colleagues (2012a) found that leader intellectual stimulation moderated the effect of employee promotion focus on creativity such that promotion focus had a more positive effect when leader intellectual stimulation was high than when it was low. Similarly, Hirst and colleagues (2009a) found that leader inspirational motivation and prototypicality independently (and jointly) moderated the effect of followers' team identification on creative effort. They found that team identification was more positively related to creative effort when leader inspirational motivation or (and) leader prototypicality was high.

Other studies stress the importance of different forms of supervisory support to harness the creative potential associated with different affective states. George & Zhou (2007) found that negative mood benefited creativity when individuals also had high levels of positive mood and worked in supportive contexts in which supervisors were trustworthy, provided developmental feedback, or displayed interactional justice. Crucially, they showed that creativity was highest among employees high in positive mood and negative mood and experiencing supervisory support. By contrast, To and colleagues (2012) focused on the role of positive activating mood for employees' propensity to engage in creative processes and found that positive activating moods more positively related to concurrent creative process engagement when individuals were dispositionally high in performance prove goal orientation and supervisory support was high. Interestingly, the benefits of positive activating moods were not found when only performance prove orientation was high yet supervisory support was lacking.

Under certain conditions, leaders can indirectly support creativity by empowering their employees. Zhang & Bartol (2010) showed that empowering leadership promoted psychological empowerment more strongly for employees with stronger as compared with weaker empowerment role identities. The effect of psychological empowerment on creative process engagement (which led to creativity) was more positive when leaders encouraged creativity. Findings by Jaussi & Dionne (2003) further suggest that group members who perceive their leader as a role model for creativity display more creativity when the leader engages in unconventional rather than conventional behavior.

Aside from leaders, teammates and coworkers form an omnipresent contextual influence that individual actors are exposed to and may benefit from creatively. Coworkers may provide a source of diverse knowledge and experiences that some individuals are more likely than others to use for their creative benefit. Shin et al. (2012) showed that perceived cognitive team diversity alone had no consistent effect on employee creativity but only contributed positively to creativity when the focal employee reported high levels of creative self-efficacy. Similarly, Baer (2010) found that the benefits of having a moderately sized and highly diverse network of weak ties emerged only for individuals high in openness to experience. Liao et al. (2010) examined the interplay of the quality of the exchange relationship between a focal team member with the other teammates [team–member exchange (TMX) quality] and the degree to which the quality of the relationship differed among team members (TMX differentiation). They found that TMX differentiation moderated the effect of an individual's TMX quality such that when members of a team differed in the relative quality of their relationship with their teammates, TMX quality had a positive effect on creative self-efficacy and a positive indirect effect on creativity through creative self-efficacy. When differentiation was low, TMX quality had neither a direct nor an indirect effect on creativity.

Whereas in the prior studies a positive actor factor was needed to bring out the benefit of a supportive context, other studies show how a positive actor factor can compensate for a lack of supportive context. Liu and colleagues (2011) found that the effect of unit support for autonomy on team members' creativity was moderated by the member's autonomy orientation such that the effect was less positive when the individual member had a high autonomy orientation. Liu et al.'s study 2 (but not study 1) also revealed a similar interaction between team support for autonomy and individual autonomy orientation, and all moderated effects were found to be mediated by members' harmonious passion.

A supportive team context also brings out the benefits of certain actor characteristics. Richter and colleagues (2012) found that the effect of individuals' creative self-efficacy depended on the surrounding team's shared understanding of who knew what and the team functional background diversity such that creative self-efficacy benefited creativity when the shared understanding was high and employees worked in functionally diverse teams. This indicates that the

knowledge about where to access certain information and the motivational inclination to do so may be beneficial to the extent that they promote access to diverse resources. Hirst and colleagues (2009b) report that team learning behavior moderated the effect of members' performance approach goal orientation on team member creativity. Specifically, the effect was positive at high, but not low, levels of team learning behavior. Their results also show that the potential of team learning behavior to bring out the creative benefits of members' learning goal orientation for their creativity was particularly strong at moderate levels of learning goal orientation. However, team learning had little impact on strengthening the link between learning goal orientation and creativity for those very high in learning goal orientation.

The extent to which an organization is generally supportive of creativity also appears to differentially affect the creativity of actors. For instance, Farmer and colleagues (2003) reported that individuals with creative role identities were more creative when they perceived the organization to value creativity, but these individuals showed lower levels of creativity than those with weaker creative role identities when they perceived such organizational support to be lacking.

Perceived recognition and rewards for creativity moderate the effect of affective states on creativity. George & Zhou (2002) investigated the effect of positive mood and of negative mood on creativity at varying levels of clarity of feelings and perceived recognition and reward for creativity. Their findings support the contention that similar contextual factors have markedly different effects depending on affective states and clarity about these states. The authors found that when clarity of feelings was high and employees perceived that they would be recognized and rewarded for creativity, positive affect (by signaling goal progress) had a negative effect on creativity and negative affect (by signaling a lack of goal progress) had a positive effect on creativity. Another study found that the impact of nonwork support on creativity was positive for employees low in creative personality, whereas this support had little effect on individuals who were dispositionally inclined toward creativity (Madjar et al. 2002). This suggests that some contextual factors can compensate for low levels of actor characteristics that promote creativity but the same contextual factors have limited benefits for those already more likely to engage in it.

The characteristics of the job or task itself may also shape the effect of person-level variables on creativity or have differential effects on the creativity of employees exhibiting different states or traits. In this regard, some studies illustrate how certain actor characteristics shape the extent to which demanding and complex jobs promote creativity (e.g., promotion focus, Sacramento et al. 2013; intrinsic motivation, Zhou et al. 2012b). For example, Zhou et al. (2012b) found that the effect of problem-solving demands on creative self-efficacy was moderated by employees' intrinsic motivation such that these demands had a positive effect on creative self-efficacy when employees were highly intrinsically motivated but had no effect on creative self-efficacy when employees reported low levels of intrinsic motivation. Creative self-efficacy mediated the effect of this interaction on creativity. In a complementary line of work, researchers have investigated how the (often inconsistent) effect of certain personality characteristics on creativity varies as a function of job and task characteristics (George & Zhou 2001, Keller 2012, Raja & Johns 2010, Shalley et al. 2009). For instance, George & Zhou (2001) found that employees exhibited the highest creativity when they were highly open to experiences, received positive feedback, and worked on tasks with unclear means or ends.

Creativity as a dyadic or team outcome. Despite the relative scarcity of research on the main effects of contextual influences on the creativity of dyads and teams, a growing set of papers analyze the interplay of contextual influences and the characteristics of the dyad or the team as the creative actor. Some studies show that certain leadership characteristics and styles are necessary to bring out the positive potential inherent in a team's informational resources, which otherwise remain without effect (Shin & Zhou 2007, Somech 2006, Sung & Choi 2012). An example is

Shin & Zhou's (2007) study showing that transformational leadership moderated the direct and indirect effect of educational specialization heterogeneity on team creativity such that educational specialization heterogeneity had a positive effect on team creative self-efficacy and creativity when transformational leadership was high rather than low. Moreover, leaders may bring out the benefits of collective motivational orientations for team creativity. Gong and colleagues (2012b) showed that having a trusting relationship with the leader moderated the indirect effect of team learning goal orientation on team creativity through team information exchange such that this indirect effect was positive when teams had a trusting relationship with their leaders, but it was not significant when trust was low. Interestingly, and underscoring the need to look at the interplay of the creative actor and the surrounding context, having a trusting relationship with the leader had the opposite impact on the indirect effect of a team's performance approach orientation on team creativity through information exchange. This effect was more positive when members reported a less-trusting relationship with their leader and more negative when the relationship with the leader was more trusting.

Characteristics of the broader context may also shape the effect of team characteristics on creativity (Giambatista & Bhappu 2010, study 2; Hargadon & Bechky 2006). Based on a qualitative study, Hargadon & Bechky (2006) presented an account of collective creativity as a momentary event that was more likely to occur when actors engaged in help giving, help seeking, and reflective reframing while working in a context that reinforced these behavioral patterns. This reinforcement (e.g., through positive experiences, shared values, encouragement, or explicit expectations) promoted the three behaviors and helped to contextualize and disambiguate the otherwise polyvalent meaning of behaviors like seeking and giving help.

At the same time, the effects of elements of the broader context are not necessarily uniform across different teams (e.g., Baer et al. 2010, Goncalo & Staw 2006, Sacramento et al. 2013). For instance, analogous to their individual-level findings reviewed above, Sacramento and colleagues (2013) found that the relationship between job demands and team-level creativity was moderated by team promotion focus such that the effect of demands on creativity was positive when teams had high levels of promotion focus but not when team-level promotion focus was low. Although a complementary logic predicting a moderating role of prevention focus was advanced, this effect emerged only at the individual (but not the team) level of analysis. Focusing on a different contextual characteristic, Baer and colleagues (2010) report that the effect of intergroup competition on team creativity was moderated by team membership change. In groups with stable membership, intergroup competition had a positive effect on team creativity when moving from low to moderate levels, but it had diminishing returns when moving from moderate to high levels of competition. Conversely, in groups with membership change, the effect of competition on creativity followed a U-shaped pattern with lower levels of creativity at moderate levels of intergroup conflict, suggesting that the incorporation of new members and the use of their resources suffered particularly under these conditions.

The interplay of negative actor characteristics and supportive contexts. In this section, we review studies that examine the interplay between (*a*) actor factors that have the propensity to restrict creativity and (*b*) contextual factors that may facilitate it. These studies provide interesting examples of how even individuals or teams that are not predisposed or inclined to be creative may do so to a larger extent given certain facilitative conditions.

Creativity as an individual outcome. Among the actor factors that may restrict or reduce creativity are stable individual differences such as certain personality attributes (e.g., the Big Five personality factors, Raja & Johns 2010; low creative personality, Zhou 2003), cognitive styles (e.g., Sagiv et al. 2010), prevention focus (Sacramento et al. 2013), values (e.g., conformity value;

Zhou et al. 2009), affect (e.g., Binnewies & Wörnlein 2011), psychological strain at home and at work (Van Dyne et al. 2002), job attitudes (e.g., job dissatisfaction; Zhou & George 2001), and behaviors (e.g., knowledge hiding; Černe et al. 2013).

Zhou (2003) found that supervisor close monitoring interacted with the presence of creative coworkers such that when creative coworkers were present, supervisors engaged in less close monitoring and employee creativity was greater. Interestingly, this two-way interaction effect was stronger for employees who were low in creative personality rather than high. In a similar vein, Sagiv and colleagues (2010) report results from two quasi-experimental studies that showed that lower levels of creativity for individuals with a more systematic (as opposed to intuitive) style occurred mainly for creative tasks that were largely unstructured. By contrast, creative task formats that provided structure rendered those with a predominantly systematic and those with an intuitive cognitive style equally creative. Conversely, the benefits of creative tasks with a larger amount of structure emerged mainly for individuals with a systematic cognitive style and not for those with a more intuitive cognitive style.

Zhou and colleagues (2009) showed that the characteristics of an employee's advice networks interacted with the focal actor's conformity values. Specifically, the number of weak ties had an ∩-shaped relationship with creativity for those who were low in conformity, but it was unrelated to creativity for those with high conformity values. The authors argued (*a*) that a moderate number of weak ties provided resources that individual employees could use for their creativity and (*b*) that employees high in conformity value were less likely to take advantage of this.

Van Dyne and colleagues (2002) examined the single and joint effects of work strain, home strain, and LMX on creativity. They defined strain as an employee's subjective experience of conflict or tension concerning relationships and responsibilities. Whereas both work and home strain were hypothesized to have a negative impact on workplace creativity, the authors found a negative relation only between home strain and creativity. Moreover, the effect of strain varied depending on the LMX quality. The negative effect of home strain was weaker when employees had a high-quality LMX relationship. Conversely, the effect of work strain on creativity was more negative when LMX quality was low.

Binnewies & Wörnlein (2011) examined within-person changes in creativity as a function of daily affect, with job control as a moderator. They found that positive affect in the morning had a direct positive impact on creativity. They also found an interactive effect between negative affect and job control such that when job control was high, negative affect in the morning had a positive effect on creativity, but when job control was low, negative affect had a negative effect on creativity. Job control did not interact with positive affect to influence creativity.

Zhou & George (2001) examined the conditions under which job dissatisfaction led to creativity. They found three three-way interactions such that job dissatisfaction positively related to creativity when both continuance commitment and either coworker useful feedback, coworker helping and support, or perceived organizational support for creativity were high. Černe and colleagues (2013) showed that knowledge hiding significantly decreased the knowledge hider's creativity and that this effect was moderated by motivational climate such that the effect of knowledge hiding on a person's own creativity was less negative when there was a strong mastery climate. In a lab study, the researchers further explored the underlying mechanisms. They found that the main and moderated effect of knowledge hiding on the knowledge hider's creativity was mediated by distrust of another person and in turn that person's own knowledge hiding.

Creativity as a dyadic or team outcome. To the best of our knowledge, no studies have examined dyadic or team creativity as a function of the interplay of detrimental actor and supportive contextual factors in the time frame we selected. Whether this reflects a substantive difference between

individuals and dyads/teams concerning the strength of supportive context effects and their potential to overcome detrimental actor factors or simply results from researchers' choice to consider other combinations of factors to a larger extent is difficult to tell.

The interplay of positive actor characteristics and unsupportive contexts. In complement to the studies reviewed above, some research has examined the interplay of actor factors that facilitate creativity and contextual factors that directly restrict creativity or indirectly hinder it by reducing the positive relation between the actor factor and creativity.

Creativity as an individual outcome. In this vein, Liao et al. (2010) studied the interplay of the LMX quality for a given team member and the extent to which the quality of the relationship with the leader differed among team members (LMX differentiation). They showed that LMX quality had a positive effect on creative self-efficacy and creativity and that there was an indirect effect of LMX quality on creativity through creative self-efficacy. LMX differentiation moderated this effect in an unexpected fashion. When differentiation was low (i.e., members did not differ strongly in the quality of their relationships with the leader), LMX quality had a positive effect on creative self-efficacy and a positive indirect effect on creativity. However, when LMX differentiation was high, LMX quality had neither a direct nor an indirect effect on creativity.

George & Zhou (2001) also investigated the effect of conscientiousness as moderated by different negative contextual factors on employee creativity and found a set of three-way interactions. Conscientiousness interacted with close monitoring and inaccurate communication from coworkers such that highly conscientious employees who worked under close monitoring while receiving inaccurate information from their coworkers exhibited the lowest level of creativity. Conscientiousness also interacted with close monitoring and unhelpful coworkers such that creativity was lowest when employees' conscientiousness, unhelpful coworkers, and close monitoring were all high. Finally, conscientiousness interacted with close monitoring and negative work environment such that employees were least creative when they were conscientious and worked in a negative work environment under close monitoring.

Baer & Oldham (2006) found a nonlinear three-way interaction between experienced creative time pressure, support for creativity, and openness to experience such that time pressure had an ∩-shaped relationship with creativity when support for creativity and openness to experience were both high. For individuals low in openness who received support for creativity, the effect of time pressure on creativity showed a linear negative trend. The same linear negative trend was found both for those who were low in openness to experience and received low support for creativity and for those high in openness but low in support for creativity.

Creativity as a dyadic or team outcome. Goncalo & Duguid (2012) conducted an experiment to test the joint effect of conformity pressure, norm content (individualism versus collectivism), and team members' creative personality on the rated creativity of the ideas generated by groups. They found a two-way interaction between creative personality and conformity pressure such that the effect of conformity pressure was negative for teams with more creative members but not for teams composed of members with less creative personalities. This interaction was qualified by a three-way interaction between conformity pressure, norm content, and members' creative personality. Specifically, individualistic norms led to higher creativity under conditions of high conformity pressure in teams composed of less creative members, whereas groups composed of highly creative members produced more creative ideas under an individualistic norm when conformity pressure was low.

Giambatista & Bhappu (2010) tested the joint effects of agreeableness, openness, ethnic diversity, and communication technology (computer-mediated communication, nominal group technique,

and face-to-face communication) on group creativity. Arguing that certain communication techniques have the potential to inhibit the negative social categorization effects associated with some diversity dimensions while catalyzing the beneficial information-related effects inherent in diversity, the authors found a complex pattern of interactions suggesting specific benefits of specific communication technologies for particular diversity attributes.

Gajendran & Joshi (2012) studied innovation in globally distributed teams. They found that LMX quality interacted with communication frequency in its effect on influence on decision making such that LMX quality had a positive effect on influence on decision making when communication frequency was high but no effect when communication frequency was low. Additionally, the authors found a three-way interaction between team dispersion, LMX, and communication frequency: At high levels of communication frequency, LMX had a more positive effect on influence on decision making when dispersion was high, whereas dispersion did not moderate the effect of LMX on member influence at low levels of communication frequency. Team-level influence on decision making in turn positively affected team innovation.

The interplay of negative actor characteristics and unsupportive contexts. Last but not least, a small set of studies have explored the interplay of (*a*) actor states or traits that are detrimental for creativity and (*b*) unsupportive or actively hindering contextual factors.

Creativity as an individual outcome. Liu and colleagues (2012) showed that leaders may actively harm their followers' creativity through abusive supervision. The authors found that this negative effect was particularly pronounced when followers strongly attributed the abusive supervision to a leader's motive to harm them and less to an intent to promote their performance. Conversely, the effect of abusive supervision was weaker when team members attributed it less strongly to the leader's intent to harm them and more strongly to his or her intent to elicit higher performance. Other research points to the role of contextual factors in exacerbating the negative influence of certain behaviors of the creative actor. In this regard, Černe and colleagues (2013) provided results from a field and a laboratory study indicating that knowledge hiding significantly decreases the knowledge hider's own creativity by eroding trust and prompting others to reciprocate in kind. They found this effect to be particularly strong when knowledge hiding occurred in a motivational climate that emphasized performance. Hirst and colleagues (2011) studied the extent to which two key features of the bureaucratic context of a team (i.e., the centralization of power and authority and the formalization of procedures through explicit rules) shaped the impact of members' performance avoid goal orientation on a focal member's creativity in Taiwanese customs teams. Interestingly, the authors found that centralization and formalization had different moderating effects on the relationship between performance avoid orientation and team member creativity. Whereas centralization accentuated the negative effect of performance avoid orientation on creativity, formalization attenuated it.

Creativity as a dyadic or team outcome. Regarding teams, Pearsall et al. (2008) showed that gender faultlines interacted with contextual cues to activate the faultline (i.e., a gender-biased or gender-neutral task) to predict team creativity: Gender faultlines reduced creativity only when the task activated the faultline.

DISCUSSION

Insights from and Implications of the Reviewed Actor–Context Interaction Research

We organized our review based on the valence of the actor and contextual factors contributing to the respective interactions. Using this typology to take stock of the growing interaction-based

research on individual and team creativity yields various interesting insights. First, a comparison of the factors involved in studies that focus on the actor or on the context alone with the factors found to be part of an interactive actor–context account shows substantial overlap. To illustrate, the majority of the factors reviewed in the section targeting the contextual influences on creativity are found to interact with actor characteristics. This includes the effects of job characteristics (e.g., Raja & Johns 2010), rewards (e.g., George & Zhou 2002), supervisory behaviors and leadership styles (e.g., Shin & Zhou 2003, Zhou et al. 2012a), time pressure (e.g., Baer & Oldham 2006), social network characteristics (e.g., Baer 2010), organizational climate (e.g., Wang & Rode 2010), and support for creativity (e.g., Madjar et al. 2002), to name just the most commonly studied factors. Interestingly, these boundary conditions not only are observed for somewhat remote actor- or context-level antecedents but also are frequently found for explicitly creativity-related, proximal antecedents such as creative personality (e.g., Zhou 2003) or creative self-efficacy (Richter et al. 2012). Moreover, a substantial set of studies find that the effect of a certain antecedent is contingent on multiple actor and contextual influences. This underlines the crucial role of an interactionist theoretical perspective for developing an in-depth understanding of antecedents of creativity in the workplace.

Second, the majority of research on workplace creativity has focused on factors that are potentially positive rather than those that may hinder or reduce creativity. This might be owed in part to the phenomenon itself. Creativity is often seen as a somewhat rare outcome that at times extends beyond the employee's job description, is especially prone to disruptions, and requires careful nurturing. This insight also reflects the strong desirability of creativity both in the scientific community and within managerial practice. Yet, this understanding of how to promote creativity could be complemented with an intensified study of potentially negative factors and the contingencies surrounding their effect on creativity. Research has demonstrated a relatively widespread asymmetry between the impact of negative factors and their positive counterparts (e.g., feedback, emotions), with negative factors often exerting stronger or more lasting effects (Baumeister et al. 2001). Moreover, a predominant focus on positive antecedents might not adequately reflect the situation creative actors face in all organizations, or accurately describe the stable characteristics and more transient states with which creative actors come to work. Turning a blind (or at least myopic) eye to these factors means forgoing the opportunity to detect existing contextual barriers and inhibitors that might be removed to benefit workplace creativity for certain actors or to identify conditions that allow those actors that are ceteris paribus less inclined to engage in creative behaviors to perform more creatively.

Some interactions involving negative actor or contextual factors suggest that this is more than a hypothetical benefit. Černe et al.'s (2013) study of the effects of knowledge hiding and Liu et al.'s (2012) account of the trickle-down effects of abusive supervision not only target phenomena that may occur with some regularity in organizations but also point to factors that can ameliorate their negative repercussions. Moreover, Raja & Johns' (2010) finding that the effect of neuroticism on creativity was contingent on job scope, such that more neurotic individuals were more creative when working under conditions of low job scope, suggests that in some cases, the combination of two negative factors may be conducive to higher creativity.

Third, a comparison between studies at the individual and those at the team level also reveals a specific blind spot with regard to investigating contextual influences on dyadic or team creativity. This may relate to the difficulty of obtaining data that speak to the role that contextual factors play in team creativity. Yet studying the impact of contextual factors on collective creativity might prove particularly interesting. For one thing, there are reasons to suggest that a team acts as a powerful filter in the perception and processing of contextual influences on the team and its members (Hinsz et al. 1997), rendering the impact of contextual factors potentially more

variable and malleable. For another, at the team level these interpretative processes do not occur only in the members' minds but are shared through communication, making them observable (e.g., through video recordings, digital communication records, or direct observation). This creates unique opportunities to study the mechanisms through which contextual factors exert their influence.

The limited number of factors studied at both levels of analysis renders premature a general conclusion as to whether creativity is an isomorphous construct across levels of analysis that displays homologous relations with a broad range of antecedents. Aside from the limited empirical base available to support such a conclusion, a number of conceptual considerations suggest that this homology should not be readily assumed (Hoever 2012). For instance, although it is reasonable to believe that variables representing the central elements of domain-relevant knowledge, creativity-relevant processes, and intrinsic motivation in Amabile's (1996) componential model of creativity exert important influences on team creativity as well, qualitatively different concepts emerge for each of these components when moving from the individual to the team level. For instance, team-level domain-relevant knowledge includes not only the sum and range of knowledge present within a team but also its distribution between members. A few studies reviewed here support the notion that this renders the effect of team knowledge resources on team and individual creativity more remote and contingent on other factors, including leaders (e.g., Shin et al. 2012, Shin & Zhou 2007, Somech 2006, Sung & Choi 2012), team member behaviors (Hoever et al. 2012a), or the actor's creative self-efficacy (Shin et al. 2012). Taggar (2002) also provides an account of how team creativity–relevant processes, including communication and coordination processes, are needed to effectively use the relevant knowledge and ideas that are distributed among many heads. As such, our review suggests that at the team level, both actor and contextual effects are more strongly contingent on the nature of the corresponding context or actor. Ultimately, systematic research comparing the effects of the same antecedents on creativity across levels of analysis is needed to conclusively answer this question (cf. Zhou & Shalley 2008a).

Refining the Typology and Future Research Directions

Our review also points to a need to refine the conceptualization of actor–context interactions. With its core argument that creativity occurs at multiple levels in organizations and is codetermined by actor and context variables, Woodman et al.'s (1993) interactionist model of creativity constituted an important stimulus for the then nascent research on workplace creativity. The impressive amount of studies providing specific accounts of how workplace creativity is indeed an example of how "the behavior of an organism at any point in time is a complex interaction of the situation and [. . .] the nature of the organism itself" (Woodman & Schoenfeldt 1990, pp. 279–80) attests to the model's impact in setting the agenda for an important area of organizational creativity research.

Following the general thrust of Woodman et al.'s model stressing the codetermination of workplace creativity through actor and contextual factors, we structured our review of the respective research by focusing on the nature of the factors involved in the interaction. To a certain extent, this approach allowed us to trace the evolution of the field from a focus on main effects and the separate consideration of either context or actor characteristics to a more integrative consideration of both types of factors and their interplay. Yet the results of this review underscore the need to further refine our understanding of this interplay. An interactionist perspective inherently entails more than the joint, additive codetermination of workplace creativity through actor and context or the interrelatedness of actor and context factors. It additionally acknowledges the potential of each class of factors to shape the effects of the respective other class of factors on

creativity. But Woodman and colleagues (1993) did not specify the different forms that this interplay can take.

Further detailing the nature of these interactions is important. Our review shows that a broad classification of the interactions based on the constituent factors alone leads to systematic variation within each of the resulting categories. This is particularly evident when focusing on the categories formed by actor and contextual factors of the same valence for which the combination of high levels of two or more positive or negative factors does not reliably yield the highest or lowest levels of creativity. In some cases, individually positive or negative actor factors cancel each other out in their effects or jointly create an effect of the reverse direction. This variation provides a good starting point because it suggests that the understanding gained by classifying interactions based on the nature of the involved factors should be complemented by a more fine-grained conceptualization of the nature of their interplay. To constructively extend our review, we suggest the following refined typology of interactions that takes into account both the nature of the factors and the specific pattern of their interplay.

For factors of the same valence, we suggest that a number of interaction types cover the range of results from prior research. The first comprises cases in which two factors with individually positive effects/potential jointly affect an individual in such a way that their positive effects are mutually enhanced in a synergistic way. An example is Zhang & Bartol's (2010) account of how psychological empowerment had a stronger positive effect on creative process engagement (which in turn predicted creativity) when leaders strongly encouraged creativity, but a weaker, but still positive, effect when this encouragement was weak. In other cases, the positive moderating factor may be needed to activate the benefit of the independent variable. For instance, Richter et al. (2012) found that the effect of individual self-efficacy on creativity was contingent both on the knowledge resources available to the team and on an adequate meta-cognitive representation of its distribution. Conversely, in interactions involving two negative factors, the moderator may increase the detrimental effect of the independent variable, thus working in an antagonistic mode. An example of mutually reinforcing negative factors is the interaction between abusive supervision and attributed injury initiation motives reported by Liu et al. (2012). The effect of abusive supervision on creativity was particularly detrimental when individuals saw the abuse as reflecting their leaders' intent to inflict harm.

Alternatively, a moderator that shares the same basic effect on creativity as the independent variable may create boundary conditions for the effect of the independent variable. When the independent variable and the moderator are (potentially) positive, the result is a pattern that can be described as diminishing gains. An example of this pattern is Madjar and colleagues' (2002) finding that nonwork support for creativity had a positive effect for employees with low levels of creative personality but provided little additional value for employees with high levels of creative personality. Conversely, interactions involving independent variables and moderators that have a (potentially) negative effect may result in a pattern in which the independent variable has no additional negative effect on creativity at low levels of the moderator, thus yielding a pattern of diminishing losses. An example of this pattern is Hirst and coauthors' (2011) finding that the negative effects of performance avoid goal orientation emerged at low levels of formalization, but not when formalization was high, that is, with explicit rules on how to act for all actors.

Finally, moderators of the same valence as the independent variable may reverse the independent variable's effect. Although this pattern may be rare, it is potentially interesting, especially with regard to creativity, which is frequently considered to require a balance between divergence and convergence even though factors promoting divergence are largely seen as facilitative of creativity. Illustrating the point that the combination of two factors that may individually promote divergence jointly reduce creativity, Hoever and colleagues (2012b) found that

informationally diverse teams in the laboratory were more creative after receiving negative feedback, whereas positive feedback promoted the creativity of homogeneous teams.

For those interactions involving factors of individually opposing effects on creativity, two basic patterns may emerge. On one hand, a moderator with an individually negative effect can nullify or inhibit the otherwise positive effect of an independent variable. An example of this inhibitory interactive pattern is Hirst and colleagues' (2011) finding that high levels of centralization neutralized the otherwise positive effect of learning goal orientation on creativity. Conversely, moderators with a potential positive effect on creativity may provide remedial resources or alternatively reduce or even reverse the effect of an independent variable with an individually negative effect. Zhou & George's (2001) finding that job dissatisfaction actually had a positive effect on creativity when both continuance commitment was high and supportive contextual conditions such as coworker helping, coworker feedback, or perceived organizational support for creativity were given represents an example in this regard.

Reflecting our earlier caveat that some factors are hard or even impossible to classify as positive or negative, a final type of interaction, called configurational, involves certain factors that are not individually helpful or harmful but that specifically promote or hinder creativity in particular configurations with other factors. One example of this are interactions involving largely neutral factors such as time that have no direct effect on creativity but may render the effect of other variables more or less positive. For instance, Farh and colleagues (2010) found that the effect of task conflict on team creativity was contingent on the project phase a team was in. **Figure 1** is a parsimonious visual representation of our new typology. Note that in the figure, "context" could be a single contextual factor or a combination or interaction between multiple contextual factors. Likewise, "actor" could be one actor characteristic or multiple characteristics.

This extended conceptualization incorporating the nature both of the factors and of the interplay between them entails a number of potential benefits. First, it leaves room to incorporate factors that are not inherently positive or negative. As one key takeaway from this review is that uniform main effects are rare, such open-ended classification is likely to apply to a broader range of factors beyond the structural variables of time or project phase studied in the mentioned example of a configuration interaction. Moreover, it allows us to capture meaningful variance in the creativity resulting from a combination of different factors that is not captured by the effects associated with the individual factors themselves. Likewise, by alerting researchers to the existence of this variability, we hope to stimulate theory building on the conditions under which different factors interact synergistically, yield diminishing returns, or reverse their effects. Finally, from a managerial standpoint, the extended conceptualization highlights that for a complex phenomenon like creativity, different measures to promote creativity need to be coordinated carefully to avoid situations in which measures that might have individual merit combine either to yield either diminishing returns or even to create detrimental joint effects.

Beyond the needs identified by the gaps we exposed above as well as the study of when different interaction patterns occur, our review points to another future research direction. One type of context, the cultural context in which creativity takes place, deserves particular future attention. The good news is that the reviewed studies involve a wide variety of national backgrounds, including samples from, among others, Bulgaria, Canada, China, Germany, Israel, Korea, Portugal, Slovenia, Sweden, Taiwan, the United Kingdom, and the United States. The slightly less good news is that the existing research allows for little systematic comparison of how different factors play out across different national or cultural contexts, as there is limited overlap between the factors and combinations of factors studied in different national settings. This leaves considerable room for improvement in our understanding of how cultural factors affect creativity and its relationship with its antecedents. Among the many avenues for future research in this regard, one particularly

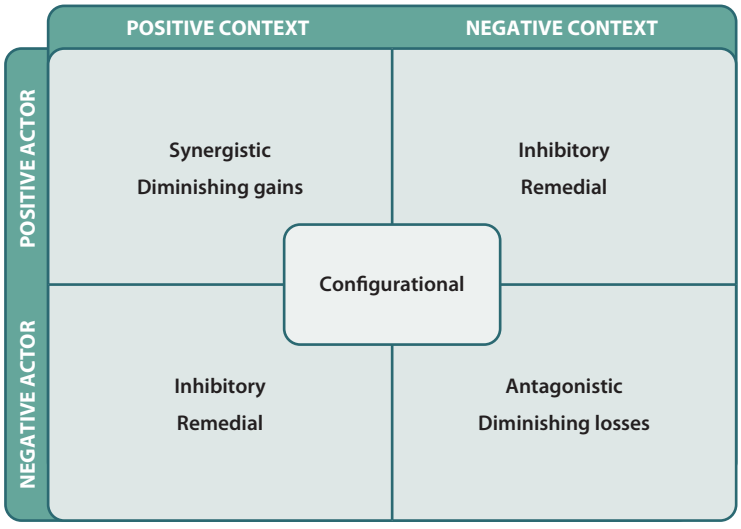

Figure 1

A new typology describing actor–context interaction effects on creativity.

promising route would be to compare the effect and nature of actor–context interactions across cultures of varying degrees of cultural tightness and looseness (Gelfand et al. 2006). In line with the interactionist approach advanced here, the degree of cultural tightness might impact the extent to which contextual influences (*a*) vary as a function of actor characteristics, (*b*) show strong differences between actual and perceived context, and (*c*) outweigh actor-level factors. Additionally, research on the factors that allow individuals to effectively collaborate and achieve creative outcomes in multicultural settings (e.g., Chua et al. 2012) may prove a promising avenue for future studies.

CONCLUSION

Research on workplace creativity has burgeoned over the past decades and increasingly represents a research domain in its own right. Adopting an organizational focus on the study of creativity entailed an increasing consideration of contextual influences. The gradual extension of antecedents from dispositional or stable actor characteristics, to more transient motivational, affective, or cognitive states separately or in conjunction with their contextual antecedents, to ultimately, the interactive effect of different actor and contextual factors illustrates this development. This body of research evidence provides additional managerial implications. For example, it suggests that relying on selection to promote creativity is unlikely to achieve intended results. This is because our review of work on creative actors in unsupportive contexts suggests that even when organizations have selected and hired employees who have the natural inclination to be creative, if the organizational context is unsupportive the employees' creative potential will not be realized. Conversely, our review of work on noncreative actors in supportive contexts suggests that when managers create an environment that supports creativity, even employees who lack the natural inclination to be creative may become creative. As another example, our review suggests that leadership plays a key role in forming a supportive context for creativity. Hence, organizations should train their managers to exhibit the type of leadership or supervisory behaviors that nurture instead of inhibit employee creativity.

Studying the manifold ways in which actors and contexts jointly impact the creativity of employees and work groups remains a challenge for future organizational research. Ensuring that these results ultimately form part of a larger understanding of what drives creativity at work, which may form the basis for actionable advice for practitioners, ultimately will require a more systematic understanding of the different ways in which actors and contexts interact. The present review provides only one more step in this direction. To stimulate future theorizing and research in this regard, we provide a list of recommendations below.

RECOMMENDATIONS FOR FUTURE THEORIZING AND RESEARCH

1. Conduct research on the impact of negative actor and contextual factors as well as ways to overcome them.
2. Discover key actor and contextual factors for creativity that have not been documented in the creativity literature, especially factors that have differential effects on different types of creativity.
3. Intensify research efforts examining the contextual effects on collective creative outcomes.
4. Systematically address the extent to which the relationships between creativity and its antecedents are homologous across different levels of analysis by conducting research that simultaneously examines effects at different levels.
5. Advance theory and conduct empirical research predicting the types of interplay proposed in this review (i.e., synergistic, antagonistic, inhibitory, remedial, and configurational interactions and those showing patterns of diminishing gains and diminishing losses).
6. Study the mechanisms through which the various types of actor–context interactions proposed here affect creativity.
7. Study systematic differences in the effects of certain actor variables and team- or organization-specific contextual factors as a function of characteristics of the broader context (e.g., profession, industry, culture).
8. Explicate hidden actor and contextual factors that are not part of the research model in a focal study but nevertheless are characteristics of the sampled actors or contexts, so as to facilitate the integration of different research efforts through meta-analyses and reviews.

DISCLOSURE STATEMENT

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