1. Conducting rigorous research on individual creativity

Christina E. Shalley and Amy P. Breidenthal

Individual creativity, or the generation of novel and useful ideas by individuals at work (Amabile, 1996; Oldham & Cummings, 1996; Shalley, 1991), is often seen as the fundamental building block of organizational innovation (Anderson et al., 2014; Liu et al., 2017). Innovation, in turn, is increasingly cited as paramount for organizations to achieve a sustainable competitive advantage (Amabile, 1996; Lee & Hsieh, 2010; Lengnick-Hall, 1992; Thornhill, 2006). Hence, over the past few decades, research on individual creativity has flourished within the organizational behavior literature (Anderson et al., 2014; Shalley et al., 2004). While this research undoubtedly provides great insights overall, scholars' ability to accurately interpret and aggregate these findings relies heavily on the way creativity is operationalized and measured across studies (Barbot et al., 2019; Batey, 2012; Hinkin, 1998). Therefore, the purpose of this chapter is to review the measurement of individual creativity in organizational studies and highlight some meaningful issues that need to be addressed in order to conduct rigorous research on individual creativity.

In order to conduct this review, we looked broadly at creativity research in the management domain with a particular focus on meta-analyses, reviews, and seminal articles. In addition, we took a closer look at the research published within the last five years by conducting an in-depth review of empirical articles on individual creativity that were published in a sample of top management journals¹ from January 2014 through June 2019. We restricted our scope to empirical investigations of individual-level creativity.² As this review will show, in general, creativity scholars have reached consensus around an overall definition of creativity and common measurement approaches for both experimental and field studies. We begin with a brief overview of these points of consensus and look to relevant recent research to highlight the most common approaches for studying creativity. However, this same research has also highlighted several points of discrepancy or areas in which there are debates over the conceptualization of creativity. Such points of active debate include how the elements of novelty and usefulness interact; who should rate one's creativity; whether creativity refers to a person, a process, or a product; and how to differentiate creativity from individual innovation. Through the lens of creativity measurement, we investigate the natural assumptions that the common methods of measurement are making regarding these debates. Finally, we highlight new trends in the creativity literature that seek to measure creativity in novel ways.

COMMON MEASURES OF INDIVIDUAL CREATIVITY

Our focus is on the management literature, and we begin by highlighting the conceptual definition of the construct of creativity as the foundation for construct measurement (Eysenck, 1996; Hinkin, 1998). Creativity is often defined as having two elements: the first relating to the novelty, originality, or uniqueness of an idea or outcome; and the second relating to the idea or outcome's perceived usefulness, appropriateness, or value (Amabile, 1983; Shalley, 1991; Woodman et al., 1993). Overwhelmingly, researchers have coalesced around the definition of creativity as the generation of novel and useful ideas (Barbot et al., 2019; Batey, 2012). Nearly every article published in top management journals over the last five years has used a slight variation of this definition (e.g., González-Gómez & Richter, 2015; Li et al., 2017; Seibert et al., 2017). What is interesting is that some of the older work on creativity defined it as an idea or product that is both original and appropriate (Barron, 1955; Stein, 1974), while Amabile (1983) said that "a product or response will be judged as creative to the extent that (a) it is both novel and appropriate, useful, correct, or valuable to the task at hand, and (b) the task is heuristic rather than algorithmic." Heuristic, as opposed to algorithmic, tasks do not have clear and readily identifiable paths to a solution. Although some people still use this definition, of novel and appropriate, more researchers seem to use novelty and usefulness as the definition. We think it could be said that Amabile (1983) seems to view usefulness and appropriateness as interchangeable terms.

From our review of the creativity studies published in the last five years, the empirical methods used for studying creativity in the management literature are, in the order of frequency, field studies, experiments, and archival studies. Field studies that take place within an organization are predominantly conducted outside the United States (for example, in China: Hirst et al., 2015; Hon et al., 2014; Kwan et al., 2018; in Denmark: Soda et al., 2019; and in Columbia: González-Gómez & Richter, 2015). Across all field studies, creativity is primarily measured through surveys, and employees' creativity is assessed most often by the employees' supervisor. In some cases, creativity assessments are completed by one or more co-workers (e.g., Harris et al., 2014), or the employees are asked to self-rate their own creativity (e.g., Kaupila et al., 2018; Rosen et al., 2014).

There also appears to be a great deal of consensus concerning the top scales used for measuring employee creativity. In our five-year review, the 13-item measure introduced both in Zhou and George (2001) and in George and Zhou (2001)³ was by far the most frequently utilized; 18 of the 32 studies that used a scale to measure creativity utilized this 13-item scale or a subset of these items. All other scales were reported across only 1–3 studies each. Among these, the scales that were cited more than once were the three- or four-item scales introduced by Oldham and Cummings (1996), Tierney et al. (1999) and Farmer et al. (2003). This finding parallels the finding of a 2011 meta-analysis on creativity and individual innovation (Hammond et al., 2011) which reported that the following creativity scales were the most frequently cited: Tierney et al. (1999), Zhou and George (2001), and Oldham and Cummings

(1996). Anderson et al.'s (2014) review of the creativity and individual innovation literature also cited these three scales as the most commonly used, with Zhou and George (2001) as the most frequently cited.

In the management literature, experimental investigations of individual creativity also share strong commonalities across studies. The majority of these studies ask subjects to complete a complex heuristic task during which they produce one or more ideas, solutions, or products. Then a version of Amabile's (1982) consensual assessment technique (CAT) is used, wherein multiple judges conduct a blind review of the documented ideas, solutions, or products and either rate their overall level of creativity, or they rate the novelty and usefulness of the ideas, solutions, or products separately. In the latter case, the scores are then aggregated in order to compose an individual's creativity score from each rater. For both approaches, if agreement is strong enough between the multiple raters, creativity scores provided by the different raters are aggregated to form the participant's overall creativity score. Less common, but occasionally done in management research, is when participants are asked to engage in a creative thinking task such as a remote association thinking task, a divergent thinking task, or the Dunker candle problem (Dunker, 1945). Participants for the experimental studies that were contained in our five-year review were most often recruited either through panels such as Amazon's Mechanical Turk or Qualtrics (Huang et al., 2015; Jung & Lee, 2015) or by using college students (Brown & Baer, 2015; Perry-Smith, 2014). The experimental studies found in our five-year study were predominantly conducted in the United States.

The tasks given to subjects for creative idea generation vary between studies, but some common themes can be seen across studies such as solving organizational problems or creating new marketing campaigns and products. Shalley (1991) introduced a memo task that has the participants assume the role of a human resources (HR) manager who is tasked to deal with multiple management problems (Perry-Smith, 2014). Madjar et al. (2019) asked participants to develop a creative solution for a newspaper that was faced with a number of strategic challenges. Goncalo et al. (2015) used a task that asked subjects to generate ideas for a new business to fill a vacant space on campus. Madjar and Oldham (2006) presented multiple tasks including creation of a new marketing campaign and generation of new models for a refrigerator (Madjar & Shalley, 2008). Chua (2018) asked subjects to generate a marketing campaign for a new flavored water product.

Archival studies are much less common in management studies of creativity (Hülshager et al., 2009), however, scholars are increasingly looking for opportunities to utilize objective measures of creativity (Liao et al., 2010). In such cases, archival measures of creativity may include citations (e.g., Arts & Fleming, 2018) or invention disclosures and research reports (Tierney et al., 1999). Additionally, recent archival studies have tested hypotheses using public information in creative fields such as movies and television (Clement et al., 2018; Mannucci & Yong, 2017). In these examples, creativity was assessed by viewership ratings and box office success.

Across all study types, but especially in field studies, scholars vary regarding which variables they measured and controlled for in statistical analyses. The most

common controls included demographic and role variables and creativity-related personality variables or self-beliefs. For example, gender, age, education, and organizational tenure are the most commonly utilized control variables across all studies. Interestingly, none of these variables significantly correlated with creativity in the majority of the studies conducted over the last five years (although each does in certain instances). Openness to experience (Costa & McCrae, 1992) and creative self-efficacy (Tierney & Farmer, 2002) were also included in multiple studies as control variables, and were typically, but not always, significantly correlated with creativity.

ONGOING DEBATES ON CONDUCTING RIGOROUS RESEARCH ON INDIVIDUAL CREATIVITY

While the above summary shows that creativity researchers operate with a great deal of consistency across organizational studies, this is not to say that there are no debates among scholars regarding how to conduct rigorous research on individual creativity. Among the top questions to be resolved are the following: (1) How do novelty and usefulness work together to define creativity (Berg, 2014; Miron-Spektor & Beenen, 2015; Sullivan & Ford, 2010)? (2) Who is the best person to assess an individual's creativity (Ng & Feldman, 2012)? (3) Does creativity refer to a person, process, or product (Montag et al., 2012)? and (4) Where is the line differentiating creativity from individual innovation (Anderson et al., 2014)? In order to contribute to these conversations, we next review how creativity has been measured in the recent management literature.

Creativity: How do Novelty and Usefulness Work Together?

As noted above, the common definition of creativity is the generation of novel and useful ideas. While this appears straightforward initially, it is essentially a double-barreled definition and therefore researchers, to date, have interpreted this definition in a few different ways both in theory and in measurement. Theoretically, as noted above, the most common definition of creativity gives equal weight to both elements, essentially suggesting that increases (decreases) in either novelty or usefulness would increase (decrease) one's overall creativity. However, some variations in this conceptualization suggest that novelty is the primary indicator of creativity, while usefulness plays a secondary role (Diedrich et al., 2015). For example, previous work also has considered creativity as "a novel work that is accepted as tenable or useful" (Stein, 1953: 311), or similarly, "new or original ideas ... which are accepted by experts as being of scientific, aesthetic, social, or technological value" (Vernon, 1989: 94). Therefore, we will next summarize how the elements of novelty and usefulness have been measured in recent creativity studies in the management domain to highlight how this theoretical debate is impacting the measurement of creativity, and what measurement has to say for the theoretical debate.

In our review of the recent literature, a few scholars defined creativity as the generation of “novel and potentially useful” ideas (Harris et al., 2014; Soda et al., 2019). Yet, interestingly, these articles do not measure creativity any differently than those that omit the term “potentially,” and this applies to both experimental and field studies. In experimental studies, as noted above, the CAT is typically applied in which subjects are asked to generate ideas and raters assess the creativity of these ideas. In such studies, some researchers instruct the judges to rate idea novelty separately from idea usefulness, and then aggregate the two utilizing a product function (for example, product: Brown & Baer, 2015; or square root of the product: Perry-Smith, 2014). Similarly, scholars have asked raters to assess ideas on up to four dimensions assessing both novelty and usefulness and averaging the scores (for example, novelty, originality, usefulness, and feasibility; Zhou et al., 2017). Other researchers, however, asked the raters to assess overall creativity (Madjar et al., 2019) or combined overall creativity, novelty, and usefulness into a composite measure (Koseoglu et al., 2017b). While some report that the definition of “novel and useful” was provided to the rater (Jung & Lee, 2015), others do not specify what, if any, direction was provided to the raters. In these cases, the rater may be utilizing their own lay definition of creativity to assess the creativity of the ideas presented. Notably, in one study, raters were asked to assess the extent to which the presented ideas were novel, unique, unconventional, and creative (Chua, 2018). In this study, usefulness or feasibility was not included in the measure of creativity, yet creativity was defined as “the creation of a new product or idea that satisfies some value functions,” thereby putting the element of novelty as dominant over the element of usefulness or value.

In field studies, some common scales similarly assess the creativity of an individual’s output. Unlike the CAT, none of the scales we identified assess usefulness or practicality as a unique element. Instead, commonly used scales either merge the elements of novelty and usefulness into individual items (Oldham & Cummings, 1996), or assess creativity, novelty, and originality without highlighting the usefulness element (Shalley et al., 2009). In the most common measure of creativity (Zhou & George, 2001), four items assess novelty alone (that is, is a good source of creative ideas, exhibits creativity on the job when given the opportunity to, comes up with creative solutions to problems, and often has new and innovative ideas), while five items assess one’s creativity applied in a useful or practical domain (for example, suggests new ways to achieve goals or objectives, and suggests new ways to increase quality).⁴

Hence, in field studies, the measurement of creativity generally emphasizes novelty over usefulness and assesses one’s novelty applied in a useful or appropriate domain. However, in archival studies, where creativity is often measured by evaluating the success of any outcomes (for example, patents, ratings, and box office success), it is possible that the usefulness element of creativity is more heavily weighted, although the measure is not as clearly distinguished between these two elements. Overall, from looking at the measurement of creativity in the management literature, it appears that the interpretation of creativity as novelty that has the potential to be useful, or novelty

that is applied in an appropriate way, is more aligned to the way creativity is assessed, especially in the most commonly conducted type of study: that of field studies. This approach is further supported by studies that investigate novelty and usefulness separately, which we discuss below.

Creativity: Who is the Best Person to Assess it?

More elaborate definitions of creativity take into account the inherently subjective nature of the assessment of novelty and usefulness. For example, Ford defines creativity as the “domain-specific, subjective judgment of the novelty and value of an outcome of a particular action” (Ford, 1996: 1115). In other words, creativity is subjective, and when an idea is considered creative in the domain in which it was introduced, it may not be very novel in other domains. Hence, the person subjectively assessing an individual’s or idea’s creativity may substantively impact the rating of creativity assigned. Furthermore, research is starting to uncover that rater characteristics and environmental characteristics may impact how individuals perceive creativity (Zhou et al., 2019). Hence, special attention should be paid in creativity studies to who is rating creativity.

In experimental studies published in our sample of top management journals over the last five years, the CAT raters were a mix of creativity experts (e.g., Černe et al., 2014), experienced managers (e.g., Jung & Lee, 2015), and independent coders (e.g., Brown & Baer, 2015). Regarding field studies that utilized survey measures for employee creativity ratings, 26 studies asked supervisors to rate employee creativity (e.g., Hirst et al., 2015; Kwan et al., 2018; Parke et al., 2015), compared to only four studies that used self-reports (e.g., Harrison & Wagner, 2016; Rosen et al., 2014), and two that used multiple co-worker reports (Harris et al., 2014; Marinova et al., 2019). In addition, one study that focused on the leader’s level of creativity asked a number of their subordinates to rate their leader’s creativity, and then using a modified version of CAT aggregated these ratings to form one creativity score for each leader (Koseoglu et al., 2017a). The preponderance of supervisors serving as the most likely rater of employee creativity aligns with recent reviews of the creativity literature (e.g., Anderson et al., 2014), and this trend may help to reduce concerns about common method bias (Podsakoff et al., 2003). However, it is possible that it opens up individual creativity ratings to other types of bias such as liking and any other halo effects (Liao et al., 2010). Hence, some researchers have pursued more objective ratings of creativity. However, objective ratings of creativity are harder to define, as they can span a wide range of measures. For example, creativity measures coined “objective” can include measures ranging from citations (Seibert et al., 2017) to bonuses awarded by top leaderships’ review of ideas (Liu et al., 2015), to using an “objective count” of the number of correct answers provided on an associative thinking task (Jung & Lee, 2015). Putting all of this together with burgeoning research regarding the myriad of influences that can affect one’s judgments of another’s creativity (Kay et al., 2018; Mueller et al., 2018; Randel et al., 2011; Zhou et al., 2019)

highlights how utilizing different raters of creativity may substantially impact exactly what one is assessing.

Creativity: Is it a Person, Process, or Product?

An issue that has been repeatedly highlighted in the broader psychology literature is the use of the single term “creativity” to refer to creativity as a person (that is, creativity-related individual differences), a process (that is, cognitive processes used to generate novel and useful ideas), a product (that is, novel and useful outcomes), and “press” (that is, environmental influences, creativity climate) (Barbot et al., 2019; Batey, 2012; Rhodes, 1961). In our review of the recent management literature, a similar issue exists, however, with some variation. For example, the “press” or environmental factors appear to be better distinguished from “individual creativity” within the management literature. Factors such as having a climate for creativity (Amabile et al., 1996) and a creative team environment (González-Gómez & Richter, 2015) are investigated as predictors of individual creativity or seen as boundary conditions. In our review, we did not find any instances of environmental factors being referred to as “creativity.” However, in the management literature, the term “creativity” is used in theoretical models to represent creativity as a person, process, and product.

Several constructs at the “person” level have been differentiated from creativity and studied in their own right. For example, creative self-efficacy (Tierney & Farmer, 2002; Zhang & Zhou, 2014), creative identity (Farmer et al., 2003; Vincent & Kouchaki, 2015), and dispositional creativity (Gough, 1979; Keem et al., 2018) have been investigated uniquely from creative processes or outcomes. Yet, there is still some debate at the “person” level when it comes to creativity-related skills. Theoretically, these have been identified as predictors of individual creativity (Amabile, 1996), and at times classified as creativity traits (Eysenck, 1996). Yet in our review of creativity studies in management journals over the last five years we identified multiple studies that assessed individual creativity through creative-thinking tasks, such as divergent thinking tasks and remote association thinking tasks (Huang et al., 2015; Jung & Lee, 2015; Lu et al., 2017). Hence, according to the measurement of creativity, there is still some discrepancy regarding whether creative-thinking tasks represent creative potential or actual creativity. However, overall, creative traits do seem to be well distinguished from the actual generation of novel and useful ideas in organizational research.

In the management literature, the most significant open question is regarding how to distinguish between creativity as a process and creativity as a product. Theoretically, scholars have often articulated the distinction between the two (Amabile, 1983; Woodman et al., 1993). For example, Montag et al. (2012) defined creative behaviors (that is, process) as ranging from behaviors such as problem construction to idea evaluation, and distinguished these from creative outcome effectiveness (that is, product) that they define as the “joint novelty and usefulness (that is, quality) of a product or service or of an outcome as judged by relevant stakeholders”

(Montag et al., 2012: 1369). While theoretically distinct, studies of creativity in the management literature may be theoretically investigating the creative process, the creative product, or a mix of the two. The measures of creativity also may focus on one, the other, or both. Interestingly, in our review, it appears that the two are not always aligned.

Some measures have been generated that clearly assess the creative process. For example, creative process engagement is a construct that was introduced by Zhang and Bartol (2010). This measure is often used in field studies and tends to be self-reported, assessing the frequency with which one engages in problem identification, information searching and encoding, and idea generation behaviors. Meanwhile, other measures more clearly assess the evaluation of the novelty and usefulness of an idea or product that has been produced, presumably from engaging in some type of creative process. Archival studies look at evidence of creative outcomes such as citations (Arts & Fleming, 2018) and an audience's reception to television shows and movies (Clement et al., 2018; Mannucci & Yong, 2017). Some field survey measures such as the three-item measure from Oldham and Cummings (1996) ask one's supervisor to assess one's creative outcomes at work. An example of an item from this scale asks supervisors about their employees: "How original and practical is this person's work? Original and practical work refers to developing ideas, methods, or products that are both totally unique and especially useful to the organization" (Oldham & Cummings, 1996). Additionally, some scholars are moving away from using the general term "creativity" and instead hypothesizing about the specific elements of creativity that they are measuring, such as the number of publications or citations (Seibert et al., 2017), idea quantity and quality (Kier & McMullen, 2018), and creative responses (Perry-Smith, 2014). However, many other measures of creativity are not as clearly aligned to either a process or a product.

The CAT used in experimental studies asks judges who are blind to the experimental manipulations to assess the overall creativity of the ideas or products produced. On one hand, this can be considered an assessment of the creative product, in that expert judges are assessing the novelty and usefulness of one's creative outputs. However, some scholars have argued that this is also an assessment of idea generation, which is one step in the creative process (Montag et al., 2012). Looking at the most commonly used measure in field studies (Zhou & George, 2001), this scale includes behavioral items such as "searches out new technologies, processes, techniques, and/or product ideas" and outcome items such as "often has new and innovative ideas." Similarly, Farmer et al.'s (2003) scale includes both searching behaviors (that is, "seeks new ideas and ways to solve problems") and novel outcomes (that is, "generates ground-breaking ideas related to the field") within their four-item creativity scale.

Drawing on the distinction between studies of the creative process that could lead to creative outcomes is additionally confusing because of the broader meaning and use of the terms "behaviors" and "outcomes." The term "behavior" relates to any observable variable, as opposed to attitudes and cognitions. Therefore, we discuss job performance as being a behavior even though we may be assessing behaviors in one's job or the outcome of one's behaviors such as the quantity or quality of output.

Scholars also use the term “outcome” to refer to any dependent variable in a predictive model. So even in articles that highlight creativity as an outcome (that is, the thing being predicted), the aspect of creativity under investigation may be creative behavior or engaging in the creative process (for example, Rosen et al., 2014). Hence teasing apart the research predicting creative behaviors from creative outcomes can be even more complicated when the terminology used in the hypotheses is the same (that is, creativity) and the measures are not clearly distinguished.

Creativity: How to Distinguish it from Individual Innovation?

A similar area of conceptual overlap, both theoretically and empirically, lies in the distinction between creativity and innovation at the individual level. To creativity scholars, these constructs are considered separately since they represent the beginning and ending phases of implementing a new idea or solution in an organization (Amabile, 1996; Anderson et al., 2014). Creativity is the first step: from problem identification to idea generation or, at times, idea evaluation, selection, and development within an individual or group generating the idea. Innovation at the individual level begins with communicating and championing an idea out in the larger organization and ends at the implementation of the new idea (Anderson et al., 2014). However, this distinction is not universally agreed upon in the management literature. To individual innovation scholars, individual innovation is often conceptualized as the entire process including idea generation (Hammond et al., 2011; Scott & Bruce, 1994; Yuan & Woodman, 2010).

Research on individual innovation often uses Scott and Bruce’s (1994) six-item scale that assesses an employee’s creative behaviors (for example, information searching, idea generation) and implementation-related behaviors (for example, promoting ideas, securing funds to implement ideas, and planning implementation schedules). Interestingly, there is overlap between this scale and the most commonly used scale to assess individual creativity. Zhou and George (2001) noted that they adapted three items from the Scott and Bruce (1994) scale, two of which are distinctly within the domain of innovation (“promotes and champions ideas to others” and “develops adequate plans and schedules for the implementation of new ideas”). The other shared item, “searches out new technologies, processes, techniques, and/or product ideas” overlaps with the information searching behaviors characteristic of many creative process models (Zhang & Bartol, 2010). While the idea-championing and implementation focused items are only two of the 13 total items in this creativity scale, this does blur the line between creativity and innovation empirically, even in research that often holds a theoretical distinction between creativity and innovation as the point between idea generation and idea championing. Additionally, archival studies that look at the success of implemented ideas that are considered to be creative are at times measured as creativity (Clement et al., 2018; Mannucci & Yong, 2017; Tierney et al., 1999), and inherently include the implementation phase within the definition of creativity. It is also worth noting that a large number of creativity meta-analyses conducted in the last few decades have included both creativity and

innovation in the literature review search terms (Byron & Khazanchi, 2012; Byron et al., 2010; Davis, 2009); meta-analyses of individual innovation include creativity in search terms (Hammond et al., 2011); and recent reviews of creativity incorporate the two into a definition statement (Anderson et al., 2014).

NEW TRENDS IN CREATIVITY MEASUREMENT

Two of the biggest trends in recent research relate directly to the concerns highlighted above: first, the investigation of novelty and usefulness as separate, unique constructs; and second, research on how people judge or perceive ideas to be more or less creative. A related third trend is in exploring cultural differences in the experience of and understanding of creativity. Given our findings about the same scales being used and the unidimensional definition of creativity that exists in research across the globe, finding that different cultures might interpret the phrases “creative” and “novel” uniquely could bring important guidance to the interpretation and aggregation of such studies.

As noted above, ratings of originality or novelty have been shown to have an inverse relationship, at times, with ratings of usefulness or the appropriateness of an idea (Ford & Gioia, 2000; Runco & Charles, 1993). Hence, researchers have recently brought an increased focus to the direct investigation of novelty and usefulness as independent constructs, especially investigating which constructs impact novelty versus which constructs impact usefulness (Berg, 2014; Ford & Gioia, 2000). Many of these studies utilize an experimental research design and CAT rating, rating the usefulness and novelty of the ideas separately, but not aggregating them in the end (Berg, 2014; Miron-Spektor & Beenen, 2015).

Notably, some of these studies have investigated the unique contribution that each aspect of creativity (novelty and usefulness) makes to the overall assessment of creativity. Findings suggest that novelty assessments play a greater role in creativity assessments than usefulness (Diedrich et al., 2015; Runco & Charles, 1993). These studies also find interactive effects, but the interaction results are less consistent across studies. Further research in this vein can provide refined guidance to the issue stated above: confirming how we should incorporate these two elements of the definition of creativity into our measurement of creativity in both field and experimental settings.

Another trend in measuring creativity is in explicitly investigating the way individuals make assessments of creativity (e.g., Mueller et al., 2018; Randel et al., 2011; Zhou et al., 2017). A recent review coins this research as the receiving side of creativity (Zhou et al., 2019). This research highlights that there are characteristics of the context, the creator, the evaluator, and the creative object that impact one’s assessment of an object’s creativity (Zhou et al., 2019). Given that most measures of creativity involve one or more raters (for example, expert raters, supervisors, co-workers) assessing the novelty and usefulness of an output, much of this research may be conflating influences on objective creativity with influences on one’s per-

ceptions of creativity. We echo the call from the researchers for future work to study the “generative and evaluative processes [of creativity] in combination, rather than independently” (Zhou et al., 2019: 2590). The struggle still remains, however, to define a truly “objective” measure of creative idea generation.

Finally, while the idea that different cultures experience and view creativity differently is not old, the creativity literature to date has not incorporated these potential differences into the measurement of creativity (Glaveanu, 2019). As shown in the above review, the research methods and scales used to assess creativity are quite consistent across studies. For example, Zhou and George’s (2001) 13-item scale is used in studies in Slovenia (Černe et al., 2014), Columbia (González-Gómez & Richter, 2015), Denmark (Soda et al., 2019), China (Zhang et al., 2014), and the United States (Parke et al., 2015), to name a few. Research conducted on cultural influences on creativity assessments typically investigate the differences between the East (for example, China) and the West (for example, the United States). These studies continually report that while individuals, in general, associate creativity with originality and imagination (Glaveanu, 2019; Niu & Kaufman, 2013), Eastern cultures place a greater emphasis on usefulness and social value, while Western cultures place a greater emphasis on novelty and individual originality (Loewenstein & Mueller, 2016; Morris & Leung, 2010; Niu & Kaufman, 2013; Niu & Sternberg, 2002). Hence, when raters or supervisors are responding to survey questions about an employee’s overall creativity, different behaviors and outcomes might drive ratings in each of these contexts. Building on the perspective of the receiving side of creativity mentioned above, these cultural influences on creativity assessments are a critical contextual factor that should be considered in the measurement of creativity and the aggregation and understanding of extant creativity studies.

CONCLUSION

We have reviewed the measurement of individual creativity in organizational studies, and in particular empirical studies that have been published over the last five years in top management journals. Overall, we find that the same unidimensional definition of creativity exists in both experimental and field studies across the world. In addition, the same few scales are used to measure creativity, with one scale (Zhou & George, 2001) predominating in the research. We highlight issues to consider going forward in measuring individual creativity, as well as three recent trends in creativity measurement.

NOTES

1. *Academy of Management Journal, Administrative Science Quarterly, Journal of Applied Psychology, Journal of Management, Management Science, Organization Science,*

Organizational Behavior and Human Decision Processes, Personnel Psychology, and Strategic Management Journal.

2. Search included all articles with the term “creativ*” in the abstract. Initial search returned 116 articles. After removing non-quantitative articles and articles on team- or organizational-level creativity, 57 articles remained.
3. This scale will be referred to as Zhou & George (2001) going forward for parsimony as the items are exactly the same in both references.
4. The remaining four items assess other behaviors such as information search, risk-taking, idea-championing and implementation-planning.

REFERENCES

- Amabile, T.M. 1982. Social psychology of creativity: A consensual assessment technique. *Journal of Personality and Social Psychology*, 43(5): 997–1013.
- Amabile, T.M. 1983. The social psychology of creativity: A componential conceptualization. *Journal of Personality and Social Psychology*, 45(2): 357–376.
- Amabile, T.M. 1996. *Creativity in context: Update to “The Social Psychology of Creativity”*, Vol. 18. Boulder, CO: Westview Press.
- Amabile, T.M., Conti, R., Coon, H., Lazenby, J., & Herron, M. 1996. Assessing the work environment for creativity. *Academy of Management Journal*, 39(5): 1154–1184.
- Anderson, N., Potočník, K., & Zhou, J. 2014. Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, 40(5): 1297–1333.
- Arts, S., & Fleming, L. 2018. Paradise of novelty – or loss of human capital? Exploring new fields and inventive output. *Organization Science*, 29(6): 1074–1092.
- Barbot, B., Hass, R.W., & Reiter-Palmon, R. 2019. Creativity assessment in psychological research: (Re)setting the standards. *Psychology of Aesthetics, Creativity, and the Arts*, 13(2): 233–240.
- Barron, F.X. 1955. The disposition toward originality. *Journal of Abnormal Social Psychology*, 51: 478–485.
- Batey, M. 2012. The measurement of creativity: From definitional consensus to the introduction of a new heuristic framework. *Creativity Research Journal*, 24(1): 55–65.
- Berg, J.M. 2014. The primal mark: How the beginning shapes the end in the development of creative ideas. *Organizational Behavior and Human Decision Processes*, 125(1): 1–17.
- Brown, G., & Baer, M. 2015. Protecting the turf: The effect of territorial marking on others’ creativity. *Journal of Applied Psychology*, 100(6): 1785–1797.
- Byron, K., & Khazanchi, S. 2012. Rewards and creative performance: A meta-analytic test of theoretically derived hypotheses. *Psychological Bulletin*, 138(4): 809–830.
- Byron, K., Khazanchi, S., & Nazarian, D. 2010. The relationship between stressors and creativity: A meta-analysis examining competing theoretical models. *Journal of Applied Psychology*, 95(1): 201–212.
- Chua, R.Y.J. 2018. Innovating at cultural crossroads: How multicultural social networks promote idea flow and creativity. *Journal of Management*, 44(3): 1119–1146.
- Clement, J., Shipilov, A., & Galunic, C. 2018. Brokerage as a public good: The externalities of network hubs for different formal roles in creative organizations. *Administrative Science Quarterly*, 63(2): 251–286.
- Costa, P.T.J., & McCrae, R.R. 1992. *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.

- Černe, M., Nerstad, C.G.L., Dysvik, A., & Škerlavaj, M. 2014. What goes around comes around: Knowledge hiding, perceived motivational climate, and creativity. *Academy of Management Journal*, 57(1): 172–192.
- Davis, M.A. 2009. Understanding the relationship between mood and creativity: A meta-analysis. *Organizational Behavior and Human Decision Processes*, 108(1): 25–38.
- Diedrich, J., Benedek, M., Jauk, E., & Neubauer, A.C. 2015. Are creative ideas novel and useful? *Psychology of Aesthetics, Creativity, and the Arts*, 9(1): 35–40.
- Dunker, K. 1945. On problem-solving. *Psychological Monographs*, 58(5, Whole No. 270).
- Eysenck, H.J. 1996. The measurement of creativity. In M.A. Boden (ed.), *Dimensions of creativity*: 199–242. Cambridge, MA: MIT Press.
- Farmer, S.M., Tierney, P., & Kung-Mcintyre, K. 2003. Employee creativity in Taiwan: An application of role identity theory. *Academy of Management Journal*, 46(5): 618–630.
- Ford, C.M. 1996. A theory of individual creative action in multiple social domains. *Academy of Management Review*, 21(4): 1112–1142.
- Ford, C.M., & Gioia, D.A. 2000. Factors influencing creativity in the domain of managerial decision making. *Journal of Management*, 26(4): 705–732.
- George, J.M., & Zhou, J. 2001. When openness to experience and conscientiousness are related to creative behavior: An interactional approach. *Journal of Applied Psychology*, 86(3): 513–524.
- Glaveanu, V.P. 2019. Measuring creativity across cultures: Epistemological and methodological considerations. *Psychology of Aesthetics, Creativity, and the Arts*, 13(2): 227–232.
- Goncalo, J.A., Chatman, J.A., Duguid, M.M., & Kennedy, J.A. 2015. Creativity from constraint? How the political correctness norm influences creativity in mixed-sex work groups. *Administrative Science Quarterly*, 60(1): 1–30.
- González-Gómez, H.V., & Richter, A.W. 2015. Turning shame into creativity: The importance of exposure to creative team environments. *Organizational Behavior and Human Decision Processes*, 126: 142–161.
- Gough, H.G. 1979. A creative personality scale for the adjective check list. *Journal of Personality and Social Psychology*, 37(8): 1398–1405.
- Hammond, M.M., Neff, N.L., Farr, J.L., Schwall, A.R., & Zhao, X. 2011. Predictors of individual-level innovation at work: A meta-analysis. *Psychology of Aesthetics, Creativity, and the Arts*, 5(1): 90–105.
- Harris, T.B., Li, N., Boswell, W.R., Zhang, X., & Xie, Z. 2014. Getting what's new from newcomers: Empowering leadership, creativity, and adjustment in the socialization context. *Personnel Psychology*, 67(3): 567–604.
- Harrison, S., & Wagner, D.T. 2016. Spilling outside the box: The effects of individuals' creative behaviors at work on time spent with their spouses at home. *Academy of Management Journal*, 59(3): 841–859.
- Hinkin, T.R. 1998. A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods*, 1(1): 104–121.
- Hirst, G., Van Knippenberg, D., Zhou, J., Quintane, E., & Zhu, C. 2015. Heard it through the grapevine: Indirect networks and employee creativity. *Journal of Applied Psychology*, 100(2): 567–574.
- Hon, A.H.Y., Bloom, M., & Crant, J.M. 2014. Overcoming resistance to change and enhancing creative performance. *Journal of Management*, 40(3): 919–941.
- Huang, L., Gino, F., & Galinsky, A.D. 2015. The highest form of intelligence: Sarcasm increases creativity for both expressers and recipients. *Organizational Behavior and Human Decision Processes*, 131: 162–177.
- Hülsheger, U.R., Anderson, N., & Salgado, J.F. 2009. Team-level predictors of innovation at work: A comprehensive meta-analysis spanning three decades of research. *Journal of Applied Psychology*, 94(5): 1128–1145.

- Jung, E.J., & Lee, S. 2015. The combined effects of relationship conflict and the relational self on creativity. *Organizational Behavior and Human Decision Processes*, 130: 44–57.
- Kauppila, O.P., Bizzi, L., & Obstfeld, D. 2018. Connecting and creating: Tertius iungens, individual creativity, and strategic decision processes. *Strategic Management Journal*, 39(3): 697–719.
- Kay, M.B., Proudfoot, D., & Larrick, R.P. 2018. There's no team in I: How observers perceive individual creativity in a team setting. *Journal of Applied Psychology*, 103(4): 432–442.
- Keem, S., Shalley, C.E., Kim, E., & Jeong, I. 2018. Are creative individuals bad apples? A dual pathway model of unethical behavior. *Journal of Applied Psychology*, 103(4): 416–431.
- Kier, A.S., & McMullen, J.S. 2018. Entrepreneurial imaginativeness in new venture ideation. *Academy of Management Journal*, 61(6): 2265–2295.
- Koseoglu, G., Liu, Y., & Shalley, C.E. 2017a. Working with creative leaders: Exploring the relationship between supervisors' and subordinates' creativity. *Leadership Quarterly*, 28(6): 798–811.
- Koseoglu, G., Shalley, C.E., & Herndon, B. 2017b. Task context changes: teams' maladaptive responses to unanticipated change. *Journal of Applied Social Psychology*, 47(4): 195–212.
- Kwan, H.K., Zhang, X., Liu, J., & Lee, C. 2018. Workplace ostracism and employee creativity: An integrative approach incorporating pragmatic and engagement roles. *Journal of Applied Psychology*, 103(12): 1358–1366.
- Lee, J.S., & Hsieh, C.J. 2010. A research in relating entrepreneurship, marketing capability, innovative capability and sustained competitive advantage. *Journal of Business and Economics Research*, 8(9): 109–120.
- Lengnick-Hall, C.A. 1992. Innovation and competitive advantage: What we know and what we need to learn. *Journal of Management*, 18(2): 399–429.
- Li, Y., Li, N., Guo, J., Li, J., & Harris, T.B. 2017. A network view of advice-giving and individual creativity in teams: A brokerage-driven, socially perpetuated phenomenon. *Academy of Management Journal*, 61(6): 2210–2229.
- Liao, H., Liu, D., & Loi, R. 2010. Looking at both sides of the social exchange coin: A social cognitive perspective on the joint effects of relationship quality and differentiation on creativity. *Academy of Management Journal*, 53(5): 1090–1109.
- Liu, D., Gong, Y., Zhou, J., & Huang, J.C. 2017. Human resource systems, employee creativity, and firm innovation: The moderating role of firm ownership. *Academy of Management Journal*, 60(3): 1164–1188.
- Liu, D., Wang, S., & Wayne, S.J. 2015. Is being a good learner enough? An examination of the interplay between learning goal orientation and impression management tactics on creativity. *Personnel Psychology*, 68(1): 109–142.
- Loewenstein, J., & Mueller, J. 2016. Implicit theories of creative ideas: How culture guides creativity assessments. *Academy of Management Discoveries*, 2(4): 320–348.
- Lu, J.G., Hafenbrack, A.C., Eastwick, P.W., Wang, D.J., Maddux, W.W., & Galinsky, A.D. 2017. "Going out" of the box: Close intercultural friendships and romantic relationships spark creativity, workplace innovation, and entrepreneurship. *Journal of Applied Psychology*, 102(7): 1091–1108.
- Madjar, N., & Oldham, G.R. 2006. Task rotation and polychronicity: Effects on individuals' creativity. *Human Performance*, 19(2): 117–131.
- Madjar, N., & Shalley, C.E. 2008. Multiple tasks' and multiple goals' effect on creativity: Forced incubation or just a distraction? *Journal of Management*, 34(4): 786–805.
- Madjar, N., Shalley, C.E., & Herndon, B. 2019. Taking time to incubate: The moderating role of "what you do" and "when you do it" on creative performance. *Journal of Creative Behavior*, 53(3): 377–388.
- Mannucci, P.V., & Yong, K. 2017. The differential impact of knowledge depth and knowledge breadth on creativity over individual careers. *Academy of Management Journal*, 61(5): 1741–1763.

- Marinova, S.V., Cao, X., & Park, H. 2019. Constructive organizational values climate and organizational citizenship behaviors: A configurational view. *Journal of Management*, 45(5): 2045–2071.
- Miron-Spektor, E., & Beenen, G. 2015. Motivating creativity: The effects of sequential and simultaneous learning and performance achievement goals on product novelty and usefulness. *Organizational Behavior and Human Decision Processes*, 127: 53–65.
- Montag, T., Maertz, C.P., & Baer, M. 2012. A critical analysis of the workplace creativity criterion space. *Journal of Management*, 38(4): 1362–1386.
- Morris, M.W., & Leung, K. 2010. Creativity east and west: Perspectives and parallels. *Management and Organization Review*, 6(3): 313–327.
- Mueller, J., Melwani, S., Loewenstein, J., & Deal, J.J. 2018. Reframing the decision-makers' dilemma: Towards a social context model of creative idea recognition. *Academy of Management Journal*, 61(1): 94–110.
- Ng, T.W., & Feldman, D.C. 2012. A comparison of self-ratings and non-self-report measures of employee creativity. *Human Relations*, 65(8): 1021–1047.
- Niu, W., & Kaufman, J.C. 2013. Creativity of Chinese and American cultures: A synthetic analysis. *Journal of Creative Behavior*, 47(1): 77–87.
- Niu, W., & Sternberg, R. 2002. Contemporary studies on the concept of creativity: The East and the West. *Journal of Creative Behavior*, 36(4): 269–288.
- Oldham, G.R., & Cummings, A. 1996. Employee creativity: Personal and contextual factors at work. *Academy of Management Journal*, 39(3): 607–634.
- Parke, M.R., Seo, M.G., & Sherf, E.N. 2015. Regulating and facilitating: The role of emotional intelligence in maintaining and using positive affect for creativity. *Journal of Applied Psychology*, 100(3): 917–934.
- Perry-Smith, J.E. 2014. Social network ties beyond nonredundancy: An experimental investigation of the effect of knowledge content and tie strength on creativity. *Journal of Applied Psychology*, 99(5): 831–846.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., & Podsakoff, N.P. 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88(5): 879–903.
- Randel, A.E., Jaussi, K.S., & Wu, A. 2011. When does being creative lead to being rated as creative? The moderating role of perceived probability of successfully bringing ideas to a supervisor's attention. *Creativity Research Journal*, 23(1): 1–8.
- Rhodes, M. 1961. An analysis of creativity. *Phi Delta Kappan*, 42(7): 305–310.
- Rosen, C.C., Ferris, D.L., Brown, D.J., Chen, Y., & Yan, M. 2014. Perceptions of organizational politics: A need satisfaction paradigm. *Organization Science*, 25(4): 1026–1055.
- Runco, M., & Charles, R.E. 1993. Judgments of originality and appropriateness as predictors of creativity. *Personality and Individual Differences*, 15(5): 537–546.
- Scott, S.G., & Bruce, R.A. 1994. Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37(3): 580–607.
- Seibert, S.E., Kacmar, K.M., Kraimer, M.L., Downes, P.E., & Noble, D. 2017. The role of research strategies and professional networks in management scholars' productivity. *Journal of Management*, 43(4): 1103–1130.
- Shalley, C.E. 1991. Effects of productivity goals, creativity goals, and personal discretion on individual creativity. *Journal of Applied Psychology*, 76(2): 179–185.
- Shalley, C.E., Gilson, L.L., & Blum, T.C. 2009. Interactive effects of growth need strength, work context, and job complexity on self-reported creative performance. *Academy of Management Journal*, 52(3): 489–505.
- Shalley, C.E., Zhou, J., & Oldham, G.R. 2004. The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management*, 30(6): 933–958.

- Soda, G., Stea, D., & Pedersen, T. 2019. Network structure, collaborative context, and individual creativity. *Journal of Management*, 45(4): 1739–1765.
- Stein, M. I. 1953. Creativity and culture. *Journal of Psychology*, 36(2): 311–322.
- Stein, M.I. 1974. *Stimulating creativity (Volume 1): Individual procedures*. New York: Academic Press.
- Sullivan, D.M., & Ford, C.M. 2010. The alignment of measures and constructs in organizational research: The case of testing measurement models of creativity. *Journal of Business and Psychology*, 25(3): 505–521.
- Thornhill, S. 2006. Knowledge, innovation and firm performance in high- and low-technology regimes. *Journal of Business Venturing*, 21(5): 687–703.
- Tierney, P., & Farmer, S.M. 2002. Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45(6): 1137–1148.
- Tierney, P., Farmer, S.M., & Graen, G.B. 1999. An examination of leadership and employee creativity: The relevance of traits and relationships. *Personnel Psychology*, 52(3): 591–620.
- Vincent, L.C., & Kouchaki, M. 2015. Creative, rare, entitled, and dishonest: How commonality of creativity in one's group decreases an individual's entitlement and dishonesty. *Academy of Management Journal*, 59(4): 1451–1473.
- Vernon P.E. 1989. The nature–nurture problem in creativity. In J.A. Glover, R.R. Ronning, and C.R. Reynolds (eds), *Handbook of creativity*: 93–110. Boston, MA: Springer.
- Woodman, R.W., Sawyer, J.E., & Griffin, R.W. 1993. Toward a theory of organizational creativity. *Academy of Management Review*, 18(2): 293–321.
- Yuan, F., & Woodman, R.W. 2010. Innovative behavior in the workplace: The role of performance and image outcome expectations. *Academy of Management Journal*, 53(2): 323–342.
- Zhang, H., Kwan, H.K., Zhang, X., & Wu, L.Z. 2014. High core self-evaluators maintain creativity: A motivational model of abusive supervision. *Journal of Management*, 40(4): 1151–1174.
- Zhang, X., & Bartol, K.M. 2010. Linking empowering leadership and employee creativity: The influence of psychological empowerment, intrinsic motivation, and creative process engagement. *Academy of Management Journal*, 53(1): 107–128.
- Zhang, X., & Zhou, J. 2014. Empowering leadership, uncertainty avoidance, trust, and employee creativity: Interaction effects and a mediating mechanism. *Organizational Behavior and Human Decision Processes*, 124(2): 150–164.
- Zhou, J., & George, J.M. 2001. When job dissatisfaction leads to creativity: Encouraging the expression of voice. *Academy of Management Journal*, 44(4): 682–696.
- Zhou, J., Wang, X.M., Bavato, D., Tasselli, S., & Wu, J. 2019. Understanding the receiving side of creativity. *Journal of Management*, 45(6): 2570–2595. <https://doi.org/10.1177/0149206319827088>.
- Zhou, J., Wang, X.M., Song, L.J., & Wu, J. 2017. Is it new? Personal and contextual influences on perceptions of novelty and creativity. *Journal of Applied Psychology*, 102(2): 180–202.