



#### ANNUAL REVIEWS **Further**

Click [here](#) to view this article's online features:

- Download figures as PPT slides
- Navigate linked references
- Download citations
- Explore related articles
- Search keywords

# Team Innovation

Daan van Knippenberg

Rotterdam School of Management, Erasmus University, 3000 DR  
Rotterdam, The Netherlands; email: [dvanknippenberg@rsm.nl](mailto:dvanknippenberg@rsm.nl)

Annu. Rev. Organ. Psychol. Organ. Behav. 2017.  
4:211–33

First published online as a Review in Advance on  
January 20, 2017

The *Annual Review of Organizational Psychology and  
Organizational Behavior* is online at  
[orgpsych.annualreviews.org](http://orgpsych.annualreviews.org)

<https://doi.org/10.1146/annurev-orgpsych-032516-113240>

Copyright © 2017 by Annual Reviews.  
All rights reserved

## Keywords

team, group, innovation, creativity, diversity, knowledge integration,  
information elaboration, team climate, team composition

## Abstract

Team innovation is of growing importance in research in organizational psychology and organizational behavior as well as organizational practice. I review the empirical literature in team innovation to draw integrative conclusions about the state of the science and to provide a research agenda to move the field forward. The review identifies two main perspectives in team innovation research, the knowledge integration perspective and the team climate perspective. Key conclusions focus on the need to integrate these perspectives to develop an integrative contingency model of the factors providing teams with diverse informational resources and the factors influencing the extent to which teams integrate these resources in a process of information exchange and integration. As part of these integrative efforts, construct consolidation efforts are important to reverse the tendency for proliferation of substantially overlapping moderators and mediators proposed. The review also identifies the contingencies of the relationship between idea development and idea implementation as the most important understudied issue in team innovation research.

## INTRODUCTION

Innovation is on the agenda of organizations more than ever before (Anderson et al. 2014). Working in rapidly changing environments with changing competition, changing customer needs, etc., organizations need to innovate for sustainable competitive advantage (March 1991, Leifer et al. 2000). For such innovations, organizations increasingly rely on teams (Ilgen et al. 2005), especially when innovation is the very reason the team exists such as in research and development (R&D) and new product development (Barczak et al. 2009a). Understanding what leads to team innovation thus is of clear importance to research and practice in organizational psychology and organizational behavior. However, team innovation has traditionally received little research attention (Kurtzberg & Amabile 2001, West 2002b), with research attention directed to either individual creativity at work (Zhou & Hoever 2014) or the organizational level of analysis (Leifer et al. 2000). More recently, however, this picture has started to change with growing attention to team innovation and team creativity (overlapping but not synonymous concepts), and the aim of this review is to take stock of the state of the science in empirical research on team innovation. In doing so, I seek to advance the state of the science through integration of insights from different studies as well as by providing a research agenda that is suggested by important unanswered questions emerging from this integrative review.

Before embarking on this review, it is important to clarify the key constructs of team innovation and team creativity as well as to give a sense of the literature the review aims to cover. Innovation is typically understood along the lines of West & Farr's (1990, p. 9) definition as "the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the relevant unit of adoption, designed to significantly benefit the individual, the group, organization or wider society." Team innovation can be seen in a more specific adaptation of this more general definition (i.e., innovation by the team, for the team, organization, or a broader group of stakeholders). This definition of innovation implies that the team need not develop the novelty itself—the key is introducing something that is new to the team or organization—but it could exist outside of the organization already; innovation could be the implementation of something novel without having developed the novelty itself (West & Farr 1990). However, in the practice of team innovation research, team innovation is by and large understood as including both the development and implementation of novelty.

In that sense, the going understanding of team innovation brings it closer to the understanding of creativity at work as the generation of novel and useful ideas, processes, products, or procedures (Amabile 1988, 1996). As a case in point, measures of team creativity and team innovation often overlap to such an extent that team creativity and team innovation research can be reviewed as two parts of the same body of evidence. That said, some innovation researchers take a narrow understanding of creativity as idea generation and emphasize that innovation also includes idea implementation as a critical element, distinguishing it from creativity (West 2002a), and some creativity research explicitly limits itself to idea generation. There thus is some potential for confusion with some researchers suggesting a distinction between creativity as only the development of ideas and innovation as both the development and implementation of ideas, whereas others treat creativity in a way that moves beyond idea development and overlaps much more with the notion of innovation.

Whereas it is hard to overstate the importance of the implementation part—innovation ultimately is about doing new things not only thinking new things—the suggestion that creativity is limited to idea generation and excludes implementation does not do justice to research in creativity at work in which implementation is typically implied. Moreover, studies of individual and team innovation that try to distinguish in measurement between idea generation and implementation often end up combining these into one measure because of high intercorrelations (e.g., Janssen &

Van Yperen 2004, Eisenbeiss et al. 2008)—presumably because idea generation that is observable to raters often results in idea implementation. For the body of research reviewed then, there is a good case for not only looking at studies of team innovation but also of team creativity (see, also, Hülsheger et al. 2009). Presaging things to come, I revisit the issue of implementation after the main body of the review to argue that research in team creativity and innovation in organizational psychology and organizational behavior has paid less attention to the unique challenges that implementation can bring than is desirable for a full understanding of team innovation.

A team is understood here as a group of people at work sharing the responsibility for tasks that can be defined at the group level and that are interdependent in the execution of these tasks (see, also, Kozlowski & Bell 2003). For team innovation, this does not necessarily mean that innovation needs to be the primary task of the team (e.g., as in new product development) or that the team needs to be explicitly charged with the task of innovation as one of its tasks. Innovation can occur in a wide range of jobs and teams, even when teams designed for innovation, such as R&D teams (e.g., Eisenbeiss et al. 2008), or carrying the end responsibility for innovation within the organization, such as top management teams (TMTs) (e.g., Bantel & Jackson 1989), may be the more obvious teams on which to focus team innovation research.

In reviewing the literature, I set out to provide a representative—not exhaustive—coverage of the published empirical (i.e., quantitative) research in team innovation and team creativity (excluding research that is purely about idea generation and does not at least also include team idea selection and development). A first, albeit modest, integration I propose is that this research can by and large be grouped into two main themes, and these also provide the structure for the review. The first theme is the knowledge integration perspective in which innovation is seen to follow from the integration of information and perspectives. The second theme is the team climate perspective in which innovation is seen to flow from team climate characterized by support for innovation, member participation, and shared commitment to team (innovation) objectives. The main conclusions regarding a research agenda to advance team innovation research linked to this thematic structuring are to more fully develop theory underlying the team climate perspective, and to develop theory about cross-linkages of these perspectives.

An equally important takeaway, however, is in its conclusion about a perspective that is under-represented, which is the study of the problems associated with getting from idea development to idea implementation. Research in organizational psychology and organizational behavior tends to implicitly treat team innovation as something that can be effectuated locally in the team. The implicit assumption seems to be that when the team comes up with a creative idea, it can implement it (or it will be implemented). This assumption may be justified for some teams and some innovations (e.g., management innovations by a TMT). The organizational innovation literature outside of organizational psychology and organizational behavior has emphasized, however, that this assumption is not justified for many innovations. For many innovations, idea generation is less challenging than idea implementation, and an important part of the innovation process is to mobilize the necessary support and resources from outside of the team. There thus is a clear need to study team innovation not only from the perspective of team dynamics but also from the perspective of the team's external actions within the organization and in terms of the external context in which it is embedded to bring creative ideas to implementation.

## A TEAM INNOVATION REVIEW IN TWO THEMES

### The Knowledge Integration Perspective

The key driver of creative idea development probably is knowledge integration. New insights follow from the integration of diverse information, knowledge, ideas, or perspectives. Whereas

exposure to diverse knowledge, expertise, and perspectives may also stimulate creativity for individual team members (Richter et al. 2012) or individuals embedded in a social network (Zhou et al. 2009), teams are the natural home for such information integration processes (Ancona & Caldwell 1992). Indeed, one of the primary reasons to charge teams rather than individuals with innovation is teams' potential to bring together members with different knowledge, expertise, and perspectives. The basic proposition here would then also be straightforward: Teams are more innovative the more they bring together members with diverse backgrounds and engage in a process of team information integration. In team innovation research, we see this perspective primarily reflected in two streams of research: The first is research on team diversity (emphasizing the informational resource) and the second, research on team information integration (emphasizing the team process).

**Team diversity.** Consistent with the broader information integration perspective in team diversity (van Knippenberg & Schippers 2007), a major notion in team innovation research is that team innovation benefits from team diversity. The basic logic here is straightforward: The more team members bring different perspectives—knowledge, information, expertise—to the team, the larger the pool of informational resources the team can draw on and the greater the potential for synergetic benefits from integrating perspectives. Team creativity and innovation should be one of those synergetic benefits. Meta-analyses support the basic idea that diversity is a positive influence on team innovation, but only for job-related diversity—diversity in functional background, educational background, or similar job knowledge-related attributes—and not for demographic diversity—diversity in gender, race/ethnicity, or age (Bell et al. 2011, Hülsheger et al. 2009, van Dijk et al. 2012). At the same time, the most recent and most comprehensive of these meta-analyses also suggests that these diversity effects are moderated (i.e., there is heterogeneity of effect sizes)—without being able to account for this moderation (van Dijk et al. 2012). The conclusion thus is not simply that certain forms of diversity lead to team innovation whereas others do not (even when job-related diversity may be more likely to result in diversity), but rather that we need to identify moderating influences in the diversity-innovation relationship. Herein lies the need for a narrative review and future research to more fully integrate and develop the diversity perspective in team innovation research.

Landmark research by Ancona & Caldwell (1992) set the stage for the diversity perspective showing that team functional background diversity predicted team innovation, mediated by team member external communication. This received follow up in other evidence of diversity main effects. Drach-Zahavy & Somech (2001) found that team functional background diversity was positively related to team innovation mediated by the team processes of information exchange, learning, motivating, and negotiating. Very similar findings were found by Somech & Drach-Zahavy (2007), who also identified frequency of meetings as another influence on these mediating processes. Somech & Khalaili (2014) focused on functional background diversity and interteam goal interdependence, and found that positive relationships with innovation were mediated by boundary spanning (a positive influence) and boundary building (a negative influence). (The interteam goal interdependence–boundary spanning–innovation path was replicated by Benoliel & Somech 2015.) With a focus on member trait diversity, Miron-Spektor et al. (2011) found that diversity in terms of mixing creative and conformist members as compared with more homogeneous member trait composition enhances team innovation, mediated by team potency. Schilpzand et al. (2011) found that diversity in openness to experience (a personality trait) was positively related to team creativity.

Because evidence of a main effect of diversity does not negate the conclusion that diversity effects on team innovation are moderated, several studies also focused on moderation in the relationship between team diversity and team innovation. Somech (2006) found that team functional

background diversity was related to team innovation with higher levels of participative leadership, which presumably stimulates information integration. Fay et al. (2006) found that functional background diversity interacted with team climate understood to be supportive of innovation (more on this in the team climate section) in affecting innovation, such that functional background diversity was more positively related to team innovation with a more supportive climate. In a different twist to a similar understanding of team climate, Somech & Drach-Zahavy (2013) showed that functional background diversity and member creativity predicted team creativity, but that team creativity only translated into team innovation to the extent that there was a team climate supportive of innovation. Mitchell & Boyle (2015) arguably also focused on a climate expression in studying the moderating role of open-mindedness norms. They found that functional background diversity was related to team innovation to the extent that the team had open-mindedness norms, mediated by professional identity salience. In an attempt to capture the essence of the team diversity perspective on team creativity, Hoever et al. (2012) experimentally showed that member perspective taking (i.e., trying to understand the other members' point of view) moderated the effect of team diversity of perspectives on team creativity, mediated by team information elaboration (i.e., information exchange and integration).

Shin & Zhou (2007) studied transformational leadership as a moderator of the relationship between educational background diversity and team creativity, mediated by team creative efficacy, and Reuveni & Vashdi (2015) studied the moderating role of transformational leadership in the relationship between functional background diversity and team innovation as mediated by a shared mental model of team processes. Whereas these studies are valuable in identifying mediating processes, they come with an important caveat regarding the moderator variable transformational leadership that is associated with insurmountable validity problems. Because there are several team innovation studies considering transformational leadership in addition to these two, it is worth concisely describing the issue here. As van Knippenberg & Sitkin (2013) outline, charismatic-transformational leadership is a problematic construct beyond repair because (a) it is defined in terms of its effectiveness, rendering the study of its effects meaningless (i.e., if it does not result in the desired team innovation, it is by definition not transformational leadership); (b) it lacks theory to explain its multidimensional structure (i.e., the dimensions capture a taxonomy not based on theory, and there is no theory explaining how they in combination form transformational leadership) and to differentiate it from noncharismatic-transformational leadership; and (c) its measurement is unable to reliably replicate its multidimensional structure, confounds leadership with its perceived effects, and is not empirically distinct from noncharismatic-transformational leadership or ratings of leadership effectiveness. The inescapable conclusion is that evidence regarding transformational leadership is invalid, and here I focus on studies of transformational leadership only when they also yield other evidence that is not compromised by this validity problem.

Beyond job-related diversity, there is also evidence of the benefits of team diversity (consistent with the notion that the information integration benefits may hold for all diversity attributes; van Knippenberg et al. 2004). Homan et al. (2015) found that nationality diversity was positively related to creativity, mediated by team efficacy, provided team members either believed in the value of diversity at team composition or where brought to such beliefs through diversity training (also see Miron-Spektor et al. 2011, Schilpzand et al. 2011).

All this is not to say that if anything the effect of diversity is positive. Research in team diversity has documented how diversity is a double-edged sword with the potential not only to enhance team performance (i.e., because of information integration benefits) but also to disrupt team performance (i.e., as a result of social categorization processes; van Knippenberg & Schippers 2007), and there is evidence that team innovation is no exception to this rule. Chi et al. (2009) studied tenure diversity effects as moderated by team-oriented human resource (HR) practices (e.g., teamwork

training) in R&D teams in Taiwan. They found that tenure diversity was increasingly detrimental to innovation (i.e., a curvilinear relationship), but that this negative influence was counteracted by HR practices.

It is also worth mentioning that once the focus in the study of team diversity is on the TMT—the team with the end responsibility for organizational innovation—TMT diversity and process can be shown to predict organizational innovation (Bantel & Jackson 1989). Here too a moderator perspective holds. Alexiev et al. (2010) found that TMT diversity (functional and demographic combined) interacted with the team's internal and external advice networks. Organizational innovation benefited more from a well-developed TMT internal advice network (consistent with the need for team communication for information integration), whereas TMT diversity in a sense substituted for the positive influence of an external advice network on innovation (consistent with the notion that diversity gives a team access to more diverse knowledge, as would a well-developed external network). Wei & Lau (2012) studied TMT network, functional, tenure, and age diversity in China, focusing on the moderating role of a global rating of teamwork effectiveness (see, also, climate in the Fay et al. 2006 study). Network diversity was positively related to organizational innovation for high-quality processes, for other attributes diversity and teamwork seemed to substitute for each other's influence.

A related perspective is on dissent. Dissent represents diversity of perspectives and in that sense is a form of diversity, but it is not necessarily tied to the composition attributes typically studied in diversity research (i.e., job-related diversity, demographic diversity, trait diversity; van Knippenberg & Schippers 2007) and can be more emergent in team process (see, also, van Knippenberg & Mell 2016). That said, there is a good case to expect dissent to have the potential to fuel information integration synergies that have innovation benefits, just like diversity. By the same token, it stands to reason to expect these effects to be moderated. Consistent with this reasoning De Dreu & West (2001) found that dissent interacted with team member participation such that dissent only benefited team innovation to the extent that team members participated in the team. De Dreu (2002) reported how dissent is positively related to team innovation to the extent that the team engages in team reflexivity (the collective consideration of team objectives and processes to learn and improve). Nijstad et al. (2014) found that dissent was positively related to innovation to the extent that there was psychological safety in the team (i.e., the sense that one can freely speak one's mind; Edmondson 1999).

As per Gibson & Gibb (2006), geographic dispersion can be seen as also capturing diversity even when it captures more. Gibson & Gibb (2006) focused on the challenges of virtual teamwork—geographic dispersion, nationality diversity, electronic dependence, and structural dynamism—and showed how these can be bad for innovation and attenuated by communication climate. Tzabbar & Vestal (2015) observed an inverted-U curvilinear relationship between geographic dispersion and team innovation that was moderated by relational strength and status equality. (Higher values of both moderators were associated with a more extended range in which geographic dispersion was positively related to innovation.)

An assessment of these studies of team diversity and related variables learns that there is pretty consistent evidence that job-related diversity can be positively related to team innovation, which is no surprise in view of the current meta-analytic evidence out there. Importantly, however, consistent with the van Dijk et al. (2012) meta-analysis, there is also evidence for moderation in these relationships. Even when these moderators go under a variety of labels, what they seem to have in common is a focus on encouraging the free exchange of perspectives: open-mindedness, perspective taking, psychological safety, participative leadership, communication climate, diversity beliefs, relational strength, status equality, advice network, teamwork HR practices, a climate supportive of innovation, and reflexivity. This would indeed be core to the innovation benefits



of diversity as understood conceptually, and moreover consistent with the well-supported notion from team diversity research more broadly that diversity's positive performance effects (i.e., including creativity and innovation) are contingent on factors encouraging information elaboration (van Knippenberg et al. 2004). A review such as the current one is not a strong basis to reduce all these identified moderators to one variable—a team's shared focus on information exchange and integration (see, also, van Knippenberg et al. 2013)—but it does beg the question for future empirical research to answer as to what extent these moderators can indeed be so reduced.

The emphasis in team innovation research is clearly on the positive effects of job-related diversity. This makes sense from the perspective that job-related diversity may be where these positive effects may be most easily obtained (Hülsheger et al. 2009, van Dijk et al. 2012). Even so, in diversity research more broadly there is evidence that demographic diversity may also have positive effects but that preventing negative effects associated with social categorization processes is more of a concern for demographic diversity than for job-related diversity (van Knippenberg & Schippers 2007). From that perspective, team innovation research may more fully develop its understanding of the role of team diversity by more systematically looking beyond job-related diversity and also considering moderators associated with the prevention of diversity's negative social categorization effects in complement to moderators associated with the encouragement of information elaboration.

As with the moderation evidence, the mediation evidence seems to some extent to concern different labels for similar processes. Consistent with the notion that the core reason for diversity's positive effect on innovation revolves around the benefits of knowledge integration, there is evidence that the diversity-innovation relationship is mediated by information elaboration or related constructs such as information exchange and learning. The finding that external communication (boundary spanning, the absence of boundary building) also plays a mediating role is consistent with the notion that part of diversity's informational benefits derive from the more diverse external network it brings (Ancona & Caldwell 1992) and also directly in line with the knowledge integration perspective. Even so, the knowledge derived from the external network would have to be integrated internally, and in that sense, this seems a mediating process in support of the core information-elaboration process. In this respect, it is also noteworthy that the Hülsheger et al. (2009) meta-analysis identified both internal communication and external communication as process predictors of team innovation. The finding that team potency, efficacy, or creative efficacy mediates is consistent with the idea that awareness of the benefits of diversity (i.e., which would invite a positive relationship between diversity and potency/efficacy) can stimulate teams to engage with their diversity to realize those benefits (van Knippenberg et al. 2013). Even so, it would seem that this process would be facilitating team information elaboration as the core mediating process rather than being core to diversity's effect on innovation. Future research bringing together these three mediating processes—information elaboration, external communication, and team efficacy—would therefore be valuable to determine how they relate to each other in translating team diversity into team innovation.

It is less obvious that motivating, negotiating, professional identity salience, and a shared mental model for teamwork would follow from team diversity as core processes mediating its relationship with innovation (even when they may all be helpful processes), or how these processes should be seen in relationship to the processes of information elaboration, external communication, and team efficacy. To put these processes more firmly on the agenda for future research in diversity and innovation, it would therefore be important to more clearly establish how these processes are positioned vis-à-vis more obviously mediating processes, and why they would be mediating rather than moderating processes (i.e., even when they help benefit from diversity, this does not mean they follow from diversity).

**Information integration.** Team diversity research emphasizes how team diversity creates informational resources from which team innovation can benefit when exchanged and integrated. The second stream of research closely tied in with this knowledge integration perspective puts the information integration process itself at center stage. Even when diversity may capture the potential of the to-be-integrated informational resource, different people know different things and at any given level of diversity the same logic should hold: All other things being equal, teams should be more innovative the more they engage in information integration. This notion is supported by meta-analytic evidence from Hülshager et al. (2009) who report positive relationships for internal communication. There is also evidence that goes beyond this meta-analytic main effect. It may also be noted that communication does not equal knowledge sharing, and some caution is in order in concluding that the communication finding from the Hülshager et al. meta-analysis revolves around knowledge integration.

Jin & Sun (2010) studied R&D teams in China and found that knowledge sharing and knowledge integration predicted team innovation, and were predicted by attitude toward interdisciplinary work. Possibly related to such attitudes, Kessel et al. (2012) found that psychological safety predicted knowledge sharing, which predicted team creativity. Jiang et al. (2014) found in a study in China that knowledge sharing predicted innovation and was predicted by task interdependence. Hu & Randel (2014) observed that social capital (i.e., as a source of knowledge) and extrinsic incentives for knowledge sharing predicted knowledge sharing, which in turn predicted innovation. In a study in Korea, Sung & Choi (2012) showed that team knowledge utilization was positively related to team creativity to the extent that the leader was low on systematic cognitive style (i.e., because high on this style would presumably imply a more directive style that interferes with the creative process), and with higher environmental uncertainty. They also observed that leader cognitive style moderated the positive influence of team knowledge stock.

Hu et al. (2012) found that knowledge sharing predicted innovation mediated by leader-member exchange and team-member exchange, and that the relationships of these social exchange variables with team innovation were stronger with higher trust. Given that trust is a strong correlate of social exchange quality and the quality of the relationship arguably is as likely a cause as a consequence of information exchange, it is not clear how much faith should be put in this particular causal model, but the evidence for the knowledge sharing-innovation relationship adds to the overall picture. Similar observations hold for Jin & Zhong's (2014), who find that in a sample of Chinese teams perceived organizational support predicted knowledge integration, which predicted team climate for innovation, which in turn predicted innovation. It is not obvious that knowledge sharing would predict innovation climate and not (also) the other way around, but the evidence for the knowledge sharing-innovation relationship seems unambiguous.

There is also some evidence that speaks to information integration more by implication, such as evidence concerning social networks, which have typically been seen as sources of information to stimulate creativity and innovation (e.g., Zhou et al. 2009). In a study in China, Jia et al. (2014) observed that the density of the team communication network predicted team creativity for more complex tasks. Chen (2009) found that both the team internal and external social network predicted team innovation in Taiwanese project teams. Perry-Smith & Shalley (2014) showed that external ties (diverse ties and weak ties, which are both associated with access to diverse information) were positively related to team creativity. Han et al. (2014) found in a study of teams in Taiwan that external ties were a positive influence on team creativity to the extent that there were strong internal ties (see, also, the notion articulated above that external communication would need to feed into information elaboration to affect team innovation).

Speaking to team information processing through a focus on transactive memory systems—the shared process of knowing and using a team's distributed knowledge—Gino et al. (2010) found



that team creativity benefits more from team direct experience with the task than from indirect experience, mediated by transactive memory system. More indirectly speaking to information integration, Walter & van der Vegt (2013) focused on team performance feedback as a form of information and found that team member positive mood was conducive to the use of team performance feedback for individual learning behavior, which predicted team innovation.

A first conclusion from this work within the information integration perspective is that many of the findings reviewed here align well with those reviewed for team diversity studies. Antecedents of information integration obviously include diversity, and some of the antecedents studied from the information integration perspective can either be understood as moderators of diversity's effects—attitude toward interdisciplinary work, psychological safety, task interdependence, presumably also extrinsic incentives for knowledge sharing—or as indicative of access to informational resources—social capital. The alignment is not as strong for the moderators studied, where diversity research would typically see these as moderators of the extent to which information integration occurred rather than of the effects of information integration (see, also, van Knippenberg & Schippers 2007). That said, notions of environmental uncertainty and task complexity align well with the proposition in diversity research that information integration is more important for team performance (and thus more likely to be obtained) for some tasks and contexts than for others (van Knippenberg et al. 2004). Notions of trust and leader style would from the diversity perspective probably be seen more as predictors of information integration than as moderators of its effects. Given that information integration captures what is possibly the key team process in team innovation, a focus on mediators of the information integration–innovation relationship is perhaps less obvious. In line with this observation, and as per the discussion in the previous, the identified mediators of the information integration–innovation relationship do not seem to form strong causal models conceptually.

**Conclusions from the knowledge integration perspective.** The knowledge integration perspective brings together two questions in understanding the role of team knowledge integration in team innovation: What gives a team the informational resources to be innovative, and what leads a team to use its informational resources to be innovative? Diversity research tackles both questions but only from the perspective of team composition. Other research on information integration shows that there are other ways in which teams can build informational resources such as by building external social networks. Bringing these perspectives together more systematically would be important to further develop the knowledge integration perspective. Ideally, then, future research would more systematically study the different ways in which team informational resources can be built (team composition, team social network building, others) in combination with the factors that stimulate teams to use these resources in innovation efforts. As discussed in the assessment of diversity research, this would also include consolidation efforts in the study of moderators and mediators, and a broader-ranging approach to team diversity.

Building the knowledge integration perspective in team innovation research may also benefit from drawing more on studies of diversity, distributed information, and knowledge integration outside of the team innovation domain. The picture to emerge from the current state of the science in the knowledge integration perspective is remarkably well-aligned with this broader body of research (see, e.g., van Knippenberg & Mell 2016), and it would not seem unreasonable to expect that the knowledge integration perspective can further benefit from drawing upon this broader body of work, for instance in developing its understanding of the role of team cognition (i.e., understandings of the team and its tasks; Salas & Fiore 2004) such as reflected in the role of transactive memory systems (Brandon & Hollingshead 2004) and diversity mindsets (van Knippenberg et al. 2013).

It is clear that efforts in developing this perspective further can be efforts well spent. The evidence that knowledge integration is conducive to team innovation is clear, as is the evidence that factors contributing to the team's informational resources are conducive to innovation, contingent on factors stimulating the use of these informational resources.

## The Team Climate Perspective

Following Schneider & Reichers (1983), team climate can be defined as team members' shared perception of the atmosphere created by practices, procedures, and rewards within the team. At the organizational level, such practices would include a variety of formal practices such as HR practices, incentives systems, and the like, but at the team level (i.e., implying within-organization differences between teams) climate by and large captures behavioral patterns of team members and leaders. In that sense then, team climate captures the shared experience of working in the team as this is shaped by team interaction patterns and the implicit or explicit message these patterns convey about what is seen as appropriate and inappropriate, desirable and undesirable by the team. Climates thus have descriptive elements as well as more normative elements; climate as "the way we do things around here" captures both how we do things and how we believe things should be done.

In innovation research the team climate perspective is a major perspective in which climate is more specifically understood as climate for innovation. This perspective has been strongly shaped by the work of West (1990) and colleagues in developing their notions of team climate for innovation, and a major body of work reviewed here is in that tradition. A second perspective reviewed here focuses on cooperative goals and/or shared identity. It is similar enough to group with the team climate for innovation perspective (e.g., which includes shared commitment to team objectives, akin to cooperative goals) but different enough to review as a separate entry.

**Team climate for innovation.** West (1990) and colleagues proposed that team climate for innovation has four elements (names for some aspects have varied over time): support for innovation (expectation and support for the pursuit of innovation), shared objectives/vision (shared commitment to team objectives), task orientation/climate for excellence (shared commitment to excellence in performance), and participation safety (feeling that all can participate and speak their mind). They also developed their associated measurement in the team climate inventory (TCI; Anderson & West 1996, 1998). The logic here is that team innovation benefits when members share a commitment to team objectives and excellent performance, members see innovation as a desirable part of this pursuit, and all members feel they can freely contribute to this pursuit. As either separate dimensions or combined TCI measure (the dimensions tend to be quite highly correlated), this understanding of climate is expected to be positively related to team innovation. Evidence tends to consistently support that proposition, for instance in earlier work by Burningham & West (1995) and West & Anderson (1996); in other evidence later on (e.g., Bain et al. 2001, Pirola-Merlo 2010); as well as in the meta-analysis by Hülsheger et al. (2009).

Other research also connects with the team climate for innovation perspective but focusing on some of the dimensions or related conceptualizations of climate dimensions. Pearce & Ensley (2004) found that shared vision predicts team innovation. Chen et al. (2013) found that support for innovation was positively related to team innovation, a relationship also observed by Paulsen et al. (2013) who in addition showed that team identification was positively related to innovation. Eisenbeiss et al. (2008) introduced a twist to the study of team climate for innovation in studying the interaction between support for innovation and climate for excellence, showing that support for innovation only predicted team innovation to the extent that the team also had a climate for excellence.

Other research has built on the team climate for innovation perspective to identify antecedents of team climate for innovation. West et al. (2003) describe how leadership clarity predicts team climate for innovation, which in turn predicted innovation. Mathisen et al. (2008) showed that team member creative personality predicts team climate for innovation, which predicted innovation. Nsenduluku & Shee (2009) found that organizational support for innovation, organizational empowering climate, and at the team-level task design, organizational citizenship behavior, and group efficacy predict team climate for innovation, which predicted innovation.

Some of this work also focused on specific or related dimensions. Rousseau et al. (2013) showed that team coaching predicted both goal commitment and support for innovation, which were positively related to innovation. Post (2012) found that sequential thinking style reduced psychological safety and therefore was negatively related to innovation, whereas connective thinking style was positively related to cooperative learning and therefore positively related to innovation. Gajendran & Joshi (2012) report that leader–member exchange interacted with frequency of leader–member communication, resulting in more participation in decision-making (see, also, participation safety) in globally distributed teams, which in turn predicted team innovation. Peltokorpi & Hasu (2014) found that the advantage of participative safety for team innovation was more apparent in larger teams. Hülshager et al. (2009) also established a positive relationship between team size and team innovation, presumably consistent with the informational resource perspective). Focusing on trust, which has clear parallels with participation/psychological safety (see, also, West 1990), Gong et al. (2013) observed that team learning goal orientation was positively related to team innovation and more so with greater trust, whereas team performance–approach goal orientation was positively related to team innovation but less so with greater trust. Team performance–avoidance goal orientation was negatively related to team innovation.

Asking a bit more from our willingness to assume they concern related concepts, some other studies can also be seen as consistent with the climate for innovation perspective. Rietzschel (2011) found that team promotion focus, which would presumably relate to support for innovation (see, also, van Knippenberg et al. 2013), predicted idea generation and idea promotion but not idea implementation. Other studies focused on empowering leadership, which encourages self-directed teamwork (Kirkman & Rosen 1999) and in that sense with some caution could be seen as a proxy for participation safety. Burpitt & Bigoness (1997) found that empowering leadership was positively related to team innovation, and Hoch (2013) found that this held for both empowering leadership from the team leader and shared empowering leadership (i.e., empowering leadership behaviors displayed by all team members). Hon & Chan (2013) observed that empowering leadership's positive influence on team creativity was stronger with greater task interdependence, mediated by team creative efficacy and team self-concordance.

Perhaps stretching the willingness to assume overlap with climate for innovation a bit more, Shin & Eom (2014) focused on team creative efficacy and risk-taking norms, which arguably would be associated with support for innovation, and found that they were positively related to team creativity mediated by team proactivity. Focusing on high work demands and poor quality of the work environment as factors that could stimulate innovation—presumably out of a desire for improvement that might spark something akin to support for innovation—Schipper et al. (2015) studied how these factors were positively related to the extent that teams engaged in team reflexivity.

Beyond the unsurprising confirmation of the conclusion from the Hülshager et al. (2009) meta-analysis that team climate for innovation is positively related to innovation, an assessment of the work on team climate for innovation and related concepts also invites some more critical considerations. A first consideration in this respect is that it would be good if the field moved toward construct consolidation and determined which seemingly overlapping and related shared psychological states (i.e., as a shared perception climate ultimately is a shared psychological state

even when it presumably is firmly rooted in more objectively observable actions) are conceptually and empirically distinguishable climate elements core to innovation. This includes creating clarity over the similarity or difference between variables such as participation safety, psychological safety, and trust. It also includes critically considering whether a four-dimensional view of team climate for innovation as captured by the TCI tradition is the most parsimonious given that the dimensions tend to be highly correlated. For instance, it would be worth considering the possibility that commitment to a shared vision/objective and commitment to excellence in performance might be more parsimoniously captured by a single factor also when it would entail redefining not only the concept but also its measurement.

At least as important as these construct consolidation efforts would be to critically consider the current additive model of team climate for innovation. Regardless of whether climate is understood as the combined TCI score or as the influence of more than one dimension in combination, it seems that with the exception of the Eisenbeiss et al. (2008) study all studies have treated climate dimensions as having additive influences (i.e., rather than interactive)—either operationalized as independent main effects in an analysis with multiple dimensions or in summing/averaging dimension scores to create the TCI score. However, it would seem reasonable to explore interactive influences too. For one, it seems overly simplistic to assume—as the summing in one TCI score implies—that it does not matter whether for example a team scores high on shared objectives and low on participation safety or low on shared objectives and high on participation safety, as long as it yields the same sum score. Eisenbeiss et al.'s work is one example of a conceptual analysis pointing to an interactive influence that argues against this implicit interchangeability logic, but other interactions are also conceivable without too much difficulty. For instance, the empowering climate captured by participation safety may be more effective in stimulating innovation when its motivating influence is channeled in the direction of innovation by support for innovation or by shared team objectives that would require innovation. It is easy to see that the tendency for the TCI to yield high correlations between dimensions makes interaction effects less likely, but as per the previous point a development toward a more clearly distinct set of (fewer) dimensions—potentially with other measurements—would also break new ground for the exploration of such interactive influences.

Given the consistent evidence that team climate for innovation predicts innovation, another obvious avenue for future research would be to more systematically study its antecedents. The current evidence base suggests that both member characteristics and leadership may shape innovation climate. On both counts, however, there is no theory to integrate different studies on leadership or team composition, let alone to integrate these two research foci into a more comprehensive model of antecedents. From the perspective of yielding actionable knowledge then, an important challenge would be to develop this aspect of climate for innovation research.

**Cooperative goals.** A related research focus that is perhaps better described as climate-like than as climate is research on cooperative goals and shared identity. These variables are somewhat related to the shared objectives notion from team climate for innovation research, but at the same time also draw more from a different tradition in cooperation and conflict. The basic notion here would be that for teams to be innovative, teamwork with a focus on shared goals is important. Hülshager et al.'s (2009) meta-analysis corroborates this notion with evidence for positive influences of team cohesion and goal interdependence, and primary research adds further insights to this.

Tjosvold et al. (2004) showed in a study of team innovation in China that cooperative goals have a positive influence mediated by team reflexivity. In a related vein (and also in China), Wong et al. (2009) observed that cooperative goals predicted team potency and initiative,

which predicted team innovation, and Tjosvold et al. (2009) found that cooperative conflict management was positively related to group support for individual problem solving, which in turn was positively related to team innovation. Weingart et al. (2010) adds a complication to the picture by showing that cooperative conflict management in interaction with task conflict reduces differences in understanding of the teamwork, but that such differences in understanding can actually benefit team innovation. Barczak et al. (2009b) found that cooperative climate predicted team creativity and was predicted by team emotional intelligence mediated by trust. Paulsen et al. (2009) found that cooperation was positively related to innovation and predicted by team identification, a finding that was replicated in Desivilya et al.'s (2012) study of cooperative conflict management and extended by identifying relationship conflict as another (negatively related) antecedent of cooperative conflict management. There is also evidence from China to suggest that when the focus is on the TMT, the positive influence of cooperative goals on team process and team innovation extend to organizational innovation (Chen et al. 2005, 2006).

Focusing on team identification, Liu & Phillips (2011) report that team identification predicted innovation mediated by knowledge sharing intention. Wang & Zhu (2011) focused more specifically on team creative identity and observed a positive relationship with team creativity. Mitchell et al. (2012) found that identification was predicted by perceived value congruence and interacted with profession as a salient category to predict innovation. Related to these notions of identification, Yoshida et al. (2014) reported that servant leadership predicted team innovation in a sample with teams from China and Indonesia, mediated by the extent to which the leader was perceived to be representative of the shared social identity.

One angle on the role of cooperation and identity is that it reduces conflict or leads teams to more constructively deal with their conflict, and a related set of studies focuses on task conflict per se. Xie et al. (2014) found a curvilinear inverse-U-shaped relationship between task conflict and team innovation moderated by knowledge integration capability such that the positive influence of task conflict is extended with greater knowledge integration capability. De Dreu (2006) replicated this curvilinear relationship, but Kratzer et al. (2006) did not and found a negative relationship between task conflict and innovation. In a study in China Fahr et al. (2010) do replicate the curvilinear relationship and show that it is moderated by the timing of task conflict such that only conflict relatively early in the team's life cycle benefits team innovation.

Theory and evidence converge on the conclusion that a cooperative climate and shared team identification are conducive to team innovation. It is less clear, however, that the related focus on task conflict can be understood to speak positively to the role of task conflict. Meta-analyses of the relationship of task conflict with innovation suggest there is none (Hülsheger et al. 2009, O'Neill et al. 2013). Evidence that the relationship can be positive such as on part of the range covered by observations of a curvilinear relationship is also open to debate. The issue here is that task conflict in this perspective is seen as a proxy for or precursor to information elaboration, whereas the case for this is conceptually weak (van Knippenberg et al. 2004) and empirically not supported in a direct comparison of the roles of task conflict and information elaboration in team creativity (Hoever et al. 2012). Consistent with broader indications that the actual evidence speaks against the often presumed positive effects of task conflict (De Wit et al. 2011), it seems time to let go of the notion that task conflict is a good thing for innovation and instead emphasize the process it is often erroneously presumed to stimulate—information integration.

An obvious question for future research in the team climate perspective is how cooperation and shared identity relate to team climate for innovation. As noted in the previous section, it seems reasonable to expect that there is at least partial overlap with the notion of shared objectives. Efforts to develop the team climate for innovation perspective to produce an understanding of team climate

for innovation based on more clearly distinct elements would therefore ideally also take on notions of cooperation and identity—or alternatively clearly define and empirically establish how these elements should not be seen as part of team climate.

## Other Perspectives

The knowledge integration and team climate perspectives are clearly the main perspectives in team innovation research. This is not to say that team innovation research can be completely reduced to these two perspectives, and here I aim to capture some of the other themes emerging in team innovation research in organizational psychology and organizational behavior. In the previous review I have grouped some studies under the knowledge integration and team climate perspectives for which this grouping may be less obvious than for others, and in this section I review studies that perhaps could also be grouped under one of the preceding themes. In that sense it is important to realize that what I offer in this review is post hoc integrative structuring, which will not be a perfect fit for each and every individual study.

The most obvious third perspective to identify is that on team innovation as emerging from the creativity and innovativeness of individual team members. We could call this the aggregation of individual inputs perspective. The basic logic here is simple: Team innovation derives from the creativity of team members, so the more creative team members are, the more innovative the team is. This notion goes back to early work by Triandis et al. (1963), who showed that the influence of member creativity on team creativity could be captured both in an additive model (team creativity is predicted by the sum/average of individual member creativity) and in a disjunctive model (team creativity is predicted by the creativity of the team's most creative member; finding was replicated by Pirola-Merlo & Mann 2004). Other studies have tended to emphasize the additive model, and found support for it (e.g., West & Anderson 1996). However, other studies have extended it, for instance by mediating evidence for the role of support for creativity (Gong et al. 2013) or by moderation evidence. Taggar (2002) found that mean individual creativity predicted team creativity to the extent that team members engaged in creativity-relevant team processes, and Chen (2007) observed in a study of new ventures in Taiwan that member creativity was more predictive of team innovation the more the leader engaged in entrepreneurial leadership (understood as risk taking, proactive, and focused on innovation). Complicating the picture further, Taggar (2001) showed that the proportion of creative members was exponential related to team creativity to the extent that the team engaged in creativity relevant team processes, and Baer et al. (2008) showed similar exponential relationships for the proportion of members high on extraversion and openness to experience and low on conscientiousness, moderated by team creative confidence.

The importance of this set of findings lies in both determining the “base rate” observation that teams can be more innovative with more innovative members and in determining that enabling conditions are required to let this at first blush straightforward relationship materialize. Member creativity matters, but is not enough. The combination of these observations begs the integration with other perspectives in team innovation—an issue I address in the next section.

There are also other studies that are not easily categorized as part of either the information integration perspective or the team climate perspective, such as Černe et al.'s (2013) finding that authentic leadership is positively related to team innovation, Zacher & Rosing's (2015) study of ambidextrous leadership showing that the interaction of leadership stimulating divergence and leadership stimulating convergence positively affects team innovation, and Tsai et al.'s (2012) work showing that positive group affect is good only for team creativity with negative group affect and low trust. The issue here is not so much that these studies are obviously distinct from the main perspectives discussed, but more that they lack both the mediating evidence that would more



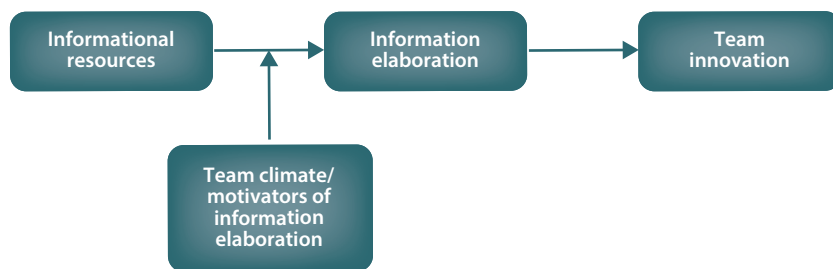
easily link them to either perspective and the conceptual framing to more clearly place them within either perspective. One takeaway from this kind of work thus is for future research to also explicitly address mediating processes and to more clearly position work within the broader context of team innovation research.

## Integrative Conclusions from a Review of Perspectives

In the previous discussion, I have already advanced several conclusions regarding the further development of the different perspectives in team innovation research. The obvious follow-up here is to look across perspectives and to identify integrative ways forward. In this respect, the most important conclusion probably is that team innovation research will benefit significantly when the knowledge integration perspective and team climate perspective are integrated. Research in the knowledge integration perspective revolves around the two following key questions: What gives teams the informational resources conducive to innovation? What stimulates teams to use those resources in innovation efforts? The high-level conclusion here is that team diversity and social networks provide informational resources and that the relationship between team informational resources and team knowledge integration is moderated. Research within this perspective has identified several moderating influences, but it seems obvious that the team climate perspective represents important moderators in this respect too. Indeed, a study such as Fay et al.'s (2006) with its evidence of an interaction between team functional diversity and team climate for innovation speaks to exactly this issue. Work such as Fay et al.'s as well as research on such issues as psychological safety and information elaboration (e.g., van Ginkel & van Knippenberg 2008) would suggest that team climate for innovation has a positive moderating influence on the relationship between team informational resources and team information elaboration. Bringing in other issues raised in the previous discussion, however, here too the conclusion holds that this integration would benefit from construct consolidation in team diversity moderator research and team climate research, and from extending these construct consolidation efforts to clarifying how moderators identified in the knowledge integration perspective relate to team climate dimensions.

In simplified form, **Figure 1** captures the research model that would flow from such integrative efforts, a model in which different ways to capture teams' informational resources predict team information elaboration contingent on moderating (climate) influences—and the core prediction being that team climate positively moderates informational resource effects—with team information elaboration being the core influence on team innovation.

The evidence for the contingent influence of individual member creativity suggests, however, that the issue is at least one step more complicated. The informational resources available to the team may be contingent on who is on the team (e.g., in terms of team diversity and team social



**Figure 1**

A knowledge integration/team climate model of team innovation.

networks), but members' ability to be creative may be an independent influence in this respect [compare with Amabile's (1988, 1996) notion that it takes both relevant expertise—compare with informational resources—and creative skills to be creative]. Further integration of perspectives would thus also establish how to position the role of member creativity/innovativeness within this integration. One obvious proposition in this respect would be to see this too as a moderator of the relationship between informational resources and knowledge integration, but with the current brief integrative review of the empirical evidence I refrain from adding to **Figure 1** beyond what is supported by the current evidence base.

## What's Missing? From Idea Development to Idea Implementation

The preceding review hopes to capture and integrate the current state of the science in team innovation research. As an integrative review of the empirical evidence, it is bounded by what is available in the current evidence base. In this section, I want to add one issue to the consideration set that I would identify as the most important issue currently underrepresented in the current evidence base: the step from idea development to idea implementation.

For many innovations (e.g., new product development, business model innovation), teams typically need to mobilize resources, support, and collaboration outside the team to make the innovation reality (e.g., Alexander & van Knippenberg 2014). This is no trivial observation: Most ideas for innovations never make it to implementation, and ideas that are more creative may often be less likely to be implemented because they carry a greater (perceived) risk of failure than more incrementally creative ideas. In that sense, the bigger challenge in team innovation may not be the development of innovative ideas but their implementation (Cooper 2008, Obstfeld 2005, West 2002a). From that perspective, it is a limitation of the current state of the science in team innovation research that idea development and idea implementation are typically combined without much consideration in the measurement of team innovation. As I noted in the introduction, this is usually based on the high correlation between the two in subjective ratings (i.e., which also justifies a focus on creativity in this review; see, also, Hülsheger et al. 2009). Studies with more objective measures of innovation (e.g., patents) would typically not also have an idea development measure. All this does not negate the fact that there is also a well-documented case that implementation in many cases does not automatically follow innovative idea development. A study such as Somech & Drach-Zahavy's (2013) is a case in point that there is value in considering the factors on which the implementation of innovative ideas is contingent. It would be important to further develop this aspect of team innovation research in the future.

In that respect, it is important to realize that the main challenges to implementation typically lie outside of the team (Leifer et al. 2000) in realizing support from senior management, collaborations with other departments, etc. In that sense, as important as is a study such as Somech & Drach-Zahavy's (2013) in demonstrating the value of explicit attention to implementation, it may not set the tone optimally by focusing on a moderating influence internal to the team (i.e., team climate). It would thus be particularly important for future research to focus on the role of the organizational context in which the team is embedded as well as the team's interaction with that external context (see, also, Alexander & van Knippenberg 2014).

## DISCUSSION

### A Research Agenda

A forward-looking way of capturing this review's key conclusions is to focus on the most important issues it raises for future research to address—a research agenda. As a summary of what went before,

**Table 1** An agenda for team innovation research, by perspective

Perspective	Key issues
Knowledge integration	Construct consolidation moderators Construct consolidation mediators Integrative study determinants of informational resources
Team climate	Construct consolidation climate for innovation Theory of interactive influences of climate elements
Integrating perspectives	Construct consolidation moderators, knowledge integration, and climate Construct consolidation mediators, knowledge integration, and climate Integrating team member creativity composition
Missing perspectives	Contingencies of the idea development–implementation relationship Cross-cultural similarities and differences

these issues are captured in **Table 1**. It is instructive to list these issues in this way to clarify the efforts needed even when integration of perspectives is not pursued, but it is important to note that the construct consolidation issues overlap in that seeking integration between perspectives would demand that construct consolidation issues for each perspective—as well as across perspectives—are addressed. It is also important to note that even when construct consolidation seems the less “sexy” challenge, to prevent the continued challenge of comparing across studies of obviously related but not unambiguously identical constructs, construct consolidation efforts would ideally precede or be part of efforts to address other challenges.

### Cross-Cultural Research

A final entry in **Table 1** has not been part of the discussion so far: cross-cultural research. Most team innovation research hails from “the West”—Northern America and Western Europe. There is, however, also a steady stream of research from Eastern Asia—mostly China—and I have tried to identify East-Asian research throughout this review. Raising the question of whether there are cross-cultural (cross-national) differences to be observed in team innovation and answering it based on the current review, the answer seems to be that there is no evidence of such cross-cultural differences. East-Asian research engages with similar research questions as the body of Western research and yields findings that are well-aligned with findings from Western research. The conclusion from the current review would thus be that the process under investigation in team innovation research—the contingent influences of team informational resources on team knowledge integration and innovation—is of such a fundamental nature that they are pretty universal. This is a conclusion that also aligns well with similar conclusions in research in individual creativity (Hirst et al. 2011).

At the same time, it is important to note that not a single study in this review set out with a focus on cross-cultural differences. When the focus has been on universal processes, this does not rule out the possibility that in addition to these universalities, there are more culture- or country-specific issues in team innovation too. One observation in this respect is that transition economies such as China and India are still “catching up” in terms of the level of technological sophistication in many industries. Such catching up requires innovation, but is done in a context where externally acquiring such innovations is a more realistic possibility—even when not necessarily the best way to innovate (Fan 2006). Team innovation in such countries may thus raise some unique questions (even when these questions may be tied to context more than culture). Future research taking the evidence of universal processes as a basis to build on for the study of potentially important

cross-cultural differences would be valuable in helping assess the boundaries to universality and to address context-specific research questions.

## Implications for Practice

Research in organizational psychology and organizational behavior aims to build fundamental theory, but does so against the backdrop of questions raised by organizational practice. An obvious question to consider therefore is what the implications for organizational practice are that follow from the current state of the science in team innovation research. These implications reflect the key issues as captured in **Figure 1**.

First, team innovation benefits from factors that provide the team with informational resources. These factors include team diversity and team external network. This has implications for team composition, but also beyond team composition because the team's external network building can be developed through focused efforts, and team knowledge stock can grow through member training. Team composition is also an issue in terms of team member creativity, with team innovation benefiting from more creative members on the team.

Second, having informational resources and using them in innovation efforts are two different things, and team innovation benefits from factors conducive to the use of the team's informational resources. Such factors include openness to diverse perspectives (both in terms of creating a situation in which all feel comfortable contributing and in terms of a focus on processing and integrating diverse insights) and shared and innovation-focused objectives. Leadership can be a strong influence on these factors even when leadership is not the only influence (see, also, van Knippenberg et al. 2013).

## CONCLUSION

Team innovation is a field of growing importance to research and practice. The current state of the science reflects the field as maturing rather than mature in terms of the issues that need to be addressed. Even so, moving forward the field is in good shape with well-grounded building blocks available for future integrations, in terms of construct consolidation as well as integration of perspectives, which stand to allow the field to make significant steps forward.

## DISCLOSURE STATEMENT

The author is not aware of any affiliations, memberships, funding, or financial holdings that might be perceived as affecting the objectivity of this review.

## LITERATURE CITED

- Alexander L, van Knippenberg D. 2014. Teams in pursuit of radical innovation: a goal orientation perspective. *Acad. Manag. Rev.* 39:423–38
- Alexiev AS, Jansen JJP, van den Bosch FAJ, Volberda HW. 2010. Top management team advice seeking and exploratory innovation. *J. Manag. Stud.* 47:1343–64
- Amabile TM. 1988. A model of creativity and innovation in organizations. *Research in Org. Behav.* 10:123–67
- Amabile TM. 1996. *Creativity in Context: Update to the Social Psychology of Creativity*. Boulder, CO: Westview
- Ancona DG, Caldwell DF. 1992. Bridging the boundary: external activity and performance in organizational teams. *Admin. Sci. Q.* 37:634–65
- Anderson N, Potočník K, Zhou J. 2014. Innovation and creativity in organizations: a state-of-the-science review, prospective commentary, and guiding framework. *J. Manag.* 40:1297–333

- Anderson N, West MA. 1996. Team climate inventory: development of the TCI and its applications in team building for innovativeness. *Eur J. Work Org. Psych.* 5:53–66
- Anderson N, West MA. 1998. Measuring climate for group innovation: development and validation of the team climate inventory. *J. Org. Behav.* 19:235–58
- Baer M, Oldham GR, Jacobsohn GC, Hollingshead AB. 2008. The personality composition of teams and creativity: the moderating role of team creative confidence. *J. Crea. Behav.* 42:255–82
- Bain PG, Mann L, Pirola-Merlo A. 2001. The innovation imperative: the relationship between team climate, innovation, and performance. *Small Gr. Res.* 32:55–73
- Bantel K, Jackson S. 1989. Top management and innovations in banking: Does the composition of the team make a difference? *Strateg. Manag. J.* 10:107–24
- Barczak G, Griffin A, Kahn KB. 2009a. Trends and drivers of success in NPD practices. *J. Prod. Innov. Manag.* 26:3–23
- Barczak G, Lask F, Mulki J. 2009b. Antecedents of team creativity: an examination of team emotional intelligence, team trust and collaborative culture. *Crea. Innov. Manag.* 19:332–45
- Bell ST, Villado AJ, Lukasik MA, Belau L, Briggs AL. 2011. Getting specific about demographic diversity variable and team performance relationship. *J. Manag.* 37:709–43
- Benoliel P, Somech A. 2015. The role of leader boundary activities in enhancing interdisciplinary team effectiveness. *Small Group Res.* 46:83–124
- Brandon DP, Hollingshead AB. 2004. Transactive memory systems in organizations: matching tasks, expertise, and people. *Org. Sci.* 15:633–44
- Burningham C, West MA. 1995. Individual, climate, and group interaction processes as predictors of work team innovation. *Small Group Res.* 26:106–17
- Burpitt WJ, Bigoness WJ. 1997. Leadership and innovation among teams: the impact of empowerment. *Small Group Res.* 28:414–23
- Černe M, Jaklič M, Škerlavaj MS. 2013. Authentic leadership, creativity, and innovation: a multilevel perspective. *Leadership* 9:63–85
- Chen G, Farh JL, Campbell-Bush EM, Wu Z, Wu X. 2013. Teams as innovative systems: multilevel motivational antecedents of innovation in R&D teams. *J. Appl. Psych.* 98:1018–27
- Chen G, Liu C, Tjosvold D. 2005. Conflict management for effective top management teams and innovation in China. *J. Manag. Stud.* 43:277–300
- Chen G, Tjosvold D, Liu C. 2006. Cooperative goals, leader people and productivity values: their contribution to top management teams in China. *J. Manag. Stud.* 43:1177–200
- Chen MH. 2007. Entrepreneurial leadership and new ventures: creativity in entrepreneurial teams. *Crea. Innov. Manag.* 16:239–49
- Chen MH. 2009. Guanxi networks and creativity in Taiwanese project teams. *Crea. Innov. Manag.* 18:269–77
- Chi NW, Huang YM, Lin SC. 2009. A double-edged sword? Exploring the curvilinear relationship between organizational tenure diversity and team innovation: the moderating role of team-oriented HR practices. *Group Org. Manag.* 34:698–726
- Cooper RG. 2008. The Stage-Gate® idea-to-launch process—update, what’s new and NexGen systems. *J. Prod. Innov. Manag.* 25:213–32
- De Dreu CKW. 2002. Team innovation and team effectiveness: the importance of minority dissent and reflexivity. *Eur. J. Work Org. Psych.* 11:285–98
- De Dreu CKW. 2006. When too little or too much hurts: evidence for a curvilinear relationship between task conflict and innovation in teams. *J. Manag.* 32:83–107
- De Dreu CKW, West MA. 2001. Minority dissent and team innovation: the importance of participation in decision making. *J. Appl. Psych.* 86:1191–201
- De Wit F, Greer LL, Jehn K. 2011. The paradox of intragroup conflict: a meta-analysis. *J. Appl. Psych.* 97:360–90
- Desivilya HS, Somech A, Lidgoster H. 2012. Innovation and conflict management in work teams: the effects of team identification and task and relationship conflict. *Negot. Conf. Manag. Res.* 3:28–48
- Drach-Zahavy A, Somech A. 2001. Understanding team innovation: the role of team processes and structures. *Group Dynam.* 5:111–23

- Edmondson A. 1999. Psychological safety and learning behavior in work teams. *Admin. Sci. Q.* 44:350–83
- Eisenbeiss SA, van Knippenberg D, Boerner S. 2008. Transformational leadership and team innovation: integrating transformational leadership and team climate models. *J. Appl. Psych.* 93:1438–46
- Fahr JL, Lee C, Farh CIC. 2010. Task conflict and team creativity: a question of how much and when. *J. Appl. Psych.* 95:1173–80
- Fan P. 2006. Catching up through developing innovation capability: evidence from China's telecom-equipment industry. *Technovation* 26:359–68
- Fay D, Borrill C, Amir Z, Haward R, West MA. 2006. Getting the most out of multidisciplinary teams: a multi-sample study of team innovation in health care. *J. Occ. Org. Psych.* 79:553–67
- Gajendran RS, Joshi A. 2012. Innovation in globally distributed teams: the role of LMX, communication frequency, and member influence on team decisions. *J. Appl. Psych.* 97:1252–61
- Gibson CB, Gibb JL. 2006. Unpacking the concept of virtuality: the effects of geographic dispersion, electronic dependence, dynamic structure, and national diversity on team innovation. *Admin. Sci. Q.* 51:451–95
- Gino F, Argote L, Miron-Spektor E, Todorova G. 2010. First, get your feet wet: the effects of learning from the direct and indirect experience on team creativity. *Org. Behav. Hum. Dec. Proc.* 111:102–15
- Gong Y, Kim TY, Lee DG, Zhu J. 2013. A multilevel model of team goal orientation, information exchange, and creativity. *Acad. Manag. J.* 56:827–51
- Han J, Han J, Brass DJ. 2014. Human capital diversity in the creation of social capital for team creativity. *J. Org. Behav.* 35:54–71
- Hirst G, van Knippenberg D, Chen CH, Sacramento CA. 2011. How does bureaucracy impact on individual creativity? A cross-level investigation of team contextual influences on goal orientation-creativity relationships. *Acad. Manag. J.* 54:624–41
- Hoch JE. 2013. Shared leadership and innovation. The role of vertical leadership and employee integrity. *J. Bus. Psych.* 28:159–74
- Hoever IJ, van Knippenberg D, van Ginkel WP, Barkema HG. 2012. Fostering team creativity: perspective taking as key to unlocking diversity's potential. *J. Appl. Psych.* 97:982–96
- Homan AC, Bungeler C, Eckhoff RA, van Ginkel WP, Voelpel SC. 2015. The interplay of diversity training and diversity beliefs on team creativity in nationality diverse teams. *J. Appl. Psych.* 100:1456–67
- Hon AH, Chan WWH. 2013. Team creative performance: the roles of empowering leadership, creative-related motivation, and task interdependence. *Cornell Hosp. Q.* 54:199–210
- Hu L, Randel AE. 2014. Knowledge sharing in teams: social capital, extrinsic incentives, and team innovation. *Group Org. Manag.* 39:213–43
- Hu MLM, Ou TL, Chiou HJ, Lin LC. 2012. Effects of social exchange and trust in knowledge sharing and service innovation. *Soc. Behav. Pers.* 40:783–800
- Hülsheger UR, Anderson N, Salgado JF. 2009. Team-level predictors of innovation at work: a comprehensive meta-analysis spanning three decades of research. *J. Appl. Psych.* 94:1128–45
- Ilgen DR, Hollenbeck JR, Johnson M, Jundt D. 2005. Teams in organizations: from input-process-output models to IMOI models. *Annu. Rev. Psych.* 56:517–43
- Janssen O, Van Yperen NW. 2004. Employees' goal orientations, the quality of leader-member exchange, and the outcomes of job performance and job satisfaction. *Acad. Manag. J.* 47:368–84
- Jia L, Shaw JD, Tsui AS, Park TY. 2014. A social-structural perspective on employee-organization relationships and team creativity. *Acad. Manag. J.* 57:869–91
- Jiang W, Gu Q, Wang GG. 2014. To guide or to divide: the dual-side effects of transformational leadership on team innovation. *J. Bus. Psych.* 30:677–91
- Jin L, Sun H. 2010. The effect of researchers' interdisciplinary characteristics on team innovation performance: evidence from university R&D teams in China. *Int. J. Hum Res. Manag.* 21:2488–502
- Jin L, Zhong Y. 2014. Contextual factors affecting the influence of perceived organizational support on team innovative performance. *Soc. Behav. Pers.* 42:517–28
- Kessel M, Kratzer J, Schultz C. 2012. Psychological safety, knowledge sharing, and creative performance in healthcare teams. *Crea. Innov. Manag.* 21:147–57
- Kirkman BL, Rosen B. 1999. Beyond self-management: antecedents and consequences of team empowerment. *Acad. Manag. J.* 42:58–74



- Kozlowski SWJ, Bell BS. 2003. Work groups and teams in organizations. In *Handbook of Psychology: Industrial and Organizational Psychology*, ed. WC Borman, DR Ilgen, RJ Klimoski, pp. 333–75. London: Wiley
- Kratzer J, Leenders TAJ, van Engelen JML. 2006. Team polarity and creative performance in innovation teams. *Crea. Innov. Manag.* 15:96–104
- Kurtzberg TR, Amabile TM. 2001. From Guilford to creative synergy: opening the black box of team-level creativity. *Creat. Res. J.* 13:285–94
- Leifer R, McDermott CM, O'Connor GC, Peters LS, Rice M, Veryzer R. 2000. *Radical Innovation: How Mature Companies Can Outsmart Upstarts*. Boston: HBS Press
- Liu Y, Phillips JS. 2011. Examining the antecedents of knowledge sharing in facilitating team innovativeness from a multilevel perspective. *Intern. J. Inform. Manag.* 31:44–52
- March JG. 1991. Exploration and exploitation in organizational learning. *Org. Sci.* 2:71–87
- Mathisen GO, Martinsen O, Einarsen S. 2008. The relationship between creative personality composition, innovative team climate, and team innovativeness: an input-process-output perspective. *J. Crea. Behav.* 42:13–31
- Miron-Spektor E, Erez M, Naveh E. 2011. The effect of conformist and attention-to-detail members on team innovation. *Acad. Manag. J.* 54:740–60
- Mitchell R, Boyle B. 2015. Professional diversity, identity salience and team innovation: the moderating role of open-mindedness norms. *J. Org. Behav.* 36:873–94
- Mitchell R, Parker V, Giles M, Joce P, Chiang V. 2012. Perceived value congruence and team innovation. *J. Occ. Org. Psych.* 85:626–48
- Nijstad BA, Berger-Sleman F, De Dreu CKW. 2014. Innovation in top management teams: minority dissent, transformational leadership, and radical innovations. *Eur. J. Work Org. Psych.* 23:310–22
- Nsenduluku E, Shee HK. 2009. Organisational and group antecedents of work group service innovativeness. *J. Manag. Org.* 15:438–51
- Obstfeld D. 2005. Social networks, the *Tertius Iungens* orientation, and involvement in innovation. *Adm. Sci. Q.* 50:100–30
- O'Neill TA, Allen NJ, Hstings SE. 2013. Examining the “pros” and “cons” of team conflict: a team-level meta-analysis of task, relationship, and process conflict. *Hum. Perf.* 26:236–60
- Paulsen N, Callan VJ, Ayoko O, Saunders D. 2013. Transformational leadership and innovation in an R&D organization experiencing major change. *J. Org. Change Manag.* 26:595–610
- Paulsen N, Maldonado D, Callan VJ, Ayoko O. 2009. Charismatic leadership, change and innovation in an R&D organization. *J. Org. Change Manag.* 22:511–23
- Pearce CL, Ensley MD. 2004. A reciprocal and longitudinal investigation of the innovation process: the central role of shared vision in product and process innovation teams (PPITs). *J. Org. Behav.* 25:259–78
- Peltokorpi V, Hasu M. 2014. How participative safety matters more in team innovation as team size increases. *J. Bus Psych.* 29:37–45
- Perry-Smith JE, Shalley CE. 2014. A social composition view of team creativity: the role of member nationality-heterogeneous ties outside of the team. *Org. Sci.* 25:1434–52
- Pirola-Merlo A. 2010. Agile innovation: the role of team climate in rapid research and development. *J. Occ. Org. Psych.* 83:1075–84
- Pirola-Merlo A, Mann L. 2004. The relationship between individual creativity and team creativity: aggregating across people and time. *J. Org. Behav.* 25:235–57
- Post C. 2012. Deep-level team composition and innovation: the mediating roles of psychological safety and cooperative learning. *Group Org. Manag.* 37:555–88
- Reuveni Y, Vashdi DR. 2015. Innovation in multidisciplinary teams: the moderating role of transformational leadership in the relationship between professional heterogeneity and shared mental models. *Eur. J. Work Org. Psych.* 24:678–92
- Richter A, Hirst G, van Knippenberg D, Baer M. 2012. Creative self-efficacy and individual creativity in teams: cross-level interactions with team informational resources. *J. Appl. Psych.* 97:1282–90
- Rietzschel EF. 2011. Collective regulatory focus predicts specific aspects of team innovation. *Group Proc. Intergr. Rel.* 14:337–45
- Rousseau V, Aube C, Tremblay S. 2013. Team coaching and innovation in work teams: an examination of the motivational and behavioral intervening mechanisms. *Lead. Org. Dev. J.* 34:344–64

- Salas E, Fiore SM. 2004. *Team Cognition: Understanding the Factors that Drive Process and Performance*. Washington, DC: APA
- Schilpzand MC, Herold DM, Shalley CE. 2011. Members' openness to experience and teams' creative performance. *Small Group Res.* 42:55–76
- Schippers MC, West MA, Dawson JF. 2015. Team reflexivity and team innovation: the moderating role of team context. *J. Manag.* 41:769–88
- Schneider B, Reichers AE. 1983. On the etiology of climates. *Pers. Psych.* 36:19–39
- Shin SJ, Zhou J. 2007. When is educational specialization heterogeneity related to creativity in research and development teams? Transformational leadership as a moderator. *J. Appl. Psych.* 92:1709–21
- Shin Y, Eom C. 2014. Team proactivity as a linking mechanism between team creative efficacy, transformational leadership, and risk-taking norms and team creative performance. *J. Crea. Behav.* 48:89–114
- Somech A. 2006. The effects of leadership style and team process on performance and innovation in functionally heterogeneous teams. *J. Manag.* 32:132–57
- Somech A, Drach-Zahavy A. 2007. Schools as team-based organizations: a structure-process-outcomes approach. *Group Dynam.* 11:305–20
- Somech A, Drach-Zahavy A. 2013. Translating team creativity to innovation implementation: the role of team composition and climate for innovation. *J. Manag.* 39:684–708
- Somech A, Khalaili A. 2014. Team boundary activity: its mediating role in the relationship between structural conditions and team innovation. *Group Org. Manag.* 39:274–99
- Sung SY, Choi JN. 2012. Effects of team knowledge management on the creativity and financial performance of organizational teams. *Org. Behav. Hum. Dec. Proc.* 118:4–13
- Taggar S. 2001. Group composition, creative synergy, and group performance. *J. Crea. Behav.* 35:261–86
- Taggar S. 2002. Individual creativity and group ability to utilize individual creative resources: a multilevel model. *Acad. Manag. J.* 45:315–30
- Tjosvold D, Tang MML, West M. 2004. Reflexivity for team innovation in China: the contribution of goal interdependence. *Group Org. Manag.* 29:540–59
- Tjosvold D, Yu ZY, Wu P. 2009. Empowering individuals for team innovation in China: conflict management and problem solving. *Negot. Conf. Manag. Res.* 2:185–206
- Triandis HC, Bass AR, Ewen RB, Mikesell EH. Team creativity as a function of the creativity of the members. 1963. *J. Appl. Psych.* 47:104–10
- Tsai WC, Chi NW, Grandey AA, Fung SC. 2012. Positive group affective tone and team creativity: negative group affective tone and team trust as boundary conditions. *J. Org. Behav.* 33:638–56
- Tzabbar D, Vestal A. 2015. Bridging the social chasm in geographically distributed R&D teams: the moderating effects of relational strength and status asymmetry on the novelty of team innovation. *Org. Sci.* 26:811–29
- van Dijk H, van Engen ML, van Knippenberg D. 2012. Defying conventional wisdom: a meta-analytical examination of the differences between demographic and job-related diversity relationships with performance. *Org. Behav. Hum. Dec. Proc.* 119:38–53
- van Ginkel WP, van Knippenberg D. 2008. Group information elaboration and group decision making: the role of shared task representations. *Org. Behav. Hum. Dec. Proc.* 105:82–97
- van Knippenberg D, De Dreu CKW, Homan AC. 2004. Work group diversity and group performance: an integrative model and research agenda. *J. Appl. Psych.* 89:1008–22
- van Knippenberg D, Mell JN. 2016. Past, present, and potential future of team diversity research: from compositional diversity to emergent diversity. *Org. Behav. Hum. Dec. Proc.* 136:135–45
- van Knippenberg D, Schippers MC. 2007. Work group diversity. *Annu. Rev. Psych.* 58:515–41
- van Knippenberg D, Sitkin SB. 2013. A critical assessment of charismatic-transformational leadership research: Back to the drawing board? *Acad. Manag. Ann.* 7:1–60
- van Knippenberg D, van Ginkel WP, Homan AC. 2013. Diversity mindsets and the performance of diverse teams. *Org. Behav. Hum. Dec. Proc.* 121:183–93
- Walter F, van der Vegt GS. 2013. Harnessing members' positive mood for team-directed learning behaviour and team innovation: the moderating role of perceived team feedback. *Eur. J. Work Org. Psych.* 22:235–48
- Wang P, Zhu W. 2011. Mediating role of creative identity in the influence of transformational leadership on creativity: Is there a multilevel effect? *J. Lead. Org. Stud.* 18:25–39

- Wei LQ, Lau CM. 2012. Effective teamwork at the top: the evidence from China. *Int. J. Hum. Res. Manag.* 23:1853–70
- Weingart LR, Todorova G, Cronin MA. 2010. Task conflict, problem-solving, and yielding: effects on cognition and performance in functionally diverse innovation teams. *Negot. Conf. Manag. Res.* 3:312–37
- West MA. 1990. The social psychology of innovation in groups. See West & Farr 1990, pp. 4–36
- West MA. 2002a. Ideas are ten a penny: It's team implementation not idea generation that counts. *Appl. Psych.* 51:411–24
- West MA. 2002b. Sparkling fountains or stagnant ponds: an integrative model of creativity and innovation implementation in work groups. *Appl. Psych.* 51:355–424
- West MA, Anderson NR. 1996. Innovation in top management teams. *J. Appl. Psych.* 81:680–93
- West MA, Borrill CS, Dawson JF, Brodbeck F, Shapiro DA, Haward B. 2003. Leadership clarity and team innovation in health care. *Lead. Q.* 14:393–410
- West MA, Farr JL. 1990. *Innovation and Creativity at Work: Psychological and Organizational Strategies*. Chichester, UK: Wiley
- Wong A, Tjosvold D, Liu C. 2009. Innovation by teams in Shanghai, China: cooperative goals for group confidence and persistence. *Brit. J. Manag.* 20:238–51
- Xie XY, Wang WL, Luan K. 2014. It is not what we have, but how we use it: re-exploring the relationship between task conflict and team innovation from the resource-based view. *Group Proc. Intergr. Rel.* 17:240–51
- Yoshida DT, Sendjaya S, Hirst G, Cooper B. 2014. Does servant leadership foster creativity and innovation? A multi-level mediation study of identification and prototypicality. *J. Bus. Res.* 67:1395–404
- Zacher H, Rosing K. 2015. Ambidextrous leadership and team innovation. *Lead. Org. Dev. J.* 36:54–68
- Zhou J, Hoever IJ. 2014. Research on workplace creativity: a review and redirection. *Annu. Rev. Organ. Psych. Organ. Behav.* 1:333–59
- Zhou J, Shin SJ, Brass DJ, Choi J, Zhang ZX. 2009. Social networks, personal values, and creativity: evidence for curvilinear and interaction effects. *J. Appl. Psych.* 94:1544–52



# Contents

Perspective Construction in Organizational Behavior <i>Karl E. Weick</i> .....	1
Self-Determination Theory in Work Organizations: The State of a Science <i>Edward L. Deci, Anja H. Olafsen, and Richard M. Ryan</i> .....	19
A Road Well Traveled: The Past, Present, and Future Journey of Strategic Human Resource Management <i>Patrick M. Wright and Michael D. Ulrich</i> .....	45
Emotions in the Workplace <i>Neal M. Ashkanasy and Alana D. Dorris</i> .....	67
Field Experiments in Organizations <i>Dov Eden</i> .....	91
Abusive Supervision <i>Bennett J. Tepper, Lauren Simon, and Hee Man Park</i> .....	123
Recruitment and Retention Across Cultures <i>David G. Allen and James M. Vardaman</i> .....	153
Multilevel Modeling: Research-Based Lessons for Substantive Researchers <i>Vicente González-Romá and Ana Hernández</i> .....	183
Team Innovation <i>Daan van Knippenberg</i> .....	211
Evidence-Based Management: Foundations, Development, Controversies and Future <i>Sara L. Rynes and Jean M. Bartunek</i> .....	235
Transition Processes: A Review and Synthesis Integrating Methods and Theory <i>Paul D. Bliese, Amy B. Adler, and Patrick J. Flynn</i> .....	263

Trust Repair <i>Roy J. Lewicki and Chad Brinsfield</i> .....	287
Comparing and Contrasting Workplace Ostracism and Incivility <i>D. Lance Ferris, Meng Chen, and Sandy Lim</i> .....	315
Psychological Capital: An Evidence-Based Positive Approach <i>Fred Luthans and Carolyn M. Youssef-Morgan</i> .....	339
Construal Level Theory in Organizational Research <i>Batia M. Wiesenfeld, Jean-Nicolas Reyt, Joel Brockner, and Yaacov Trope</i> .....	367
Dynamic Self-Regulation and Multiple-Goal Pursuit <i>Andrew Neal, Timothy Ballard, and Jeffrey B. Vancouver</i> .....	401
Neuroscience in Organizational Behavior <i>David A. Waldman, M.K. Ward, and William J. Becker</i> .....	425
Retaking Employment Tests: What We Know and What We Still Need to Know <i>Chad H. Van Iddekinge and John D. Arnold</i> .....	445
Alternative Work Arrangements: Two Images of the New World of Work <i>Gretchen M. Spreitzer, Lindsey Cameron, and Lyndon Garrett</i> .....	473
Communication in Organizations <i>Joann Keyton</i> .....	501
Collective Turnover <i>John P. Hausknecht</i> .....	527

## Errata

An online log of corrections to *Annual Review of Organizational Psychology and Organizational Behavior* articles may be found at <http://www.annualreviews.org/errata/orgpsych>