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The Two Dimensions of Motivation and a Reciprocal Model of the Creative Process

Marie J. C. Forgeard and Anne C. Mecklenburg

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Marie J. C. Forgeard and Anne C. Mecklenburg
University of Pennsylvania

Past research investigating the role of motivation in creativity has closely examined the role of intrinsic (i.e., process-focused) and extrinsic (i.e., outcome-focused) motivation. Results from this literature have shown that the effects of social factors on creativity (e.g., social inhibition or facilitation effects) are at least partially explained by their effect on intrinsic and extrinsic motivation. The present review seeks to broaden the scientific understanding of the role of motivation in creativity by proposing that a second dimension of motivation needs to be taken into account. In addition to creators' locus of motivation (i.e., whether they focus on the intrinsic process and/or extrinsic outcomes), creative behavior also appears to be driven by its intended beneficiaries (i.e., the self and/or others). Supporting the importance of this second dimension, recent empirical research has begun to investigate the relationship between prosocial motivation (i.e., the desire to contribute to other people's lives) and creativity. Thus, a combined look at research on these two dimensions of motivation highlights the bidirectional nature of the social processes at play in creativity: While studies investigating creators' locus of motivation have examined the influence of others on creators, recent studies considering creators' intended beneficiaries have stressed the importance of also understanding how creators wish to affect others in return. To integrate these two perspectives, we propose a reciprocal model of the creative process in which creators' general motivational orientations (falling along the dimensions outlined above) are translated into specific motivational goals, and we review possible psychological mechanisms explaining how motivation may guide creative cognition.

Keywords: creativity, intrinsic motivation, extrinsic motivation, prosocial motivation

What drives humans to create new and valuable ideas or products? Past research examining the psychological factors that drive creativity has already yielded an extensive body of literature showing that the main motivator of creative behavior is the creator's intrinsic interest and enjoyment of the behavior itself.[1] Indeed, studies in this area have highlighted that intrinsic motivation enhances creativity, and extrinsic motivation can harm creativity insofar as it decreases intrinsic motivation (for a review, see Amabile, 1996). Whereas intrinsic motivation is defined as the degree to which creators engage in their work for the sake of the *process* itself, extrinsic motivation corresponds to the degree to which creators engage in their work for the sake of *outcomes external to the process*. Recent studies examining the nature of

motivational processes driving creativity have however highlighted the importance of a second dimension of motivation. Indeed, research on the role of prosocial motivation suggests that creative work may also be driven by its effect on the creator and on other people. Thus, in addition to considering creators' locus of motivation (i.e., whether they focus on the intrinsic process and/or extrinsic outcomes), researchers may also need to consider the intended beneficiaries of creative behavior (i.e., the self and/or others).

After reviewing past research in these two areas, we propose a two-dimensional framework of motivation in order to integrate them, with the goal of promoting a better understanding of the nature and variety of the types of motivations at play in creative thinking. Our review of the literature leading to the formulation of this framework highlights an important imbalance. Past research has for the most part examined how others influence creators, while little empirical psychological research speaks to the ways in which creators seek to influence others in return. Thus, this review highlights the need to view creativity as a dynamic and reciprocal process. This position is captured by a theoretical model that we introduce in order to guide future research in this area. This model posits that motivation plays an important role in explaining the influence of others on creators, and how creators in turn affect others. In addition, the model proposes that certain forms of

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[1] The term "creator" is used throughout this review to increase clarity of expression and simply refers to an individual who engages in creative behavior. To avoid confusion, we are not using the phrase "creative individual," which may imply that such an individual necessarily possesses certain creativity-relevant personality traits.

motivation may exert a specific and favorable effect on creative thinking (rather than a nonspecific tendency to act) by prompting creators to translate their general motivational orientations into particular motivational goals, and by influencing cognitive mechanisms beneficial to creativity. In keeping with our model, we discuss possible specific motivational goals at play in creativity by examining the rich accounts available in psychology and other disciplines, thus outlining future avenues for empirical psychological research in this area. We propose four possible prosocial motivations for engaging in creative work (among others to be identified and investigated by future research): (a) wanting to provide others with pleasurable or satisfying experiences, (b) wanting to foster communication, empathy, and connection, (c) uncovering new knowledge and problem-solving, and (d) wanting to challenge others and make them think in more complex or nuanced ways. To address how these motivations may translate into enhanced creative thinking, we discuss three possible mechanisms examined by past research, including increased persistence and vigor, psychological distancing, and perspective-taking. Thus, the model proposed in this article articulates how motivational, social, and cognitive processes interact during the creative process.

In addition to these goals, we will address how the model proposed may vary according to the level of creativity considered, by distinguishing between "mini-c" creativity (often subjective in nature, manifested through cognition and/or behavior), "little-c" creativity (observable by the self or others, sometimes defined as everyday creativity), "Pro-c" creativity (professional levels of expertise and accomplishment), and finally, "Big-C" creativity (eminent creativity that changes the course of history; Kaufman & Beghetto, 2009). Throughout this review, readers should keep in mind that empirical studies on the role of motivation and social processes in creativity have mostly focused on little-c and Pro-c creators, although seminal historiometric investigations (see below) have allowed researchers to also consider these questions in the context of Big-C creativity.

Motivation and Creativity

Research on the role of motivation in creativity first emerged as a result of increased interest in the "social psychology of creativity" (i.e., the study of the effects of social forces on the creative process, creative behavior, and creative achievement). From a theoretical standpoint, Rhodes (1961) first brought up the need to investigate the role of the creative press (i.e., environmental and social factors) in creativity. Amabile's (1983) *componential model* then proposed that others play a crucial role in the creative process through their influence on the creator's intrinsic motivation (as defined above). Also highlighting the role of others in creativity, Csikszentmihalyi's (1999) *systems theory* posited that creativity occurs when the change introduced by a creator in a particular domain is socially sanctioned by a group of experts. Finally, Glăveanu's (2012) *five A's framework* emphasized the dynamic nature of the social interactions at play in the creative process. From an empirical standpoint, the social psychology of creativity truly became a field of its own following Simonton's landmark historiometric investigations of the role of social and environmental factors in Big-C creativity, including the availability of role models and mentors (Simonton, 1975), interactions with other

creators (Simonton, 1984, 1992), or the political context (Simonton, 1975, 1976, 2004).

Locus of Motivation: Intrinsic and Extrinsic Motivation

Of these contributions, Amabile's (1996) componential model in particular yielded a body of empirical research specifically investigating *how* the presence of others influences creative behavior. According to Amabile's (1983) *intrinsic motivation hypothesis of creativity,* social situations that enhance intrinsic motivation increase creativity, whereas social situations that enhance extrinsic motivation decrease it (insofar as this extrinsic motivation detracts from intrinsic motivation). It is important to reiterate here that the terms "intrinsic" and "extrinsic" refer to qualities that are not intrinsic or extrinsic to the creator, but *to the creative process itself.* "Intrinsic" should therefore not be confused with "internal to the creator" nor "extrinsic" confused with "external to the creator" (or necessarily having to do with others). The difference between intrinsic and extrinsic motivation resides in creators' locus of motivation: when intrinsically motivated, a creator focuses on the creative process and its inherent rewards; when extrinsically motivated, a creator's motivation is redirected toward outcomes not connected with the process. In keeping with this, intrinsic motivation is associated with the pursuit of *learning goals* (i.e., gaining knowledge, skills, experience with the work at hand), whereas extrinsic motivation often entails the pursuit of *performance goals* (i.e., attaining objectives that are independent of the amount of learning that has occurred; Kaufman, 2009; Nicholls, 1979). Thus, situations that provide creators with the opportunity to learn foster creativity, whereas situations that emphasize performance over learning are detrimental.

The effect of others on creativity therefore also depends on who the "others" are, and what they do. Other people vary in the specific relationship they hold with the creator (e.g., audience member, peer, mentor, etc.), the resulting difference in the nature of the interaction considered (e.g., observation, evaluation, competition, support, etc.), and the motivations these interactions engender. Thus, Amabile revised the intrinsic motivation hypothesis to reflect that, in some cases, extrinsic motivators may also benefit creativity (Amabile, 1993, 1996; Amabile & Gryskiewicz, 1987). Overall, extrinsic social influences that reinforce creators' attention to the creative process, enhance learning by providing useful information, or validate their sense of self-competence (such as mentorship, or rewards designed to foster learning) probably tend to be beneficial and to supplement intrinsic motivation rather than damage it. In contrast, extrinsic influences that redirect attentional resources away from the process, constrain creators' freedom, or damage their sense of self-competence (such as critical evaluations, competition, or rewards that are not connected to the creative process) tend to be detrimental to creativity (e.g., Amabile, Goldfarb, & Brackfield, 1990; Byron & Khazanchi, 2012).

Beneficiaries

In light of the fact that creativity is usually defined as the generation of novel and useful ideas or products (Sternberg & Lubart, 1999), it is surprising that researchers have only fairly recently begun to empirically examine the importance of intended

beneficiaries to the creative process.[2] This research may have been delayed by the fact that creativity has anecdotally often been portrayed as a solitary and self-centered endeavor where the sole intended beneficiary is the creator her or himself. Speaking of his best-selling novel *The Kite Runner*, Khaled Hosseini (2007) explained, "I've always written for an audience of one. For me, writing has always been the selfish, self-serving act of telling myself a story" (p. 408). In spite of this, decades of psychological research suggest that the idea of the "lone genius" is largely a myth. As described above, research on the social psychology of creativity has highlighted the crucial role of others in the creative process (e.g., Plucker, Beghetto, & Dow, 2004; Sawyer, 2007). In addition to influencing this process, others are also on the receiving end of creativity. Indeed, creative products are generally meant to be experienced both by the creator and by others, and creators therefore may hold important motivational goals for what they want their products to achieve.

Because one of the main goals of this review is to specifically examine the role of others in motivational processes driving creativity, we refer the reader to other sources to learn more about the self-oriented benefits of creativity (e.g., Csikszentmihalyi, 1996; Drake, Coleman, & Winner, 2011; Forgeard, Mecklenburg, Lacasse, & Jayawickreme, in press; Pennebaker & Seagal, 1999).

We now turn to the empirical literature attesting to the importance of other-oriented motivation in creativity. This literature has mainly examined the role of prosocial motivation, defined as the "desire to expend effort based on a concern for helping or contributing to other people" (Batson, 1987; Grant & Berry, 2011, p. 10). After reviewing these findings, we briefly summarize contradictory evidence examining the role of antisocial motives in creative behavior.

Prosocial motivation. At least three bodies of literature have begun to investigate the role of prosocial motives in creativity: research on the values underlying creativity, research on the function of creativity within the framework of Terror Management Theory (TMT), and other social-psychological research.

Values. Research on values suggests that creativity may often be inspired by a desire to benefit others. Eastern conceptions of creativity appear to be rooted in social and moral values, as they explicitly attribute to creative people an intention to contribute to others and to society as a whole (Niu & Sternberg, 2002, 2006). In contrast, Western conceptions of creativity have tended to emphasize cognitive and personality aspects of creativity (Kaufman, 2009). Empirical investigations of the values of creators conducted in the West however suggest that creativity is indeed associated with prosocial values. For example, Dollinger, Burke, and Gump (2007) found that creativity (measured using both products and past accomplishments) correlated positively with Schwartz's (1992) value of universalism, which is similar to benevolence, but unlike the latter, involves doing good for unfamiliar people. This finding therefore suggests that creators may construe their activities as an attempt to enhance the lives of all.

TMT. Findings from the TMT literature (Solomon, Greenberg, & Pyszczynski, 1991) have also provided some initial evidence suggesting that creativity may under some circumstances be driven by prosocial concerns. Creative behavior poses an interesting dilemma in the face of the awareness of one's mortality: on the one hand, creative work affords a form of immortality or death transcendence by contributing something lasting to a culture (Lif-

ton, 1983); on the other hand, creativity may result in social isolation and disapproval (Arndt, Greenberg, Solomon, Pyszczynski, & Schimel, 1999). Accordingly, mortality salience appears to impede creative endeavors that threaten social connection, but enhance creative endeavors that bolster such connection (Routledge, Arndt, Vess, & Sheldon, 2008). More research is needed to explain exactly how mortality salience translates into creative cognitive processes.

Social–psychological research. Recent empirical studies have more directly examined the relationship between prosocial motivational processes and creative performance. In a recent correlational study, Carmeli, McKay, and Kaufman (2012) found that emotional intelligence and generosity in the workplace predicted self-reported creativity, and that this effect was mediated by vigor. In addition, in a series of four studies, Polman and Emich (2011) found that creating for the benefit of someone else led to more originality than creating for oneself. While results of this study are limited by the domain-specific nature of the measures used (e.g., creativity was assessed in one study by counting the number of unusual features of a drawing), these findings nevertheless were among the first to suggest that creating for the benefit of others may lead to enhanced creative performance. Another recent series of three studies by Grant and Berry (2011) directly tested the effect of prosocial motivation on creative thinking using both correlational and experimental methods, different samples of participants (employees and college students), and varied tools to measure creativity (supervisor ratings as well as a measure of idea generation and problem-solving). These methods are a first step in testing the potential causal nature of the relationship between prosocial motivation and creativity, as well as in addressing the important issue of social desirability. Indeed, it is possible that creators may feel compelled to overemphasize their generous motives when given the opportunity to self-report. The diverse methods used in the above set of studies represent the strongest demonstration of the link between prosocial motivation and creativity. Finally, Bechtold, De Dreu, Nijstad, and Choi (2010) found results similar to Grant and Berry's (2011) in the context of groups brainstorming solutions for specific problems, and demonstrated that high prosocial motivation was associated with increased quantity and originality of ideas, but only when epistemic motivation (the motivation to expend effort to reach an accurate understanding of the world—a construct closely related to intrinsic motivation) was also high.

Antisocial motivation. In contrast with the findings described above, past research suggests that creativity is associated with a number of antisocial personality traits including disagreeableness (King, Walker, & Broyles, 1996), dominance and hostility (Feist, 1998), and arrogance (Silvia, Kaufman, Reiter-Palmon, & Wigert, 2011). In addition, creative thinking abilities have been associated with unethical behavior in a number of studies conducted with samples of college students (Beaussart, Andrews, & Kaufman, in press; Gino & Ariely, 2012; Walczyk, Runco, Tripp, & Smith, 2008).

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[2] We here define "idea" and "product" very broadly, to encompass both concrete items as well as less tangible steps of the creative process during which new novel and useful insights emerge.

These results, while interesting, have no bearing on the question of creators' motivations for their own work. Indeed, examples abound of creators who, alongside positive creative contributions, behaved in nonprosocial ways in their everyday lives, by for example sacrificing personal relationships (Gardner, 1993). In addition, personality research suggests that moral behavior, while presenting trait-like consistency, also shows important within-person variability (Meindl, Jayawickreme, Furr, & Fleeson, 2013). Thus, while the aforementioned research provides interesting examinations of the personality profiles and behavioral tendencies of creators, we cannot infer from these that creators' work would also reflect these tendencies.

Nevertheless, and in line with these findings, researchers have started to wonder whether acts that involve the generation and implementation of novel, effective, but nefarious ideas should be considered creative (e.g., Kaufman, 2009). As a result, researchers have argued that creative acts motivated by the deliberate intention to hurt others constitute "malevolent creativity" (Cropley, Kaufman, & Cropley, 2008). Do these acts suggest that creativity may equally be fostered by antisocial motivation? This question cannot be answered at this point, as studies have yet to experimentally and rigorously investigate whether the motivation to hurt others enhances creative thinking processes. In addition, researchers describing malevolent creativity may adhere to a slightly different definition of creativity than the one typically used by researchers. In the case of malevolent creativity, the criterion of usefulness (Sternberg & Lubart, 1999) appears to be interpreted to mean "effective" rather than "valuable" (indeed, malevolent creativity destroys, rather than creates, value). Thus, while more research is needed at this point to investigate a possible link between malevolent intentions and creative thinking, it appears that successful malevolent acts may constitute a separate but related phenomenon to what has been traditionally referred to as "creativity" (and is now consequently sometimes termed "benevolent creativity"; Cropley et al., 2008).

The rest this review will therefore focus on exploring the ways in which prosocial motivation affects creative behavior, while acknowledging that more theoretical and empirical work needs to be done in order to understand the yet unstudied effects of antisocial intentions on creative thinking processes. The reader may now wonder, however, whether the notion that prosocial motivation enhances creativity adds a substantial contribution to the literature-Given the definition of creativity used by most researchers (which emphasizes usefulness), it may seem evident to argue that creators motivated to do good for other people produce better creative contributions. Several reasons prompt us to think that calling attention to this premise is in fact necessary and may lead to fruitful outcomes. First, in spite of the apparent predictability of this premise, little research has been conducted to date on the importance, specific nature, and role of prosocial motivation in creativity. Second, while prosocial motivation appears to have beneficial consequences for various kinds of task performance (Grant, 2007), research suggests that prosocial motivation may have particular and specific effects on key cognitive processes at play in creativity (as discussed below). Thus, understanding whether and how prosocial motivation translates into increased creative behavior may yield important insights into new methods for enhancing creativity.

A Two-Dimensional Framework of Motivation in Creativity

In light of the areas of research described above, we believe that the role of motivation in creativity can only be understood by adopting a two-dimensional framework that separately considers creators' locus of motivation and the intended beneficiaries of their work, while taking into account interactions between these two dimensions. Table 1 outlines four possible combinations of motivations, summarizing their nature as well as their possible manifestations in creators' work. To succinctly explain the nature of these motivational orientations, we describe them as *Growth*, *Gain*, *Guidance*, and *Giving*. First, motivations that are both intrinsic and self-oriented (*Growth*) focus on the personal benefits afforded by the creative process itself—for example, the creator's experience of flow, or the sense of meaning derived from the creative activity. Second, motivations that are extrinsic and self-oriented (*Gain*) focus on the external rewards constituting outcomes of the creative work—for example, the financial gains or recognition enjoyed by the creator as a result of the completion of his or her work. Third, motivations that are intrinsic and other-oriented (*Guidance*) focus on benefits for others afforded by the creative process itself—for example, meeting the expectations of mentors, or teaching others during the creative process. Finally, motivations that are extrinsic and other-oriented (*Giving*) focus on benefits for other people constituting external outcomes to the process—for example, helping others acquire knowledge, solving problems affecting them, or making them feel emotionally validated, among other possible goals (see below).

Motivations for engaging in creative work may most frequently lie on the Growth-Giving diagonal.[3] Other-oriented motivations may however not always involve the attainment of outcomes extrinsic to the creative process, and an extrinsic locus of motivation may in some cases (as described briefly above) prompt self-oriented goals. Keeping the two dimensions (locus of motivation and intended beneficiaries) independent allows us to look at these kinds of motivations. Although each dimension is presented as dichotomous in Table 1, the reader should keep in mind that the poles presented are not exclusive. Creators can be (and probably often are) simultaneously driven by both intrinsic and extrinsic motivators, or self- and other-oriented motivations. In keeping with this, recent research examining the motivations of "moral exemplars" has found that prosocial behavior often appears to be motivated by a synergistic combination of altruistic and egoistic motives (Frimer, Walker, Dunlop, Lee, & Riches, 2011). Having reviewed and integrated past findings on the nature and role of motivation in creativity, we now present a model of the creative process incorporating this research in order to describe the bidirectional nature of the interactions between creators and others.

A Reciprocal Model

The reciprocal model introduced here was designed to provide a more complete account of the social interactions at play in the

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[3] This has led other authors (e.g., Grant, 2008) to define prosocial motivation as extrinsic in nature. This decision only makes sense if prosocial motivation refers exclusively to the pursuit of outcomes external to the process, and does not include other-oriented goals inherent to the creative process itself (which are included in our framework).

Table 1
Two-Dimensional Framework of Motivation

	Beneficiaries	
Locus of motivation	Self-oriented	Other-oriented
Intrinsic: Process-focused motivators emphasizing learning goals	Intrinsic-Self (Growth), e.g., personal feelings of interest, flow, positive emotion, meaning, competence, etc.	Intrinsic-Others (Guidance), e.g., teaching and modeling for others, fulfilling mentors' expectations, etc.
Extrinsic: Outcome-focused motivators emphasizing performance goals	Extrinsic-Self (Gain), e.g., obtaining rewards, recognition, praise, etc.	Extrinsic-Others (Giving), e.g., contributing to or helping others, etc.

creative process, their relationship to motivation, and their effect on creative thinking processes (Figure 1). This model extends previous research by going beyond the examination of the influence that others have on creators to also describe how creators in turn affect others. Although we present a general model designed to capture the creative process, we do not imply that all creative acts follow this pattern. The frequency and importance of the interactions and processes described may instead fall on a continuum, and their importance may depend on important contextual factors such as the domain or the level of creativity considered. The model also takes into account the idea that creative acts likely do not result from one coherent set of motivations—multiple, contradictory sets of motivations (prosocial or not) may coexist in creators' minds.

These caveats notwithstanding, this model posits that others exert important influences on creators and have an impact on their general motivational orientations (that can be described along the two dimensions discussed above). In turn, creators may translate these general motivational orientations into more specific motivational goals. These subsequently may guide how creators implement their work during the creative process by stimulating important cognitive and behavioral mechanisms. The products created may then have an effect on others (either as intended, or different than what was intended), and this effect may alter the nature of the feedback and influences exerted by others on creators in the future (alternatively, it is possible that products may under some circumstances not have an effect on others, or creators may receive no feedback for their work). Thus, the model represents a dynamic
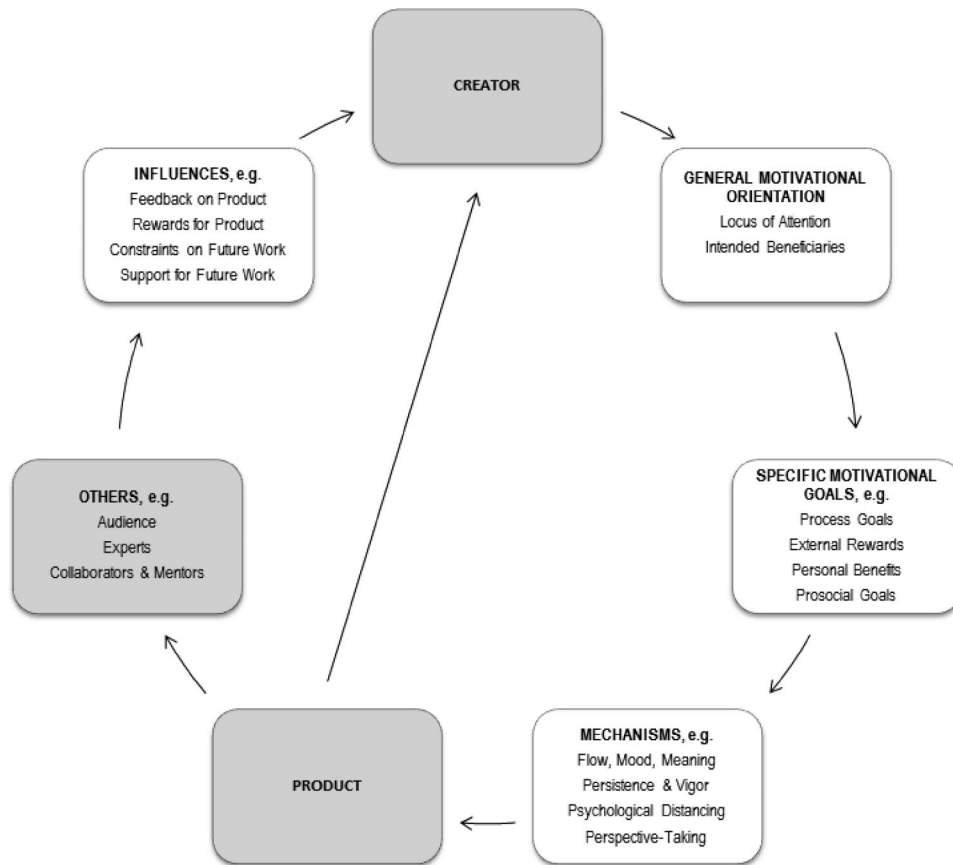

Figure 1. Reciprocal model outlining role of motivation in creativity.

and cyclical process in which the influence of others on creators and the creators' effect on others are in constant flux, and are continually redefined by the input of the other actors in the model. Creativity is not a static moment, but rather an ongoing, often lifelong, process of discovery, reflection, and revision. Furthermore, we do not wish to imply that because our arrows point one way, creative activity always follows the specific path outlined (as creators may go back and forth between steps in an iterative, trial-and-error fashion). The dynamic nature of this process may also explain developmental changes in creators' motivations. For example, an author who initially writes for personal pleasure may speak with fans and learn that her work helps them through difficult experiences. In subsequent work, this information may translate into new or strengthened prosocial motivation for writing, which may then prompt the author to experience greater self-oriented benefits as well.

How may the level of creativity considered affect the nature of the processes described in this model? We can only speculate here, given that past research has not specifically examined such variations. It is possible, for example, that higher levels of creativity place a greater emphasis on other-oriented benefits, as Pro-c or Big-C creativity necessarily involve sending the work out to an audience and receiving social recognition. The scope of the intended beneficiaries may also vary according to the level of creativity considered. A Pro-c or Big-C creator may be more concerned with impacting their field in beneficial ways, whereas a little-c creator may be more concerned with impacting an immediate audience or peer group. In contrast to an all-or-nothing approach, we hypothesize that all levels of creativity may involve some degree of self- and other-oriented motivations falling on a continuum (at the extreme end of which are creators who deny working for their or others' benefit), and which also depend on the individual and the work at hand. Indeed, both self- and other-oriented benefits appear relevant to all levels of creativity. Still, empirical research is needed to verify such speculations based on theory, as well as to investigate whether particular motivations apply more to some levels of creativity versus others. For the purpose of this review, we will not articulate further differences between levels of creativity, although we recognize that future research needs to take this important variable into account. Having reviewed the literature pertaining to the first elements of the model (how others influence creators' general motivational orientations), we now turn to examining the next components of the model: how creators translate their general motivational orientations into specific motivational goals, and how motivation then guides psychological mechanisms at play during the creative process.

What Are the Specific Prosocial Motivational Goals Driving Creativity?

The reciprocal model described above, based in part on the promising body of research examining the relationship between prosocial motivation and creativity, suggests that creators' work may be at least partially motivated by a desire to positively contribute to the lives of others. But how might they intend to do so? To the best of our knowledge, little empirical psychological research has been conducted to explore this important question. This is however a very important issue to address in order to understand why people engage in creative work, and ultimately,

how creativity can be fostered. We would like to address a common misunderstanding before we begin to discuss these goals, to prevent any confusion for readers: we have noticed that many often misinterpret the construct of prosocial motivation and equate it with a desire to please others. Specific prosocial goals however often go beyond (and sometimes against) pleasing audience members, in order to achieve other outcomes of benefit to others. As explained below, prosocial motivation may be pursued by deliberately challenging others and eliciting discomfort or negative emotions, if this leads to some form of beneficial outcome.

We now turn to laying out an agenda for future research on this question. We offer additional hypotheses for future research based on perspectives from psychology and other disciplines. We believe that considering work done in other fields can help broaden our understanding of the creative process and stimulate our own scientific creativity. In keeping with our approach to hypothesis generation, Lindauer (1998) called for a more interdisciplinary approach to psychology, in which the research conducted and perspectives offered by the humanities are more closely considered. Indeed, given the prevalence of scholarship on the creative process in other disciplines, valuable perspectives may be gained by considering how philosophers (especially in the fields of aesthetics, epistemology, and the philosophy of science), literary critics, and art historians have thought about these motivations. The value of this multidisciplinary survey lies in highlighting new opportunities for future study, and the value of such knowledge for the field of psychology will remain limited until it is incorporated into rigorous empirical research. This literature review did not aim to produce an exhaustive list of all of the possible prosocial motivations underlying creativity (an endeavor beyond the scope of this paper). Rather, it intended to inform the generation of hypotheses guiding future empirical psychological research. From this review, we highlight here four main motivations: (a) wanting to provide others with pleasurable or satisfying experiences (hedonic motivations), (b) wanting to foster communication, empathy, and connection, (c) uncovering new knowledge and problem-solving, and (d) wanting to challenge others and make them think in more complex or nuanced ways. We selected these four motivations because we judged them to: (a) be central to the creative process, (b) appear to capture yet unstudied or understudied aspects of the creative process, and (c) yield promising and testable hypotheses for future empirical research. We look forward to future research that will expand this list and investigate these constructs empirically.

Providing Hedonic Experiences

Perhaps the most widely discussed motivator of creativity is the search for hedonic experiences (including positive emotional experiences such as pleasure, enjoyment, interest, satisfaction, etc.). Psychologists interested in empirical aesthetics have for example suggested that, through art, creators intend to elicit a pleasurable "aesthetic emotion" that audience members seek to experience (Winner, 1982, p. 52). Starting with Fechner (1876), researchers have investigated which formal psychophysical properties (e.g., color, brightness, loudness) elicit pleasure or interest from the audience. Berlyne (1971), drawing on psychobiological traditions, then proposed arousal as the main mechanism explaining why humans are drawn to art. According to Berlyne, art produces

pleasure either by causing a moderate elevation in arousal (an "arousal boost"), or by causing a sharp rise in arousal followed by a relieving decrease (an "arousal jag"). Creators can provoke arousal jags by using complex stimuli (to cause a sharp rise in arousal) that viewers are drawn to decode and understand in order to return to their baseline arousal level.

In parallel, philosophers have pointed out that the experience of pleasure also seems to play a part in scientific creativity, and many creative scientists have described experiencing immense pleasure from the beauty that they perceive in their products (Martin, 2007). French mathematician Poincaré (1952) for instance commented that "the scientist does not study nature because it is useful to do so. He studies it because he takes pleasure in it, and he takes pleasure in it because it is beautiful" (p. 22). Beauty in science seems to depend at least partially on some of the same principles as beauty in art, such as proportion or regularity (Chandrasekar, 1979). In addition to provoking pleasure in themselves, it is possible that scientists also desire to evoke pleasure in other like-minded scientists or laypeople, although no research to date has investigated this hypothesis. Still, anecdotal accounts suggest that Einstein's law of relativity was chosen and accepted by the field of physics precisely because it was more beautiful than other theories (McAllister, 1996).

Communication, Empathy, and Connection

Creators may also be motivated by a desire to use creative products as a means to communicate with others, and in particular in the case of art, to communicate ideas that cannot be translated into words (Winner, 1982). In particular, the philosopher Langer (1953) suggested that "art is the creation of forms symbolic of feeling" (p. 40), which normal language cannot properly describe. One may argue that the feelings embodied by a product may be made mostly for the benefit of the creator, but Langer added that one of the "differences between art and reveries" is that "a work of art has a public—least a hypothetical public" (p. 392), which she identifies as the "ideal audience" to whom the creator wishes to convey the feeling.

How might others benefit from coming into contact with depictions or expressions of complex emotional states? First, this experience may allow others to better understand their own experience. As Bruner (1962) explained, creative products provoke a "shock of recognition, a recognition of the fittingness of an object or a poem to fill the gaps in our own experience" (p. 72). Thus, members of the audience benefit from being exposed to depictions of their complex internal worlds. For example, it is possible that one reason behind the universal appeal of Leonardo da Vinci's *Mona Lisa* is that she expresses mixed emotions (Callaway, 2009), a complex state that is often hard to apprehend and recall for individuals (Aaker, Drolet, & Griffin, 2008; Williams & Aaker, 2002). By contemplating the *Mona Lisa's* complex internal emotional world, we may learn to better understand our own. Second, others may benefit from being exposed to depictions or expressions of complex emotional states by allowing them to develop their ability to engage in perspective-taking, experience empathy, and feel connected to others. In keeping with this, Tolstoy (1965) described the function of art as the "infection" of feeling that "destroys, in the consciousness of the receiver, the separation between himself and the artist" (p. 414).

The empathy and connection-enhancing properties of artistic products may also have important moral significance (Bermudez & Gardner, 2003), by "developing our imaginative capacity to be sensitive to the needs, emotions, and moral qualities of other people" (p. 3). Nussbaum (1995) developed that argument by proposing that the novel, in particular, helps us enter the subjectivity of the individuals whose situations are described, and "promotes mercy through its invitation to empathetic understanding" (p. 130). Creative products may therefore help us develop our moral understanding by conveying nuanced and complex depictions of human experience.

Knowledge and Problem-Solving

Creators may also be motivated by a desire to produce valuable knowledge, and may consider the acquisition and dissemination of knowledge as an end in itself, or as a means to solve other problems. The philosopher Kitcher (2001) defined two ways in which the significance of scientific findings is judged: according to their *epistemic* and *practical* contributions. According to Kitcher, humans' concern for solving problems cannot account for all scientific creativity, since many fields of research have little if any consequences for everyday issues (e.g., cosmology, paleontology). Scientists therefore also appear to be moved by the sole desire to understand the world, to "discover the fundamental causal processes at work in nature" (p. 66), and to disseminate that knowledge to others. In addition to being valuable in itself, knowledge may also be created in order to solve otherwise unsolvable problems. The contribution of science to human progress is so important that, according to Martin (2007), scientific and technological creativity constitute moral creativity, as "it contributes new and morally valuable products that serve basic human needs for food, energy, and medicine [. . .] and it protects nonhuman animals and the environment" (p. 1).

The motivation to produce knowledge both for its own sake, and for the sake of inventing new solutions to existing problems, can in some circumstances appear somewhat similar to the aforementioned goal of promoting communication and empathy. In both cases, creators communicate something that the audience either does not know or does not fully understand. There are however important differences between these two motivations, which lead us to present them separately. Creators motivated to enhance communication and empathy in others focus on transmitting knowledge about other people's thoughts, feelings, and subjective experiences, with the ultimate goal of facilitating an emotional connection between others. In contrast, creators motivated to discover, disseminate, and use knowledge toward problem-solving, think of these goals as ends in themselves, as opposed to means to enhancing others' emotional well-being and sense of connection.

Complexity and Challenge

Finally, recent work in empirical aesthetics suggests that viewers may benefit from being exposed to complex and challenging works. These works, which may provoke discomfort and elicit negative emotional experiences, benefit individuals by pushing them to think in more sophisticated and nuanced ways about important topics. Shifting away from the arousal-based models of art appreciation described above (e.g., Berlyne, 1971), researchers

have turned to appraisal theories of emotion to explain how audiences respond to art. Appraisal theories assert that emotions develop through subjective appraisals of a stimulus, rather than through its objective properties (Roseman & Smith, 2001; Turner & Silvia, 2006).

One significant contribution of these appraisal-based accounts is that they have encouraged researchers to examine responses to art beyond pleasure and surprise. In particular, Silvia (2012) noted that artists often hope to inspire a range of emotions in their audience, including negative or ambivalent emotions such as confusion, melancholy, or anger. In light of these motivations, Silvia argued that basing aesthetic theories only on the emotion of pleasure does a disservice both to artists' intentions and to the reality of what audience members experience. Research on emotions such as confusion (Silvia, 2010), anger and disgust (Silvia & Brown, 2007), and fear (Eskine, Kacinik, & Prinz, 2012) has supported the conclusion that viewers experience both positive and negative emotions, with different appraisal structures, in response to art.

As explained above, in spite of the potentially challenging or difficult emotional experiences they elicit, such works are driven by prosocial motivation insofar as creators intend audience members to benefit from this experience. For example, viewers of Picasso's *Guernica* may not experience positive emotions while looking at the painting, yet the work's message about war, destruction, and suffering is widely regarded as a valuable and beneficial one for audiences to be exposed to (van Hensbergen, 2004). One interesting hypothesis (which, to the best of our knowledge, has not yet been empirically examined) may also reconcile the apparent contradiction between the motivation to provide audience members with hedonic experiences, and the motivation to challenge and unsettle them. The consumption of certain creative products may constitute a form of "benign masochism" (Rozin, 2000, p. 980). Just as humans report enjoying eating chili pepper in spite of the burning sensation it provokes, they may also find some form of satisfaction in exposing themselves to challenging experiences with creative products. According to Rozin, pleasure is derived from the simultaneous experience of physical sensations of danger, and the cognitive realization that the danger is not real. Such experiences may provide audience members with important opportunities for personal growth, without the costs that true life challenges would entail. Having outlined possible targets for future research on the specific motivations driving creative behavior, we now turn to the last component of our reciprocal model which helps account for how motivation is translated into creative behavior.

Mechanisms Explaining the Effects of Prosocial Motivation on Creative Thinking

Several candidate mechanisms could explain how prosocial motivation benefits creative thinking. Little research has looked at this important question, and we have noticed that it is not uncommon for many to confuse the nature of the motivations explaining *why* individuals engage in creative behavior with the nature of the processes describing *how* they do so. Thus, it is not clear that individuals motivated by other-oriented benefits necessarily consider others (and in particular, their intended beneficiaries) during the creative process, and future empirical research is therefore

needed to address this issue. For example, a creative scientist may pick research questions based on what will most benefit others, but he or she may not be thinking specifically of that motivation when he or she is engaged in moment-to-moment tinkering with a research design. Keeping in mind the need to investigate these questions further, we review here recent evidence investigating how prosocial motivation affects creative thinking processes.

Persistence and Vigor

Prosocial motivation may exert its effect on creative thinking by increasing persistence and vigor for the task at hand. For example, Grant (2008) showed that high levels of prosocial motivation increased persistence and productivity when intrinsic motivation was also high. Related to the role of prosocial motivation in driving persistence and productivity is Carmeli et al.'s (2012) finding that the relationship between generosity and creativity is explained by increased vigor, defined as a set of related affective states involving physical strength, emotional energy, and cognitive liveliness (Shirom, 2011).

Psychological Distance

Gertrude Stein (2008) famously wrote, "I write for myself and strangers" (p. 99). While many creative achievements have certainly come about as a result of a creator's close relationships, preliminary evidence on psychological distancing suggest that Stein's motivation to write for distant others may be beneficial to creativity. Indeed, *construal level theory* (Trope & Liberman, 2003) proposed that perceived psychological distance influences the mental representations of events, and events perceived as distant (either temporally or spatially) are more likely to be represented using abstract and general features. Thus, psychological distance appears to enhance creative thinking by promoting a global and abstract cognitive processing style (Förster, Epstude, & Özelsel, 2009; Förster, Friedman, & Liberman, 2004; Jia, Hirt, & Karpen, 2009; Liberman, Polack, Hameiri, & Blumenfeld, 2012). In keeping with this, the aforementioned series of studies by Polman and Emich (2011) found that their results were mediated by psychological distance (operationalized as social distance), explaining why decisions for distant others (in this study, ideas for gifts) tended to be more creative than decisions for close others and for the self.

Perspective-Taking

According to the findings by Grant and Berry (2011) reviewed above, prosocial motivation may also exert its effect on creativity by promoting perspective-taking (see also Hoever, van Knippenberg, van Ginkel, & Barkema, 2012). Parker, Atkins and Axtell (2008) described perspective-taking as occurring "when an observer tries to understand, in a nonjudgmental way, the thoughts, motives, and/or feelings of a target, as well as why they think and/or feel the way they do" (p. 151). By developing the ability to assess what other may currently think and experience, and to anticipate how others may react and what will have a beneficial effect on them, creators may be able to come up with particularly useful creative ideas. The hypothesis that perspective-taking can lead to more creative products is consistent with findings in

industrial and organizational psychology showing that individuals are more likely to come up with ideas that are useful to others when they engage in perspective-taking (Mohrman, Gibson, & Mohrman, 2001). Perspective-taking may help with the process of evaluating and selecting the best ideas among those generated (Silvia, 2008), and by providing a standard for deciding which ideas are useful (Grant & Berry, 2011).

The two mechanisms proposed above may at first glance appear to contradict each other. Indeed, psychological distance involves removing oneself from the "here and now" in order to think abstractly and conceptually. In contrast, perspective-taking is rooted in the ability to grasp the subjective, concrete, and immediate experience of others. How could these two seemingly opposite processes both increase creativity? One intriguing solution to this riddle is the possibility that creativity (especially in the arts) often involves being able to express universal and abstract truths through concrete means, thus making both abstract and concrete thinking important building blocks of the creative process (Mar & Oatley, 2008). In addition, these processes may be advantageous at different stages of the creative process.

Summary and Conclusions

The present review provided an in-depth exploration of the role of motivation in creativity. To do this, we first described the dimensions of motivation at play in creativity. While past research has tended to focus on the locus of motivation of creators (i.e., whether creators focus on the process or the outcomes of creation), more recent studies point out the need to also take into account the intended beneficiaries of the work (i.e., the effect that their work will have on themselves and on others). In light of these two dimensions, we proposed a reciprocal model of the creative process, which highlighted the need to study how creators intend to affect others, in addition to how others affect them. The model reviewed possible ways in which others may influence creators' general motivational orientations. These may in turn be translated into more specific motivational goals corresponding to the ways in which they wish to affect themselves or others. Finally, we proposed several possible mechanisms accounting for the effect of prosocial motivation on creative thinking including persistence, vigor, psychological distancing, and perspective-taking. These mechanisms, through the creative process, influence the ultimate creative idea or product generated. This product may then affect others (either as intended, or in different ways), and others in turn may influence the creator back in a dynamic fashion. Thus, others and creators constantly redefine their influence on each other based on the inputs they exchange.

Following a multidisciplinary literature review of the motivations behind creativity in the arts and sciences, we proposed that at least four other-oriented motivations are worthy of future empirical investigation by psychological researchers: evoking pleasure, communicating and fostering empathy and connection, producing knowledge for its own sake or to solve otherwise unsolvable problems, as well as challenging others and getting them to think in increasingly complex ways. Future empirical research will hopefully complement this nonexhaustive list. Again, these informed speculations cannot substitute themselves for carefully conducted empirical research, but we hope that this glimpse into the theoretical knowledge produced by thinkers in psychology and other fields will stimulate interest in these issues, and in turn, new empirical research to explore them.

Future research should also assess whether certain specific motivations are more important for some fields than others. For example, our review would lead us to hypothesize that the motivation to create or discover beauty to provide others with pleasurable experiences, and the motivation to make them think in more complex ways, may be shared by both artists and scientists. In contrast, the motivations to communicate what language cannot express, as well as to foster a sense of connection and empathy, appear most relevant for the arts, whereas the motivation to disseminate epistemic and/or practical knowledge appears most relevant for the sciences. Subtle distinctions may also explain how particular motivations may be experienced by individuals from various fields. For example, with regards to knowledge, the philosopher Carroll (2000) described the difference between art and science as the difference between knowledge *that* something is true (science) and knowledge *of* what something is like (art). Future research should also take into account relevant individual differences that may affect the relationship between motivation and creative achievement. In addition, as explained above, the level of creativity considered needs to be taken into account when considering the role of reciprocal social processes at play in creativity. The importance of prosocial motivation may for example increase hand-in-hand with the level of creativity considered.

While this review discussed recent studies demonstrating an association between prosocial motivation and creativity, additional research is needed to replicate, expand upon, and clarify this relationship. In addition, while many previous researchers have developed measures of prosocial and altruistic behavior (e.g., Carlo & Randall, 2002; Chadwick, Bromgard, Bromgard, & Trafimow, 2006; Rushton, Chrisjohn, & Fekken, 1981), personality (e.g., Penner, Fritzsche, Craiger, & Freifeld, 1995), and moral reasoning (e.g., Carlo, Eisenberg, & Knight, 1992), we do not know of any measures that specifically examine prosocial orientations and behaviors in the context of creativity (but see Grant, 2008 for a short measure of prosocial motivation that can be adapted to fit creative activities). Developing such measures will constitute an important first step in investigating the relationship between prosocial motivation and creativity.

Although this review emphasized the role of prosocial motivation in creativity, we feel the need to repeat here a cautionary note included above. Past research has produced convincing evidence that prosocial motivation plays a role in *some* creative endeavors, but it has not established (and likely will not be able to establish) that a prosocial motive *always* lies behind creativity. As with other phenomena of interest to psychologists, creativity is a multiply determined and complex construct. Encouraging researchers to study which motivations enhance creativity (and how they do so) is nevertheless an important initiative insofar as results from this line of research may be used to build new interventions, following up on Simonton's (2005) remark that "practical new methods are needed for enhancing both personal and societal creativity" (p. 197). Most of the empirical literature on interventions aimed at increasing creative thinking has focused on cognitive approaches (Forgeard & Eichner, in press; Scott, Leritz, & Mumford, 2004). In addition, the few existing interventions using motivational approaches have focused on preventing the potentially negative effects of extrinsic motivators (e.g., Hennessey & Zbikowski,

1993). We hope that the reciprocal model presented here will stimulate further research on the specific motivations underlying creativity, and, in turn, will promote the development of new and effective intervention approaches and tools to enhance creativity.

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