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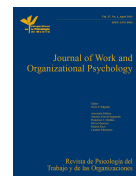
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Tensions and Paradoxes in Creativity and Innovation

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ABSTRACT

Most often understood as the generation of novel and useful ideas and their implementation, research on creativity and innovation has mushroomed in recent years. Although these studies provided useful insights into how organizations can enhance both phenomena, there is a growing consensus in the literature suggesting that rather than inherently beneficial, creativity and innovation are in fact ripe with tensions and competing demands. These tensions may put individuals and teams under pressure as they try to a) come up with novel, but also useful and implementable ideas, b) complete their core tasks efficiently, but also suggest novel and useful ideas for their improvement, and c) bring uniqueness to the table, but at the same time form cohesive collectives. In this integrative review, we illustrate these tensions with research evidence and provide recommendations about how we can manage them in order to benefit from individual and team creative and innovative efforts.

Las tensiones y paradojas en la creatividad y la innovación

RESUMEN

A menudo entendida como la generación de ideas innovadoras y útiles y de su puesta en práctica, la investigación en creatividad e innovación ha prosperado en los últimos años. A pesar de que estos estudios hayan aportado luz sobre cómo pueden las empresas mejorar ambos fenómenos, cada vez hay mayor consenso en la literatura que indica que más que intrínsecamente favorables, la creatividad y la innovación están de hecho plagadas de tensiones y exigencias enfrentadas. Las tensiones someten a las personas y equipos a presión cuando tratan de: a) conseguir ideas innovadoras, y también útiles y que sean aplicables, b) finalizar sus principales tareas eficazmente y c) aportar originalidad, a la vez que forman colectivos cohesionados. En esta revisión integradora ilustramos estas tensiones con pruebas de investigación y damos recomendaciones sobre cómo podemos manejarlo para sacar provecho de los esfuerzos creativos e innovadores individuales y de equipo.

Palabras clave:

Creatividad
Innovación
Tensiones
Paradojas
Exigencias enfrentadas

Associated with success, progress, performance, efficiency, satisfaction, and sustainability (e.g., Kuzma et al., 2020; Rosenbusch et al., 2011), creativity and innovation have been an integral part of our lives. Without creativity and innovation we would not have accessible technological devices, such as smartphones or innovative foods, such as those that support nutritious plant-based diets. We would not have intriguing TV shows to watch or entertaining books to read. Indeed, different stakeholders across different walks of life consider creativity and innovation as desirable and beneficial phenomena. It is therefore not surprising that creativity and innovation have been widely studied across diverse disciplines, ranging from engineering (e.g., Howard et al., 2008), creative arts (e.g., Campbell, 2019), anthropology (e.g., Ufer & Hausstein, 2021), and management (e.g., Bammens et al., in press; Rosenbusch et al., 2019) to different areas

of psychology, such as developmental (e.g., Bazhydai & Westermann, 2020), cognitive (e.g., Baas et al., 2015), social (e.g., Nijstad & Stroebe, 2006), and work and organizational (e.g., Anderson et al., 2014).

In work and organizational psychology, creativity and innovation have most often been defined as “the process, outcomes, and products of attempts to develop and introduce new and improved ways of doing things.” (Anderson et al., 2014, p. 1298). Other definitions essentially refer to creativity and innovation along these similar lines (e.g., Amabile & Pratt, 2016; Anderson et al., 2004; Harvey & Berry, in press; Oldham & Cummings, 1996; Paulus & Nijstad, 2003; West, 1990; Zhou & Shalley, 2008), which is that creativity is about generating novel and useful ideas and innovation is about implementing these creative ideas into new services, products, or processes. Some authors have suggested that it is useful to distinguish “small c”, mundane,

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and everyday creativity from “big C” creativity, which involves major breakthroughs and the work of creative geniuses (e.g., [Gardner, 1993](#); [Gilson & Madjar, 2011](#); [Mumford & Gustafson, 1988](#)). In the end, however, all these definitions essentially suggest that creativity and innovation are inherently positive and beneficial for individual employees, work teams or departments, organizations, and societies as a whole.

However, going against the status quo and thinking outside of the box, both of which are inherent to idea generation and implementation, are also intrinsically linked with failure, experience of stress, uncertainty, ambiguity, perceptions of “otherness”, disruption, and so on ([Janssen, 2003](#); [Potočník et al., 2020](#)). Creativity and innovation are also underpinned by inherent tensions and conflicting demands, because they require both novelty “and” usefulness, which might be in tension (e.g., as per the balance perspective of creativity; [Harvey & Berry, in press](#)). They also necessitate both divergent “and” convergent thinking, which by their very definitions are opposing cognitive processes ([Nijstad et al., 2010](#)).

Against this backdrop, the research in work and organizational psychology has started to acknowledge that, rather than universally positive and beneficial, creativity and innovation are paradoxical phenomena, surrounded by tensions, dilemmas, and trade-offs that employees and teams face when they engage in different activities that are necessary for both novel and useful idea generation and implementation ([Bledow et al., 2009](#); [González-Romá & Hernández, 2016](#); [Harvey & Berry, in press](#); [Nijstad et al., 2010](#); [Potočník et al., 2020](#)). For instance, both idea generation and implementation might be simultaneously enabled by desirable and less desirable factors (e.g., positive and negative moods, resources and demands, facilitators and constraints; e.g., [Acar et al., 2019](#); [De Dreu et al., 2008](#); [Tierney & Farmer, 2011](#)), and might lead to both positive and negative outcomes across multiple levels of analysis (e.g., better team and organizational performance but poorer individual well-being or vice versa; [Potočník et al., 2020](#)). Employees and managers might also face trade-offs when performing their everyday routine tasks and engaging in creative and innovative behaviours at the same time, because these different activities require different types of resources and behaviours ([Potočník et al., 2015](#)). However, despite this growing consensus on the paradoxical nature of organizational creativity and innovation, the majority of research in our field has predominantly studied both from a universally positive and beneficial perspective, neglecting the so-called dark side of creativity and innovation ([Anderson et al., 2014](#)).

In order to move this emerging perspective on organizational creativity and innovation forward, we conducted an integrative review of the most representative research evidence around paradoxical nature of creativity and innovation. For the purpose of this review, we conceptualize creativity and innovation in terms of two broader stages, referring to idea generation and idea implementation, and expect that there can be tensions within and between both stages due to the fact that they are underpinned by opposing cognitive processes ([Nijstad et al., 2010](#)). Further, we take on a balance perspective that has been recently advanced by [Harvey and Berry \(in press\)](#), and posit that idea generation involves both idea novelty and usefulness, which might also be in tension. Although these authors have argued that novelty and usefulness could also be considered as separate dimensions or one overall dimension of creativity that can be maximized independently (“maximization perspective”) or considered jointly (“integration perspective”), we focus on the balance perspective, because this perspective is consistent with our approach to both creativity and innovation as paradoxical phenomena (see [Anderson et al., 2014](#); [Montag et al., 2012](#); [Zhou & Hoever, 2014](#); [Zhou et al., 2019](#), for comprehensive reviews of creativity and innovation research that has been largely underpinned by maximization and/or integration perspectives).

Our paper unfolds as follows. We first review relevant theoretical frameworks that can address and explain different

sources of tensions and competing demands in both phenomena. We then pay attention to tensions and competing demands at the individual and team levels, respectively, and explain the sources of tensions at each level and integrate key research evidence around some of these tensions. Although similar tensions play out at the organizational level, we focus our attention on the individual and team levels as most of the creativity and innovation research in work and organizational psychology has been conducted there. We conclude our review with agenda for future research on how to address and manage the paradoxical nature of creativity and innovation for the benefit of diverse stakeholders.

Theoretical Foundations and Frameworks

Scholars in work and organizational psychology have advanced a number of different frameworks and theories to study creativity and innovation, but only a few of them have addressed their paradoxical nature. We identified five theories that could explain different tensions and competing demands in creativity and innovation, with some of them stemming from broader business and management studies ([Smith & Lewis, 2011](#); [Tushman & O'Reilly III, 1996](#)). These theories are a) dual-pathway model, b) dynamic componential model, c) idea journey and social network drivers model, d) theory of paradox, and e) ambidexterity theory. Although these theoretical frameworks may appear very disparate, they all provide insightful arguments that can explain the sources of tensions in individual and team creativity and innovation.

Dual-pathway to Creativity Model

Building upon earlier cognitive theories of creativity, the dual-pathway model argues that creativity involves both cognitive flexibility and cognitive persistence, and explains how different individual and contextual factors shape the generation of novel and useful ideas either by exerting their influence on flexibility, persistence, or both. As such, the dual-pathway model suggests that creativity is a result of two different pathways – a “flexibility pathway” and a “persistence pathway” ([De Dreu et al., 2008](#); [Nijstad et al., 2010](#)).

Unlike other theories of creativity, the dual-pathway model offers rich and nuanced theorising that explains how two seemingly competing cognitive processes – flexibility and persistence – both influence creativity. Whereas cognitive flexibility refers to the extent to which individuals are able to switch between and/or consider different perspectives, cognitive persistence is defined as the extent to which individuals engage in “sustained and focused task-directed cognitive effort” ([Nijstad et al., 2010](#), p. 42). The flexibility pathway leads to greater creativity when individuals are able to associate distant ideas and use broad and inclusive cognitive categories and can easily and flexibly switch between them. The persistence pathway results in greater creativity when individuals can systematically explore a handful of ideas in-depth. Both pathways are in tension because connecting distant ideas and generating broad categories is dysfunctional when it comes to focused and analytical search and pursuit of a few novel, but also useful ideas. The dual-pathway model recognizes that both pathways are not exclusive, since individuals over the course of generating novel and useful ideas can switch between flexible and systematic thinking styles.

Further, this model argues that a) some individual and situational factors have a stronger impact on either flexibility or persistence and b) some of these factors may in fact have opposite effects on flexibility and persistence. As such, the dual-pathway model helps us explain and reconcile the contradictory and/or inconsistent findings around the predictors of creativity as it can explain why some individual traits and states may lead to greater creativity either by influencing

cognitive flexibility or cognitive persistence or both. Focusing on the role of moods in particular, the dual pathway model differentiates between both hedonic tone and activation level and predicts that positive and activating moods, such as happiness, make individuals feel safe and more carefree, which in turn leads to the exploration of new ideas in a more flexible way. Therefore, positive and activating moods are expected to lead to greater creativity by positively influencing cognitive flexibility. In contrast, negative and activating moods, such as anger, are more likely to make individuals react by searching for specific solution to problems, which necessitates more systematic and analytical thinking. Therefore, negative and activating moods are expected to positively influence creativity by exerting a positive influence on cognitive persistence (De Dreu et al., 2008; Nijstad et al., 2010). These ideas are similar to what is argued in the dual tuning perspective on affect by George and Zhou (2007).

This model also helps us reconcile inconsistent findings around deactivating moods of any hedonic tone, such as feeling relaxed or sad. Namely, the dual pathway model suggests that a certain level of cognitive activation and arousal is necessary to trigger either cognitive flexibility or persistence and, hence, either positive or negative de-activating moods will less likely enhance creativity. The dual pathway model should indeed help researchers study meaningful, theory-driven hypotheses around seemingly contradictory effects of different individual and contextual factors on creativity (see, for instance, Baas et al., 2013 for a study on personality traits).

Dynamic Componential Model of Creativity and Innovation

The dynamic componential model is the most recent iteration of Amabile's (1983, 1988, 1996) widely referenced componential theory of creativity and innovation. This revised model outlines the role of meaningful work, affect, and synergistic extrinsic motivation in achieving creative and innovative outcomes, which can be assessed in terms of success, failure, or progress. Further, it proposes five stages of the creative process, including task presentation and preparation, idea generation and validation, and outcome assessment, and theorizes around the importance of progress loops in this process (Amabile & Pratt, 2016). These progress or feedback loops explain how multiple iterations are likely necessary in creative process to reach a satisfactory creative or innovative outcome. The revised theory acknowledges that failure is inherent to creativity and innovation and that individuals and small teams learn how to improve their creative and innovative attempts by going through various stages of the creative process multiple times. Meaningful work, amongst other ways of shaping creativity and innovation, is important because it helps employees and teams persevere with their creative and innovative attempts in the face of uncertainty and failure.

In terms of affect, this model argues that we should look at how affect is triggered by different creative and innovative outcomes (i.e., success, failure, or progress) and that all types of affect – positive, negative, and ambivalent – might facilitate creativity and innovation, although to different degrees and at different stages of creative process. The model argues that positive affect performs a motivational function and as such should facilitate intrinsic motivation. Because intrinsic motivation is particularly important in the first (i.e., task presentation or formulation of the problem) and third stage (i.e., idea generation), so is positive affect. Although this model does not explicitly refer to the activating mechanism of moods and affect like dual-pathway model does, Amabile and Pratt (2016) have argued that positive affect is key for idea generation because it broadens cognitive associations, which improve the novelty of generated ideas. In contrast, negative and ambivalent affect are expected to be the most influential in the second (i.e., preparation that involves gathering resources and information) and fourth stage (i.e.,

idea validation) of the creative process, because they are expected to improve the usefulness of creative and innovative outcomes. Similarly to the dual-pathway model, this model suggests that negative affect can help people engage in detail-oriented, analytical, and critical thinking, which is necessary for gathering resources and validating ideas (Amabile & Pratt, 2016). Similar mechanisms might be triggered by ambivalent affect, except that due to its association with cognitive flexibility, ambivalent affect might also be related with idea generation in the third stage of this model.

Regarding the role of motivation, the dynamic componential model still argues that intrinsic motivation is key to creativity and innovation. However, unlike Amabile's (1983, 1988) initial model, this model also suggests that extrinsic motivation plays an important role in creativity and innovation when there is synergy between specific types of extrinsic and intrinsic motivation (Amabile & Pratt, 2016). For instance, compared to “controlling” extrinsic motivators (those that make individuals feel controlled by external environment), “informational” extrinsic motivators (those that provide information confirming individuals' competence or value of their work) are more likely to be in synergy with intrinsic motivation (Deci & Ryan, 1985). From this perspective, any external factor that offers information and confirms individuals' sense of self-competence and allows them deeper involvement with their work would constitute a “synergistic extrinsic motivator” and would have an additive effect with intrinsic motivation on creativity and innovation.

Taken together, the revised, dynamic componential model of creativity and innovation (Amabile & Pratt, 2016) offers theoretical insights that can help us reconcile some of the tensions and paradoxes in innovation and creativity, particularly around the role of negative, positive, and ambivalent affect and extrinsic and intrinsic motivation.

Idea Journey and Social Network Drivers Model

Taking on a social networks lens, Perry-Smith and Mannucci (2017) have recently developed a model that can address some tensions in individual creativity and innovation by addressing both phenomena in terms of an idea journey and outlining different needs that individuals have at different stages of this journey. They propose that creativity and innovation unfold along four stages, starting with idea generation, followed by idea elaboration and idea championing, and ultimately idea implementation. Different needs that individuals have at each of these stages comprise cognitive flexibility, support, influence, and shared vision. In the idea generation stage, individuals aim to come up with a core concept of the idea, and to this end they need cognitive flexibility or “the ability to shift schemas and cognitive categories” (Perry-Smith & Mannucci, 2017, p. 56). In the idea elaboration stage, individuals have to systematically evaluate their idea. To be successful at this task, they need emotional support in order to persevere and not give up on their idea as well as feedback and suggestions for improvement. In the idea championing stage, individuals would move on to actively promoting their idea in hope of securing enough support for its implementation. To this end, individuals need influence and legitimacy to persuade the key stakeholders and obtain their approval for idea implementation. In the last stage of idea implementation, the initial idea will turn into a concrete outcome and individuals will more likely succeed at this when there is a shared vision and understanding of their idea.

The idea journey model argues that individuals will move from one stage to another when the characteristics of their networks fit their specific needs at each stage. For instance, this model suggests that weak ties enhance idea generation, because receiving different information from weak ties leads to individuals spending more time on considering different options. In contrast, idea elaboration is enhanced by a limited number of emotionally charged strong ties,

because such ties would engender stronger emotional support and motivation to share ideas (but too dense networks may stifle novelty and promote conformity). Thus, this model suggests that specific network characteristics that are favourable at one stage might be harmful at other stages (Perry-Smith & Mannucci, 2017).

Based on the above synthesis, the model of idea journey and social network drivers can explain how tensions and paradoxes in individual creativity and innovation can be managed by suggesting that individuals have to adapt their understanding and interpretation of what is needed at different stages so as to complete idea journey successfully.

Theory of Paradox

Advanced within a broader management studies and strategy literature, the theory of paradox (Smith & Lewis, 2011) has proven to be a very useful theoretical lens from which to explore different psychological mechanisms that can explain tensions and competing demands experienced by employees, their supervisors, teams, and organizations as a whole in their quest to be innovative (Waldman et al., 2019). In their dynamic equilibrium model, Smith and Lewis (2011, p. 387) define a paradox as “contradictory yet interrelated elements (dualities) that exist simultaneously and persist over time.” The key underlying premise of this model is that dualities or conflicting forces persist over time and there is a constant, cyclical response to these conflicting forces. Unlike in trade-offs where we do something or have something at the expense of something else (i.e., “either-or”), the language of paradoxes is about having or achieving “both”. According to the dynamic equilibrium model, we can successfully manage paradoxes by means of acceptance and resolution strategies. Whereas the acceptance strategy refers to the awareness of tensions and dualities rather than a defensive response, the resolution strategy refers to solving paradoxical tensions either by means of splitting between tensions and choosing one to focus on at the time, or by seeking synergies that help integrate competing tensions (Smith & Lewis, 2011). Acceptance strategies have been suggested as a prerequisite for resolution strategies, because they enable different actors in the organization to feel comfortable with tensions.

In terms of specific concepts that can help us develop strategies to manage tensions in creativity and innovation at the individual employee and team levels, “paradoxical frames” (Miron-Spektor et al., 2011), “paradox mindset” (Miron-Spektor et al., 2018), and “paradoxical leadership” (Zhang et al., 2015) have received an increasing research attention. Miron-Spektor et al. (2011, p. 229) have defined paradoxical frames as “mental templates individuals use to embrace seemingly contradictory statements or dimensions of a task or situation”. Using a set of experimental studies, they showed that individuals who were able to embrace a paradoxical frame showed greater creativity than those who were not. The idea of paradoxical frames suggests that when faced with competing demands and tensions, adopting paradoxical frames helps individuals shift from competitive to complementary thinking, in turn enabling them to seek solutions for managing competing demands.

More recently, Miron-Spektor et al. (2018) operationalized paradoxical frames as paradox mindset: “a tendency to value, accept, and feel comfortable with tensions” (p. 34). They found that individuals with high paradox mindset innovated more and performed better when they perceived higher compared to lower levels of tension between limited time and finances. In contrast, innovation and performance of those with low paradox mindset were negatively affected by the experience of such tension. This line of research suggests that paradox mindset might indeed be an important individual-level factor that can help us resolve inherent tensions and competing demands in creativity and innovation.

Drawing from the theory of paradox and eastern literature and philosophy more broadly, paradoxical leadership has been introduced as a factor that can help employees, teams, and organizations manage inherent tensions and competing demands (Zhang et al., 2015). Defined as “leadership behaviours that are seemingly competing, yet interrelated, to meet competing workplace demands simultaneously and over time” (Zhang et al., 2015, p. 539), paradoxical leadership captures five behavioural categories, such as treating subordinates uniformly while allowing individualization, combining self-centeredness with other-centeredness, maintaining decision control while allowing autonomy, enforcing work requirements while allowing flexibility, and maintaining both distance and closeness.

The key premise of this leadership style rests on the assumption that leaders who are able to engage in the above five sets of behaviours are better equipped to manage all sorts of tensions and competing demands in teams and organizations. Recent research has identified different boundary conditions of the relationship between paradoxical leadership and creativity and innovation. Shao et al. (2019) observed that paradoxical leadership was positively related to creativity only when employees embraced integrative complex thinking and when they faced high workload pressure. Zhang et al. (2022) showed that paradoxical leadership behaviours were more positively associated with creativity through subjective ambivalence when individuals engaged in a low holistic thinking style.

The paradox lens undoubtedly has great potential to enrich the conceptual underpinning and empirical operationalization of different type of tensions and competing demands in creativity and innovation. This approach also seems useful to expand the exploration of these tensions across multiple levels of analysis to reveal more complex cross-level effects and interactions between individual, team, and organizational level tensions.

Ambidexterity Theory

The ambidexterity theory also has its roots in management studies (Tushman & O'Reilly III, 1996) and aims to address the organizational tension of achieving incremental and radical change. The key tenant of this framework suggests that organizations can manage this tension by being ambidextrous – being able to simultaneously explore (e.g., come up with new products, develop new competencies) and exploit (e.g., efficiently produce and sell products, improve existing competencies) – which helps organizations become more adaptable over time. Exploration and exploitation are in tension, because each requires a different set of structures, competencies, incentives, and cultural values, and senior management has to find a way of managing the tensions between both and not trading one for the other. This theory has propelled a large body of research around antecedents and consequences of ambidexterity and how ambidexterity can be achieved (O'Reilly III & Tushman, 2008, 2013).

In work and organizational psychology, the ambidexterity theory has been championed by Bledow et al. (2009) to explicate how tensions and conflicting demands can be managed across different levels in organizations for these to successfully innovate. They define ambidexterity as “the ability of a complex and adaptive system to manage and meet conflicting demands by engaging in fundamentally different activities” (Bledow et al., 2009, p. 320). Ambidexterity, and ultimately innovation, can be achieved by integration and separation of different activities that are required for exploration and exploitation across multiple levels. For instance, at the individual level, organizations can achieve separation of activities by rewarding individuals (as opposed to teams as a whole) for creativity and innovation. At the team level, separation can be achieved by targeted selection to increase team diversity. At the organizational level, separation can be achieved by time-based separation between

exploration and exploitation or by means of having specialized units, each focusing on a different type of activity.

Regarding integration of different activities, [Bledow et al. \(2009\)](#) suggest that this can be achieved by means of active management and self-regulation, and both will be required at different points in time. As an example, at the individual level, integration by active management can result from empowering all employees to engage in exploratory activities at least to some degree, whereas integration by means of self-regulation may refer to developing idiosyncratic strategies to cope with conflicting demands. At the team level, integration by active management can be achieved by having transformational team leaders who can provide a common vision, but teams can also achieve integration by means of self-regulatory processes, such as developing team reflexivity. At the organizational level, integration by active management can be achieved by having senior leaders who are able to embrace competing values and practices, whereas the emergence of innovation champions would be an example of integration by means of self-regulatory processes.

We see great promise in applying the ambidexterity theory to explicate tensions and competing demands in creativity and innovation at the individual and team levels of analysis in work and organizational psychology. Some studies that adopted this approach have advanced our understanding of what leadership behaviours are conducive of both exploration and exploitation ([Rosing et al., 2011](#)). Specifically, the ambidexterity theory of leadership for innovation recognizes that individuals and teams should engage in both exploration and exploitation, and be able to easily switch between both in order to achieve innovation. Exploration and exploitation are relevant and necessary for both creativity or idea generation and innovation or idea implementation, although to varying degrees. Whilst the exploration type of activities might be more closely related with the creativity and exploitation type of activities with innovation, idea generation might also benefit from exploiting existing knowledge and task-focused cognitive effort ([Nijstad et al., 2010](#)) and idea implementation might require thinking outside of the box, for instance how to overcome the initial resistance to radically novel ideas. Another tenant of this theory is that creativity and innovation are complex and non-linear. Although creativity and innovation are commonly viewed as a two-stage process of idea generation and idea implementation, these two processes are not linear and there are a number of iterations between both stages until we reach a satisfactory outcome. Therefore, exploration and exploitation will be required throughout the innovation process, but achieving both and switching between them is a challenging task.

One way to help individuals and teams with exploration and exploitation is to foster ambidextrous leadership ([Rosing et al., 2011](#)). Ambidextrous leaders are those who can engage in two complementary types of behaviours, such as opening behaviours (i.e. “leader behaviours that increase variance in follower behaviours by encouraging them to do things differently and to experiment, giving followers’ room for independent thinking and acting, and supporting followers’ attempts to challenge the status quo”) and closing behaviours (i.e., “leader behaviours that reduce variance in follower behaviours by taking corrective actions, setting specific guidelines, and monitoring goal achievement”; [Rosing et al., 2011](#); [Zacher & Rosing, 2015](#), p. 55). They should also be able to flexibly switch between both types of behaviours, depending on what behaviours are necessary in a particular situation in a particular point in time. Opening behaviours will help individuals and teams with exploration, because their leaders will encourage them to experiment and think about their problems from different angles. Closing behaviours will enable individuals and teams exploit better, because their leaders will engage in monitoring and establishing routines.

Although the concept of ambidextrous leadership and its opening and closing leader behaviours seems very promising in

helping us reconcile certain tensions in creativity and innovation, some research has already noted that ambidextrous leadership can both improve and undermine individual innovation, the latter via increased experience of stress ([Wang et al., 2020](#)). Future research should explore other underlying mechanisms that can explain such paradoxical effects of ambidextrous leadership on creativity and innovation.

Summary

We reviewed five frameworks, which offer different perspectives on the paradoxical nature of innovation and creativity. The dynamic componential theory and the idea journey and social network drivers model view creativity and innovation in terms of stages during which individuals have to engage in different activities that might be in tension. In contrast, the theory of paradox and ambidexterity theory aim to explain sources of tensions in creativity and innovation from the individual, team, and organizational perspectives. Further, the dual-pathway and dynamic componential models have predominantly focused on theorizing around the contradictory effects of individual cognition, motivation, and affect across different stages of creativity and innovation, whereas the idea journey model talks about different needs that the individuals have during different stages of creativity and innovation and how the characteristics of their networks shape their creative journey. Although theories of paradox and ambidexterity address creativity and innovation from a more macro level, they have shown promising results in work and organizational psychology, especially in relation to paradox mindset and paradoxical and ambidextrous leadership. In other words, rather than explicating what mechanisms can explain tensions in creativity and innovation, these theories have proposed specific concepts that can explain how inherent tensions in creativity and innovation can be managed and addressed.

Although some models conceptualize creativity and innovation as a multi-stage process, broadly speaking all frameworks consider creativity and innovation as a two-stage process of novel and useful idea generation and idea implementation. We adopt this definition in our review, but we consider the nature of this two-stage process to be non-linear with multiple feedback loops ([Amabile & Pratt, 2016](#); [Rosing et al., 2011](#)). Recognizing this non-linear nature of creativity and innovation might indeed be the first step towards a better understanding of inherent tensions and competing demands in individual and team creativity and innovation. Next, we turn our attention to discussing these tensions.

Tensions and Paradoxes in Individual Creativity and Innovation

In line with our definition, individual creativity and innovation refer to employees engaging in the generation of novel and useful ideas and their implementation ([Anderson et al., 2014](#)). This definition implies several inherent tensions. First, the novelty or originality of an idea will often be negatively correlated with its perceived usefulness ([Berg, 2016](#); [Harvey & Berry, in press](#); [Rietzschel et al., 2010](#)). The novelty and usefulness tension also translates into the tension that employees in organizations experience between the demand for novelty and, at the same time, efficiency and standardized work ([Shalley & Gilson, 2017](#)). Second, the generation of novel ideas as well as their implementation draw on fundamentally different individual behavioral repertoires and their successfulness depends on different individual characteristics ([Amabile & Pratt, 2016](#); [Bledow et al., 2009](#); [Perry-Smith & Mannucci, 2017](#)). Idea novelty will also create additional tension with implementation, because the more novel the idea, the less likely to be selected and implemented ([Baer, 2012](#); [Lu et al., 2019](#); [Mueller et al., 2018](#); [Mueller et al., 2014](#)).

Third, tensions exist even within one specific activity in the creativity and innovation process. For instance, within the idea generation stage, an individual is constantly internally selecting ideas, often before even verbalizing them (Nijstad et al., 2003). Similarly, in the idea implementation stage, individuals also need to engage in idea generation to flexibly deal with unanticipated challenges (Rahman & Barley, 2017). As a result, it is not surprising that there is not one cognitive mode, affective state, or contextual factor that consistently predicts individual creativity and innovation.

In this section, we will start by providing an illustrative review of how these inherent paradoxical demands play out when individuals engage in creativity and innovation. We will structure this overview based on the sources of tension outlined above and propose mechanisms that individuals may use to manage these tensions. After all, as creativity and innovation are a great source of change in organization and society, it is clear that some individuals are able to successfully navigate these challenging tensions (Shavinina, 2013). While it may be impossible to avoid the paradoxical demands associated with creativity and innovation, drawing from the concept of “creative and innovative metacognition”, we argue that it may at least be possible to deal with them.

Overview of Tensions in Individual Creativity and Innovation

Tension between Novelty and Usefulness

Novelty makes creativity and innovation valuable to individuals, teams, organizations, and wider society. The newness of an idea makes it stand out from the status quo and makes it effective at solving problems that were previously unsurmountable. Creative ideas, especially when they are being developed into an innovation, must also demonstrate their usefulness. In different ways, these two facets of creativity and innovation are a first source of tension. First, novelty and usefulness are in tension, because novelty makes a creative idea harder to get accepted by other relevant stakeholders, such as leaders, colleagues, and customers. There is ample evidence that organizational decision makers exclaim a preference for creative ideas, but at the same time show a clear bias against creativity when it comes to selecting these ideas for implementation (Mueller et al., 2012). Even individuals themselves show a tendency to disregard their own creative ideas in favor of more conventional ones (e.g., Rietzschel et al., 2010).

Second, research suggests that novelty and usefulness are the result of different cognitive processes. In a series of experiments, Berg (2014) showed that an early focus on either novelty or usefulness constrains the further creativity process to focus on this early content. To overcome this trade-off, an ideation process should start from a ‘primal mark’ that contained both new and familiar content (Berg, 2014). In an experiment, Miron-Spektor and Beenen (2015) found that cognitive flexibility predicted novelty, while cognitive closure predicted usefulness (mediating the effect of a learning vs. performance achievement goals, respectively). Grant and Berry (2011) also showed that intrinsic motivation, presumably as a precursor to cognitive flexibility, was associated with increased idea novelty, but the combination of intrinsic with prosocial motivation was associated with highest creativity (i.e., novelty and usefulness). These researchers showed that perspective taking (e.g., thinking about a client who would use a novel product or service) helped increase the usefulness of ideas. Overall, this research suggests that novelty and usefulness are associated with different cognitive processes. While cognitive flexibility is associated with novelty, usefulness seems to be more related to pursuing closure (although the research here is less consistent).

Tension between Generation and Implementation of Ideas

Another important source of potential tensions pertains to different stages of the creative and innovative process. As Zhou and Hoever (2014) argue in their review, individual (actor) variables can interact with context variables, and regardless of each one's main effects (positive, negative, neutral) their joint effect might change. One such contextual variable is whether an individual engages in idea generation or implementation. While stages of a creative and innovation process are in themselves neutral, recent research has made it clear that they interact with actor variables and that actor variables can have positive or negative effects depending on the stage in the creativity or innovation process. In line with our definition of creativity, we differentiate between early-stage cluster of activities focusing on ‘idea generation’, including generation and early selection and elaboration of ideas, and a late-stage cluster of activities focusing on ‘idea implementation’, focusing on idea championing and implementation. The activities involved in these stages are very different and suggest that individuals have to fulfil diverse needs to successfully complete each stage.

The early stages are characterised by creators' need for cognitive flexibility, the availability of diverse input, as well as the motivation to pursue creative goals. Within the creator (or possibly a team of creators), cognitive and personality characteristics as well as information networks need to be attuned to generate novel and useful ideas. However, once an idea is ready to go into the implementation stage, social and organizational needs become more apparent. Not only are implementation processes by their very nature more social and requiring more diverse sources of expertise (e.g., Garud et al., 2013), the creator(s) also take additional risks once an idea becomes visible to the broader organization. Research has shown that individuals in organizations are aware of how not only their direct managers are supportive of creative change, but also those in higher management's positions (Detert & Treviño, 2010). Once the idea leaves the relative safety of the creators' direct team and supervisor, broader performance and image risks may come into play (Yuan & Woodman, 2010).

As a result, several ‘stage-based’ theories argue that idea generation and implementation benefit from different kind of personal or contextual characteristics and a growing body of empirical evidence provides support for the conflicting needs of different stages. When it comes to personality traits, several studies have found that the optimal personality profile is different for idea generation compared to the idea implementation stage. Personality traits, such as openness to experience, extraversion, positive affectivity, and trait approach motivation (Baas et al., 2013; Zare & Flinchbaugh, 2019) that are linked to cognitive flexibility, are more strongly associated with idea generation. In contrast, idea implementation will likely benefit from traits that lead to cognitive persistence that is needed to overcome the challenges and frustrations associated with implementing novel ideas. Although the research that explicitly examines traits associated with idea implementation is very limited, Hunter and Cushenbery (2015) showed, in two lab experiments, that whilst disagreeableness was not related to idea generation, it was beneficial for getting generated ideas accepted and utilized by a group. In a recent meta-analysis, Puryear et al. (2017) found that conscientiousness was unrelated or negatively related to most measures of creative ideation, but was positively related to production of ideas.

Concerning social resources, as previously outlined, Perry-Smith and Mannucci (2017) propose that there are inherent tensions between the social network needs in different stages of the ‘journey’. Building on this idea, in a recent series of lab and field experiments, they found that activating weak ties was beneficial for idea generation, whereas strong ties became more beneficial during idea elaboration (Mannucci & Perry-Smith, in press). Madrid and Patterson's (2016) results suggest that perceptions of organizational fairness are associated with higher idea implementation, but are not related to idea

generation. While the focus of the paper was not on differentiating between effects on idea generation and implementation, these authors propose that fairness provides the necessary support and rewards for high performance that is needed for implementation. Baer (2012) suggested that implementation of ideas, as opposed to its generation, requires a network and political skills to overcome the political trappings associated with turning radical creative ideas into innovations. In a field study, he found not only that, on average, the more radical an idea, the less likely to get implemented, but also that employees with a more developed network of buy-in ties were better able to get radical ideas implemented if they combined this network with strong political networking skills.

While most differences between the effects of factors on different stages have to do with varying needs in the different stages, some factors may have different effects on the different stages regardless of specific needs. For example, expert domain knowledge arguably aids both the generation of ideas and their implementation (Amabile & Pratt, 2016; West, 2002). However, research has shown that high levels of expert knowledge can have detrimental effects on implementation, particularly on the effective selection of creative ideas (Boudreau et al., 2016; Lane, 2022). Boudreau et al. (2016) analysed grant proposals and their evaluations at a research university and found that evaluators who were closer to the area of research of a proposal tended to give lower scores. Recently, Lane et al. (2022) found that evaluators are more likely to focus on feasibility issues when they are domain experts, suggesting that domain expertise allows them not only to see potential, but also gives them insight into all the potential pitfalls associated with a novel idea. Hence, although domain expertise is supposedly important in both generation and implementation stages, there are clear cases of too much expertise when it comes to implementation.

Tensions within Generation and Implementation of Ideas

Tensions do not only result from the conflicting needs across different stages of creative and innovative process, but we also observe seemingly conflicting and paradoxical demands placed on individuals within one particular stage of creativity and innovation. For instance, several models and theories have conceptualized creative and innovative processes as different modes or paths that can, either jointly or separately, lead to creative and innovative outcomes. For example, the exploration – exploitation framework that we have discussed above (Bledow et al., 2009) – suggests two complementary modes that are, together, associated with successful innovation outcomes, and the two modes are not (necessarily) sequential. Another example is the dual pathway model (Baas et al., 2013; Nijstad et al., 2010), which predicts that both cognitive flexibility or persistence can lead to creativity, and creative performance is highest when both paths are pursued simultaneously. As work that is involved in creativity and innovation is usually ill-defined and uncertain, it demands cognitive flexibility and persistence throughout the idea generation and implementation stages (Ivcevic & Nusbaum, 2017). That is, it requires constant cognitive flexibility to make revisions and adjustments when faced with new insights of information, but the inevitable challenges and obstacles that creative ideas bring with them will require cognitive persistence throughout the process as well.

We therefore propose that it is not always helpful to understand and deal with tensions in creativity and innovation by splitting the idea generation and idea implementation process into increasingly smaller sub-activities. Rather, instead of trying to make sense of the complexity employing an ‘either/or’ perspective, we propose that one needs to take a ‘both/and’ mindset, stemming from the fact that creative and innovative processes always require a balancing act of flexible, diverging exploration with focussed, converging selection and implementation efforts.

Several recent empirical investigations have highlighted such fundamental tensions within creative and innovative activities. For instance, an ethnographic analysis of architecture project teams found that in every stage of a building design (conceptual stage, development, construction documentation) new problems would surface that often required the designers to generate additional ideas to redesign their initial design (Rahman & Barley, 2017). Successful architects and designers were those who were able to remain cognitively flexible enough during the later implementation phases to be able to redesign their initial ideas, solving a particular challenge while maintaining the original vision. Similarly, researchers have found that adopting both rational and intuitive thinking styles can increase creative idea generation (Dane et al., 2011) and that intuitive processing can outperform systematic processing when it comes to selecting the best (i.e., most novel and useful) ideas (Pétermári et al., 2016; Zhu et al., 2017).

Another tension that can also reside within a particular stage is the tension between structure and freedom – although there is ample evidence to suggest that freedom and structure can differentially benefit the idea generation and implementation stages (Evanschitzky et al., 2012). Research has generally shown that increased freedom and autonomy are associated with higher creativity or idea generation (Liu et al., 2016), though there are several examples of constraints that can also enhance creativity. For instance, several experimental studies have shown that giving participants a template-like structure to follow during ideation increased the originality and overall creativity of ideas generated in a product design task, compared to participants working under an unconstrained free-thinking (‘blue sky’) paradigm (Goldenberg et al., 1999a, 1999b; Sagiv et al., 2010). Other recent work has shown that imposing social norm constraints (e.g., political correctness norms) can improve idea generation (Goncalo et al., 2015) (see Acar et al., 2019 for a recent review on the often conflicting role that constraints play in creativity and innovation.)

When it comes to affect and mood, the traditional view is that positive and high activated moods are conducive to both idea generation and implementation (Baas et al., 2008; Madrid et al., 2014). However, recent investigations following individual innovators over time, working on one specific task, have shown that the role of mood and affect is more complicated. That is, several studies have shown that affective states tend to shift during creative work and suggest that these shifts are an inevitable and possibly necessary aspect of a creative idea journey. Combining longitudinal field data and experimental evidence, Bledow et al. (2013) showed that individual creative idea generation was highest when a creator experienced an ‘affective shift’: an increase in positive affect had a positive effect on creativity when it was combined with a decrease in negative affect. Similarly, a recent one-year qualitative study among nascent entrepreneurs (Toivonen et al., in press) found that during the early stages of business idea generation and elaboration, individuals often experience a ‘creative jolt’ episode, consisting of a big drop in positive affect combined with an increase in negative affect (fear, frustration, etc.), to be followed again with a shift after a successful resolution. The existential crisis that lies in between the two shifts pushes individuals to engage in difficult additional exploration that, eventually, helps create a better revised idea. Thus, as affect does not seem to linearly predict idea generation, we need a dynamic view of positive and negative affect, and the associated cognitive strategies.

Conclusions: Managing Tensions in Individual Creativity and Innovation

The reviewed literature above shows that tensions are not limited to how individuals manage specific activities in the idea generation and implementation stages, but they also occur within each specific

stage. Different and conflicting cognitive processes, affective states, and situational factors play important roles in both driving and inhibiting idea generation and implementation. Creativity and innovation are not driven by freedom “or” constraints, by positive “or” negative affect, by intuitive “or” systematic thinking, but by all of the above. All these predictors facilitate either cognitive flexibility or persistence, both of which are needed throughout the idea generation and implementation stages, both between and within each stage. This makes it particularly challenging to manage creativity and innovation, as it means that we cannot make consistent recommendations about how these predictors will relate to the creative and innovative behaviours at work. Hence, these conflicting demands and tensions pose important challenges to individuals and those trying to support them with their idea generation and implementation efforts (e.g., a supervisor).

However, while the events that precede successful idea generation and implementation may seem complex and perhaps even chaotic and difficult to manage, the fact that some individuals are consistently able to produce creative and innovative outcomes (e.g., [Shavinina, 2013](#)) shows that it is possible to overcome these challenges. We argue that dealing with the inherent tensions of creativity and innovation requires a set of cognitive traits and skills that we term “creative and innovative metacognitions.”

Creative and innovative metacognitions refer to the ability of individuals to monitor, evaluate, and manage their creative and innovative functioning. This concept has been described in earlier work, specifically in relation to creativity ([Puente-Díaz et al., 2021](#)); however we expand on it to emphasize that individual behaviours required for innovation are equally plagued by tensions and conflicting demands. Many cognitive processes play a role in understanding, monitoring, and managing the creative and innovative process; for instance, intelligence is likely an important factor as increased cognitive ability is linked to more accurately assessing one's own creativity ([Karwowski et al., 2020](#)). However, here we specifically limit ourselves to metacognitive traits and skills that relate to dealing with tensions in individual creativity and innovation. Specifically, we highlight paradox mindset, emotion regulation, and cognitive switching.¹

First, “paradox mindset”, as previously mentioned, refers to a mental framework that helps individuals to be comfortable with, and even embrace, inherent tensions that are associated with creativity and innovation ([Miron-Spektor, 2018](#); [Miron-Spektor et al., 2011](#)). As such, it can be seen as a meta-skill to understand that one's own (or team members') characteristics have conflicting and varying effects at different points during a creative and innovative process. Feeling comfortable with tensions can also help to avoid prematurely engaging in convergence, which could hurt the explorative side of creativity and innovation.

A second meta-cognitive ability to deal with tensions is “emotion regulation”. Given the affective rollercoaster that creativity and innovation are ([Bledow et al., 2013](#); [Toivonen et al., 2022](#)), a key metacognitive skill is to manage one's own (and others' – e.g., in a capacity of a supervisor) emotions. Emotion regulation refers to monitoring, as well as influencing and changing one's own emotions in order to reach a goal ([Gross & John, 2003](#)). Scarce prior research has connected emotion regulation to creativity ([Ivcevic & Brackett, 2015](#)), but taking into account the broader innovation process, it is clear that effectively managing one's own emotions is crucial to persisting throughout both stages of creativity and innovation ([Rahman & Barley, 2017](#); [Toivonen et al., in press](#)).

Third, we suggest that the ability to flexibly “switch cognitive modes” is key to dealing with tensions. Many of the highlighted tensions above, both within and between stages of the idea generation and implementation, suggest that it is vital to be able to switch between different cognitive modes quickly and often. While switching mindsets over time may come natural and is likely unproblematic (e.g., between stages), making rapid switches within

a short timeframe (e.g., within one stage) may be very cognitively taxing ([Hamilton et al., 2011](#)). Hence, having the skill to switch between ‘cognitive gears’ ([Louis & Sutton, 1991](#)) more easily should greatly help to manage the tensions in creativity and innovation.

Tension and Paradox in Team Creativity and Innovation

Although many people associate creativity with the efforts of highly creative individuals, such as Vincent Van Gogh or Marie Curie, idea generation and implementation are often achieved in a team context. Indeed, scientists develop research ideas together ([Dunbar, 1995](#)), top managers collaborate to be innovative ([Nijstad et al., 2014](#); [West & Anderson, 1996](#)), artists sometimes operate in “collaborative circles” ([Farrell, 2001](#)), and teams of designers develop new products together ([Sutton & Hargadon, 1996](#)). Team creativity and innovation may be defined as the generation of novel and useful ideas and their implementation by several interacting people in a team context, while these ideas cannot be readily attributed to a single individual ([Hülsheger et al., 2009](#); [Nijstad, 2015](#)).

There are several reasons why teams are used for creative and innovative pursuits. First, some tasks are simply too big to take on by a single individual and therefore require the collaborative efforts of several people. For example, movie director Peter Jackson could never have completed the Lord of the Rings trilogy alone, and Robert Oppenheimer would not have completed the Manhattan Project (the development of the atomic bomb) without the involvement of many creative scientists. Second, and related, when using teams to be creative and innovative, it becomes possible to draw on the diverse expertise, unique insights, and different viewpoints of the different team members. For example, designing a new car involves different areas of expertise, and the same will be true for most R&D projects, especially when they involve complex problems. As another example, a number of famous music bands, such as The Beatles, Queen, or the Rolling Stones, have clearly benefited from having “several” creative members (Paul McCartney “and” John Lennon; Freddy Mercury “and” Brian May; Mick Jagger “and” Keith Richards). Third, teams form a meso-level structure in between the individual and organizational levels, and may represent the prime location where creative ideas are turned into innovations (e.g., [Hülsheger et al., 2009](#)). That is, although creative ideas can be generated by individuals, implementing them as innovations requires support and resources, and this may be effectively organized in teams. Also, ideas that have been generated by a team that works together may receive support from all team members, because they experience shared idea ownership; in turn, this may imply that the idea is more likely to be implemented.

The Basic Paradox in Team Creativity: Differentiation-Integration

An important reason to leave creative and innovative tasks to teams is that different team members can bring different expertise, insights, information, and viewpoints to the table. Indeed, there would be little point in working together as a team if everyone had the same ideas and the input of different members would be redundant. Especially when it comes to creative and innovative tasks, what is needed is unique and non-redundant input; we refer to the provision of unique input as “differentiation” (see also [Ainsworth et al., 2016](#)). Differentiation may result from various factors, such as team (cognitive) diversity, independent thinking, the inflow of newcomers, and from minority dissent and task conflict (see below and e.g., [Bechtoldt et al., 2012](#); [Choi & Thompson, 2005](#); [De Dreu, 2006](#); [De Dreu & West, 2001](#); [Wu et al., 2021](#)).

However, as we argued earlier, the ambidexterity literature (e.g., [Bledow et al., 2009](#)) suggests that to eventually create some output

as a team, this does not require only differentiation (or separation), but also integration (see also [Harvey, 2013](#); [Nijstad & De Dreu, 2016](#)). Differentiation would provide a diverse range of input, but this is not sufficient to eventually innovate or create a (finished) creative product. Rather, teams need to converge on some final solution or final new product or service, and this requires convergence and agreement, rather than divergence and differentiation. The need to converge implies conformity, because without agreement a team cannot move forward. The basic paradox of team creativity is therefore that both differentiation and integration are needed for teams to be successful at creativity and innovation. The expression of uniqueness and independence stimulates divergence (or separation), but this may lead to conflict rather than to agreement and integration. At the same time, the need for agreement and convergence creates a pressure to conform and to suppress independence and uniqueness.

The preceding suggests that, to be creative and innovative, team members must contribute variety (differentiation) and teams must also process the contributions of their members to arrive at a collective and creative end product (integration). According to the Motivated Information Processing in Groups Model ([De Dreu et al., 2011](#); [De Dreu et al., 2008](#); [Nijstad & De Dreu, 2012](#)), such collective information processing (to achieve effective integration) requires two types of motivation: the motivation to thoroughly process member contributions (epistemic motivation) and the motivation to prioritize team outcomes over individual outcomes (pro-social motivation). With low epistemic motivation, contributions will be taken at face value and no (deep-level) integration will take place; with low pro-social motivation individuals lack the motivation to produce collective output (e.g., they may want to push their own ideas). High team creativity and innovation are therefore expected when (1) members contribute unique insights and ideas (i.e., high differentiation), (2) teams are motivated to thoroughly process this input (i.e., high epistemic motivation) and (3) teams are motivated to do well collectively (i.e., high pro-social motivation). Several lines of research support these ideas, which we will now discuss.

Evidence for the Differentiation-Integration Paradox

Team Diversity

One major source of variety in perspectives and ideas is diversity in member attributes, and in particular task-related diversity has been related to team creativity and innovation. For example, [Bell et al. \(2011\)](#) found in their meta-analysis that demographic diversity (i.e., diversity in gender, race, and age) was unrelated to creativity, but that functional and educational background diversity were positively related to team creativity and innovation. However, these relations were fairly weak ($\rho \approx .20$), and a more recent meta-analysis found even weaker relations, suggesting that having diverse teams alone may not be enough to ensure high levels of creativity ([Byron et al., 2022](#)).

Consistent with our perspective, [Harvey \(2013\)](#) suggested that one reason why diversity does not have stronger positive effects is that deep level diversity (i.e., diversity in underlying perspectives) may be beneficial for the divergent process of idea generation, but may actually harm the convergent process of combining, building on, and integrating ideas. She tested this idea in two laboratory experiments, in which diversity was manipulated by giving different team members a different perspective on the team task (versus not). Harvey found that this manipulation generally increased the uniqueness of generated ideas, but actually undermined the team's ability to elaborate ideas. As a result, diverse teams were not more creative than teams with more homogeneous perspectives. In other words, diversity led to increased differentiation, but also to reduced integration.

To overcome the problems of diverse teams in terms of converging and integrating their ideas, effective integration mechanisms should be in place that encourage diverse teams to actively process and integrate each other's ideas. This suggests that the relation between team diversity and team creativity will be dependent on the degree to which this is the case, and, indeed, studies have examined the question "when" (e.g., under which conditions) diverse teams are more creative than homogeneous teams. For example, [Shin and Zhou \(2007\)](#) found, in a sample of R&D teams, that educational background diversity was positively related to team creativity, but that this relation was stronger when team leaders were high on transformational leadership (see also [Wang et al., 2016](#)). In a laboratory experiment, [Hoever et al. \(2012\)](#) manipulated diversity in perspectives (through role assignment) and found that this increased team creativity only when team members were instructed to take each other's perspectives. This effect was mediated by information elaboration (i.e., collective information processing). [Fay et al. \(2006\)](#) examined healthcare teams and found that multidisciplinary teams were more innovative than mono-disciplinary teams, but only when the quality of team processes in these teams was high (e.g., when teams often reflected on their processes and when team climate was positive).

Together, these studies suggest that diversity alone is not sufficient, but that additional conditions need to be in place for diversity to be beneficial for team creativity. What seems to be needed are additional factors that stimulate collective information processing (see also [Van Knippenberg et al., 2004](#)). For example, transformational leaders are thought to motivate team members to work towards a common and inspiring vision that is in the interest of the collective. Teams that endorse such a vision will be motivated to actually use the diverse input of their members to achieve collective creativity and innovation and thereby move closer to their (collective) goal. Similarly, perspective taking and high quality team processes will ensure that the input from diverse members is actually heard, processed, and integrated in a collective product. Thus, although team diversity may stimulate differentiation, other factors are needed that make sure that diverse inputs are also integrated into the team's output.

Newcomers

While diversity refers to team composition, the literature on newcomers is about changes in team composition. Interestingly, in the original paper about the exploration-exploitation trade-off, [March \(1991\)](#) already proposed that employee turnover would be associated with the firm-level tendency to explore (versus exploit) and learn new competencies. Also in team-level research, newcomer entry is often associated in particular with creative and innovative outcomes (e.g., [Choi & Levine, 2004](#); [Rink et al., 2013](#)).

Newcomers are often associated with creativity and innovation, because newcomers represent "fresh blood" and can bring in new knowledge, insights, and ideas. At the same time, newcomer entry implies a change in team composition, and this change may require changes in the way the work is carried out. This forces "old" team members to reconsider their way of working, which may spark new ideas. Indeed, in two laboratory studies, [Choi and Thompson \(2005\)](#) found that "open groups" (i.e., groups in which one member was replaced by a newcomer) were more creative than "closed groups" (i.e., groups that stayed intact). This effect was both due to the newcomer and the "old" members: more creative newcomers had a stronger impact than less creative ones, but also the old members became more creative after newcomer entry.

[Choi and Thompson \(2005\)](#) found their effects in an idea generation task, and it seems that newcomers can improve especially divergent creativity. However, how about convergence? This question was

recently addressed in another experimental study (Wu et al., 2021). Wu et al. (2021) proposed that newcomers would mainly stimulate idea generation, but that team creativity usually does not stop there. Rather, ideas need to be combined and used in appropriate ways to create some final product. In their experiment, Wu et al. therefore asked teams of three to first generate ideas about a poster that should attract donations and volunteers for a charity. After the initial idea generation session, the teams had to actually put the poster together, which was evaluated for creativity. Half of the groups experienced membership change (between idea generation and the making of the poster) and the other half did not. Further, half of the teams were promised a collective reward for producing highly creative posters, whereas the other half were not. Wu et al. argued and found that newcomers would stimulate idea generation, but that this would only lead to more creative end products when teams were motivated to produce a high quality collective product (i.e., when the quality of their collective product was rewarded).

In sum, the literature on membership change suggests that newcomers may effectively simulate divergence. However, this literature equally suggests that newcomer ideas can be easily ignored and have no impact on team performance (see Rink et al., 2013, for an overview). Therefore, teams that include newcomers need to be explicitly motivated to process and include new ideas – both those generated by the newcomers and the “oldtimers” – to benefit from membership change (Wu et al., 2021; also Choi & Levine, 2004). In other words, “fresh blood” stimulates differentiation, but this only benefits the team when integration is also high.

Independent Thinking

To express unique points of view in a team requires individuals to be different and act differently from others. The tendency to be unique, to stand out, and to express one's own viewpoints has been associated with an independent as opposed to an interdependent self-construal (Markus & Kitayama, 1991). Rooted in the cultural dimension of individualism-collectivism, an independent self-construal implies that individuals see themselves as distinct from others and as possessing a unique pattern of traits that distinguish them from other people. An interdependent self-construal, in contrast, implies that the self is related to others and it emphasizes relatedness and context-dependence of the self (as opposed to uniqueness). The different self-construals are rooted in one's culture, but can also be activated by situational cues that indicate that a certain type of behavior is appropriate or called for (e.g., “standing out” vs. “fitting in”).

Goncalo and Staw (2006) have linked self-construal to team creativity. They proposed that people with an independent self-construal show less conformity than people with an interdependent self-construal. Because creativity is about expressing unique ideas rather than conforming to ideas of others, they predicted that teams with an independent self-construal would be more creative than those with an interdependent self-construal. Goncalo and Staw (2006) tested this prediction in an experiment, in which they manipulated self-construal by asking (American) participants to think about how they are different from others (vs. similar to others) and why it would be advantageous to “stand out” from others (vs. “blend in” with others). They also manipulated creativity norms, emphasizing creativity for half of the teams and practicality for the other half. Goncalo and Staw (2006) found that teams with an independent self-construal were more creative than those with an interdependent self-construal, but only when task instructions emphasized creativity rather than practicality of ideas. Based on this work the authors concluded that collectivistic cultures may stimulate collaboration, but that individualistic cultures would be better for creativity.

However, later research has nuanced this conclusion. Bechtoldt et al. (2012) argued that the cultural dimension of individualism-collectivism does not only entail differences in self-construal, but also differences in values. In particular, individualistic cultures tend to value individual outcomes over collective outcomes, whereas the reverse is true for collectivistic outcomes. These authors further argued that an independent self-construal may lead to the generation of many (original) ideas, but that collectivistic values are needed to ensure that team members attend to each other's ideas and build on them. In an experimental study, Bechtoldt et al. (2012) therefore proposed and found that the highest level of team creativity was observed in teams in which an independent self-construal was combined with collectivistic values. Similar results have been reported by Choi and colleagues (e.g., Choi et al., 2018; Choi & Yoon, 2018).

In sum, although an independent self-construal may be beneficial for the expression of unique ideas in a team context, the convergent process of building on the ideas of others requires the motivation to produce collective output. Paradoxically, individualistic teams perform best when they work in the interest of the collective.

Conflict and Dissent

One further factor that can shed light on differentiation-integration paradox is dissent and conflict. Dissent and conflict may be rooted in team diversity and independent thinking, and refer to behaviours (or team processes) rather than to team composition. Dissent is usually associated with (numerical) minorities that take a different position than the majority (cf. independent thinking, non-conformity), whereas conflict refers to tensions within a team as a consequence of real or perceived differences among team members (cf. diversity; see De Dreu & Weingart, 2003; De Dreu & West, 2001). With regard to team conflict, often a distinction is made between task and relationship conflict. Task conflict refers to (task-related) differences in opinions, preferences and the like, whereas relationship conflict refers to incompatibilities in personality, personal tastes, and so on (Jehn, 1994, 1995). Relationship conflict tends to be more personal and intense than task conflict, although task conflicts may easily become personal (e.g., De Dreu & Weingart, 2003).

While relationship conflict generally undermines collaboration and performance of teams, both (minority) dissent and task conflict have been suggested to have potentially positive effects, especially for more complex and creative/innovative tasks (Jehn, 1995). In line with this, both dissent and conflict prevent a (potentially premature) move to team consensus and may therefore stimulate teams to think more carefully about issues. Also, dissent and task conflict necessarily imply differentiation, because different members express different viewpoints and opinions, and this should be associated with increased divergence and creativity. Thus, dissent and conflict may benefit team creativity and innovation.

Overall, however, such a positive relation is not observed in meta-analyses, at least not for task conflict (see De Dreu & Weingart, 2003; De Wit et al., 2012; Hülsheger et al., 2009). There may be two reasons why task conflict does not have the expected positive effects on team creativity and innovation. First, task conflict may sometimes be too intense or it may spill over into relationship conflict, which in turn undermines teamwork and collaboration. Consistent with this viewpoint, De Dreu (2006) observed a curvilinear relation between task conflict and team innovation, such that innovation was highest with moderate amounts of task conflict. Similar findings have been reported by Farh et al. (2010), who additionally found that this curvilinear effect only occurred for the early stages of team projects, suggesting that a moderate amount of conflict is especially beneficial for divergence (but maybe not convergence in later stages).

Second, consistent with a tension perspective, the positive effects of dissent and conflict may only occur when adequate integration mechanisms are in place: dissent and conflict reflect or stimulate divergence, but other factors are needed to also effectively converge on creative and innovative solutions. Several findings are consistent with this. For example, in two samples [De Dreu and West \(2001\)](#) found that minority dissent could stimulate team innovation, but that this effect only occurred when team participation in decision making was high. Similarly, [Nijstad et al. \(2014\)](#), in a sample of top management teams, found that dissent stimulated team innovation only when team leaders were high on transformational leadership. Both high participation and transformational leadership may ensure that contributions of different factions are taken seriously and are integrated to achieve a collective solution, which may be why the effect of dissent depends on other factors.

Other studies have examined moderators of the relation between task conflict and team creativity/innovation. [Bradley et al. \(2012\)](#), [Fairchild and Hunter \(2014\)](#), and [Deng et al. \(2021\)](#) all examined the role of psychological safety, a team climate dimension that refers to a shared perception that the team is safer for interpersonal risk taking ([Edmondson, 1999](#)). Such a climate would not only ensure that different viewpoints are actually expressed (differentiation), but also that they can be seriously discussed in a non-threatening environment, which may improve integration. Indeed, different authors found that the relation between task conflict and team creativity and innovation was more positive in teams with higher levels of psychological safety.

Conclusion: Managing Tensions in Team Creativity and Innovation

This integrative review of illustrative evidence suggests that managing team creativity and innovation implies managing the tension between differentiation and integration. The challenge for managers would be to facilitate and sustain team member differentiation, while simultaneously ensure that differentiation does not go at the expense of integration (e.g., that it undermines collaboration). Vice versa, collaborative integration of member contributions must be ensured, without at the same time suppressing differentiation (e.g., the expression of dissent). We propose that this somewhat paradoxical task can be achieved mainly through good team design and leadership.

With regard to team design, we want to highlight two actionable factors: team composition and interdependence. First, a balanced team composition, as well as balanced changes in team composition, can be used to ensure sufficient differentiation. This can be accomplished by selecting members that are diverse with respect to task-related attributes, such as educational or professional background. Also including team members who are more independent in their thinking (e.g., non-conformists, or “creatives”) may be a good strategy, although a mix of creative and conformist members seems even better ([Miron-Spektor & Erez, 2017](#)). For sufficient differentiation, it can also be beneficial to have some membership change, although it is likely that stability in membership is also needed.

Team composition is mainly important for differentiation, but interdependence is mainly important for integration. Research suggests that there are two broad types of interdependence: task interdependence (i.e., “the degree to which taskwork is designed so that members depend upon one another for access to critical resources and create workflows that require coordinated action”) and outcome interdependence (i.e., “the degree to which the outcomes of taskwork are measured, rewarded, and communicated at the group level so as to emphasize collective outputs rather than individual contributions”; [Courtright et al., 2015](#), p. 1828). Task interdependence creates a “need” to cooperate closely together, and outcome interdependence

creates the “motivation” to cooperate. What is important when it comes to creativity and innovation is that these two types of interdependence are aligned rather than misaligned ([Van Der Veegt et al., 2000](#); [Van der Veegt & Janssen, 2003](#); [Wageman & Baker, 1997](#)). When both types of interdependence are either high or low, there is a match between the need and the motivation to cooperate. Under low task interdependence and high outcome interdependence, however, members depend on others over which they have no control, creating uncertainty. Under high task interdependence and low outcome interdependence, team members have a need to cooperate, but lack the motivation to do so. We propose that especially under high task and high outcome interdependence team integration activities will be high, and – provided a sufficient degree of differentiation – this will facilitate team creativity and innovation.

Finally, we would like to emphasize the role of the team leader. In the previous paragraphs, we have already seen that transformational leadership has been found to moderate the effects of team diversity ([Shin & Zhou, 2007](#)) and dissent ([Nijstad et al., 2014](#)). Furthermore, as outlined in the section on theoretical foundations, the ambidexterity literature suggests that leaders can manage the tension between differentiation and integration by showing both opening behaviors and closing behaviors ([Rosing et al., 2011](#); [Zacher & Rosing, 2015](#)). Consistent with this idea, [Zacher and Rosing \(2015\)](#) found that leader opening behaviors (e.g., giving room for own ideas) positively predicted team innovation, but only for leaders that were also high on closing behaviors (e.g., sticking to plans).

[Mainemelis et al. \(2015\)](#) have also emphasized the role of “creative leadership” and distinguish three different types of such leadership: facilitating (fostering the creativity of employees), directing (materializing a vision through other people’s work), and integrating (synthesizing one’s own creative work with the contributions of others). Applied to our framework, one may say that leaders can stimulate team creativity and innovation by simultaneously or over time facilitate differentiation (e.g., encourage and support dissent and independence), direct the team towards a common goal (e.g., communicating a vision, creating interdependencies), and thereby integrate the contributions of different members to achieve high collective outcomes.

Agenda for Future Research

Our discussion of different tensions in individual and team creativity and innovation opens up novel and fruitful avenues for future research. We particularly identified the need for: a) further multi-level theories that can explain complex interactions and dynamics between different tensions in creativity and innovation across multiple levels of analyses, b) conceptualizing and empirically addressing organizational level tensions in creativity and innovation from a work and organizational psychology perspective, and c) separating between different stages of creativity and innovation to enhance our understanding of inherent tensions in both phenomena and how to reconcile them.

The Need for Further Multi-level Conceptual Development

Our review shows that we lack rigorous and nuanced theoretical frameworks that can explain how to balance and reconcile tensions and competing demands in idea generation and implementation. To this end, we would like to encourage future research to develop conceptual models that propose diverse mechanisms underlying inherent tensions in creativity and innovation that go beyond cognitive processes and affective states. Such models could address complex and dynamic cross-level effects of individual and contextual predictors on team and individual creativity and could go even further to include the broader organizational level. For

instance, such models could explain in what ways top management can shape team and individual creativity by providing support and resources to simultaneously encourage both creativity and innovation and efficiency.

Addressing Organizational-level Tensions in Creativity and Innovation

Research in work and organizational psychology could also more explicitly address and conceptualize tensions at the organizational level, for instance in terms of competing cultural values or different organizational design choices that might explain why some organizations find it so hard to achieve successful innovation despite significant investment of resources. It could be that the top management signals how much it values innovation by means of investing in recruiting “creative” employees or designing innovative teams; however, when novel and useful ideas are presented to them, these are perceived as too risky and end up being rejected. Future research could empirically study such prepositions to shed light on organizational level tensions in terms of desire for innovation but at the same time the inability to cope with risk and uncertainty that are inherent to creativity and innovation.

Another tension at the organizational level that would be worth exploring, conceptually and empirically, is the potential conflict between unequivocal drive for bureaucracy and standardization to make organizational functioning predictable, particularly in larger organizations, and the cultural value for creativity and innovation. Future research could uncover how employees and teams manage to navigate through such paradoxical environment to successfully engage in idea generation and implementation for the benefit of different organizational stakeholders.

Separating between Different Stages of Creativity and Innovation

We also noticed that the large majority of creativity and innovation research has not separated between the stages of idea generation and implementation let alone between more fine-grained stages as proposed in process models of creativity and innovation (Reiter-Palmon & Illies, 2004). This is indeed a major omission in the current literature as our review shows that some individual traits and contextual factors can be beneficial for some stages or parts of the creative and innovative process, but harmful or irrelevant for others. A major avenue for future research lies in further conceptualization of the cognitive processes that distinguish those that are effective in balancing the competing demands from those that falter. We argued that creative and innovative metacognition (including paradox mindset, emotion regulation, and task switching ability) could be a way to make this distinction, and this could be tested in future research.

In addition, more work is needed to clarify the different sources of tensions and their underlying mechanisms between idea generation and implementation stages. While most tensions between the stages seem to be driven by the varying needs of each stage, we also noted that some factors, that ostensibly appear beneficial for both stages, may in fact have adverse effects on one stage or the other. We provided the example of domain expertise (e.g., Boudreau et al 2016), but other factors could be explored. For instance, the effects of iterative coordination and other ‘agile’ work processes may provide a way of working that could aid both idea generation and implementation. However, just as research has suggested that agile work is associated with higher effectiveness at the cost of novelty (Ghosh & Wu, 2021), it is possible that agile work steers idea generation towards development of more incremental ideas, which may ultimately facilitate the implementation of more radical ideas over time.

Conclusion

Creativity and innovation have undoubtedly improved the quality of our lives and have made our societies more prosperous and sustainable, which makes both phenomena highly valuable and universally sought after. However, this unquestionable positive outlook on creativity and innovation might conceal the inherent tensions and conflicting demands that individuals and teams experience when they engage in generation of novel and useful ideas and their implementation. They will face conflict, stress, competing demands, rejection, and failure, and it is about time that we explicitly acknowledge this less pleasant side of creativity and innovation and advance the field towards a better understanding of how the paradoxical nature of creativity and innovation can be managed, for instance through a focus on creative and innovative metacognition. We hope that we have made a step towards this direction.

Conflict of Interest

The authors of this article declare no conflict of interest.

Note

¹It should be noted that these metacognitive abilities assume that an actor has accurate knowledge about the different processes that they are navigating between, and about the needs associated with them. Hence, the effectiveness of the metacognitive skills outlined here will be limited by the extent of meta-knowledge about the creative and innovative process itself.

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