JOURNAL OF
Creative Behavior
Publication of the Creative Education Foundation™

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The Creativity Matrix: Spotlights and Blind Spots in Our Understanding of the Phenomenon

ABSTRACT

In this paper, we organize past and present theories and models of creativity by using a new conceptual framework—the creativity matrix—with the aim of highlighting the dimensions of creativity we know a lot about and those we tend to either ignore or find difficult to study. This matrix is formed by bringing together a developmental model of creativity (the 4 C's) and a structural one (the 5 A's). We start by briefly describing these two conceptual frameworks, and then, we proceed to exploring the matrix itself by describing how the 5 A's are dynamically organized at each "level" of the 4 C's. Importantly, our overview of the matrix is informed by existing models and concepts that address one of more of the C's and the A's. This gives us a unique opportunity to take stock of what has been studied so far and, toward the end, consider new avenues for the development of theory and research agendas within creativity studies.

Keywords: creativity, 4 C's model, 5 A's model, theory, creativity matrix.

Creativity has traditionally been defined as consisting of novel and task-appropriate behavior (Guilford, 1950). Yet if we turn that lens inward, is creativity research progressing in a creative manner, neither stagnant nor chaotic?

Many studies and theories suggest how easy it is for an individual or a field to get stuck in inertia. Ideas that are too striking original are less likely to be accepted or even evaluated correctly (Blair & Mumford, 2007; Licuanan, Dailey & Mumford, 2007). People have a built-in appreciation for the established. We prefer things that already exist (Eidelman, Crandall & Pattershall, 2009), are well-established (Eidelman, Pattershall & Crandall, 2010), and represent the status quo (Eidelman & Crandall, 2012). If one pushes the field ahead too much, one takes the risk of being rejected or ignored; conversely, smaller contributions are more often appreciated, at least initially, than larger ones (Sternberg, Kaufman & Pretz, 2001, 2002, 2003).

Such tendencies are not inherently a bad thing. It is easy to point to creativity's reliance on decades-old theories and measures. To give but one example, the continued use of divergent thinking tests is a perpetual debate (Baer, 2011a,2011b; Kim, 2011a,2011b), with passionate defenders on both sides. Critics point to divergent thinking tests' domain-general approach, artificiality, and results that indicate creative potential, not creative achievement (Baer, 2015).

Yet just as novelty is only part of creativity's definition, we must also be alert of not going too far afield as disciplines as diffuse as psychology, education, engineering, business, and neuroscience continue to advance the study of creativity (e.g., Kaufman & Sternberg, 2019). To return to the measurement example, if every new study devised its own measure, then drawing larger conclusions becomes impossible. How can such conflicts be resolved? Just as individuals must find the sweet spot that is new but not random and task-appropriate but not repetitious, so must we as a field take a deeper look. We must try to identify the field's own creative strengths and weaknesses and use our creative metacognition (Kaufman & Beghetto, 2013a,2013b). Is creativity being creative in how we approach creativity (Runco, 2015)?

Any answer to this question needs to start from acknowledging the fact that creativity as a scientific research topic presents any scholar with the challenge of complexity (Montuori, 2003). It is inherently difficult to bring under the same umbrella forms of expression that range from brief moments of insight to children's episodes of pretend play to new products at the workplace or striking advances that revolutionize society. It is not only the level of creativity that makes the difference here, but also the fact that each one of the instances above involves a specific dynamic. Children at play engage with each other and the material world differently than managers trying to develop innovation in a corporation. Yet even across these two

contexts of creativity, there is space for similarities. For example, the playing children and the corporate manager both potentially use *as-if* and *what-if* thinking (Craft, 2002; Kark, 2011). Beyond particular psychological processes, however, there are even deeper communalities in terms of the elements required by creative expression across levels and tasks. For instance, there will always be at least one person acting creatively, a product (whether material or conceptual) derived via a particular process. Further, in nearly all cases there are other people who serve as collaborators, advisors, or intended consumers as well as a set of resources (symbolic and physical) used to create. The specific details vary for each situation, but the core elements remain the same.

The two core dimensions that determine the type of creativity scenario are as follows: (a) where on the trajectory a creation falls and (b) the interactive, systemic elements required for creation to occur. The two aspects have been captured in the creativity literature by the Four C's and the Five A's models, respectively (Glăveanu, 2013; Kaufman & Beghetto, 2009). These frameworks focus on two different yet inter-related dimensions of creativity: The "vertical" axis points to a trajectory going from mini-c to little-c to Pro-c to Big-C (without implying that there are sharp boundaries between levels and recognizing the value of each one), and the "horizontal" axis draws our attention to the interplay between actors, audiences, actions, artifacts, and affordances within each creative act (without considering them isolated but, rather, as interdependent). What emerges from plotting these two dimensions together is a matrix that considers different levels of creative expression *and* their elements in a dynamic as well as systemic manner. As such, this matrix is not simply a 4×5 table in which each resulting category (e.g., the creative actor at a mini-c level) needs to be considered separately and studied on its own, as in Mendeleev's periodic table in chemistry.

On the contrary, we propose a creativity matrix (CM) that plays the role of a map and, therefore, should not be confused with the actual territory it represents. As with any map, it has its limitations (it cannot cover or depict everything) and it does not preclude the possibility of entirely different maps existing that represent alternate or additional theories and typologies. There are many different possible approaches that could have been used. Other models, for example, delve into creative domains, stages of the creative process, the distinction between individual versus group creativity, or the nature of the creative contribution.

We have chosen to merge together the Four C's and the Five A's for a few specific reasons. One is to understand creativity as the complex phenomenon it is; the expanse of the Five A's can include nearly any facet of creativity research. Similarly, the Four C's often implicitly include concepts such as domains (education will largely fall under mini-c and little-c, whereas business will be Pro-c) or types of creative contributions. The Five A's offer a structural view of creativity with a special concern for its dynamic (thus components and inter-relations between them), whereas the Four C's go beyond level of the phenomenon and shed light on its development (thus issues related to magnitude and temporality). Another is that the scope of both models allows broader reflections on which areas of the matrix are amply represented in creativity scholarship and which have been largely neglected. In this sense, the CM should not be used primarily to organize or catalog what we know, but rather to develop a more holistic understanding of what it means to create and consider areas that might be fodder for future research.

In this paper, we start by briefly describing the two conceptual frameworks that make up the creativity matrix. Then, we proceed to exploring the matrix by describing how the Five A's are dynamically organized at each level of the Four C's. We could have just as easily reflected on each one of the A's along the various C's, but chose the current approach for practical (there are less elements in the Four C's model) and conceptual reasons (the Five A's are highly inter-dependent). Importantly, our overview of the matrix is informed by existing models and concepts that address one of more of the C's and the A's. This integration gives us a unique opportunity to take stock of what has been studied so far and then consider new avenues for the development of theory and research agendas within creativity studies.

TWO C'S, FOUR C'S, FOUR P'S, AND FIVE A'S

Two core ideas within creativity are Big-C and little-c and the Four P's. Big-C and little-c is a dichotomous view of everyday and eminent creativity. Big-C is creative genius, such as Verdi or Vonnegut or Voltaire (Simonton, 2009). Little-c is creativity that all of us can do, from cooking a good meal to making a shiny birdhouse to making up a funny joke (Silvia, Beaty, Nusbaum, Eddington, Levin-Aspenson, & Kwapil, 2014). Although the concepts have been present for decades, Csikszentmihalyi (1988) was the first to document these ideas (Simonton, 2013).

If Big-C and little-c describe levels of eminence, then the Four P's (Rhodes, 1962) categorize ways of conceptualizing creativity itself. The Four P's are the person, product, process, and press; indeed, this

structure has launched several thousand student papers. Scholars interested in the creative person might take an individual differences approach and examine personality, motivation, mental health, or intelligence (Kaufman, 2016). Those focused on the creative process might study creative problem-solving or look at what happens in the brain when someone is creative. Researchers who are drawn to the creative product are likely to be interested in assessment, whereas the creative press might lead to studies of creative environments (such as the classroom or the workplace).

Over the last decade, there have been two theories that attempt to build upon these past ideas (Beghetto & Kaufman, 2013). The Four C's model (Kaufman & Beghetto, 2009) expands on the traditional Big-C/little-c view of creativity (Beghetto & Kaufman, 2015; Csikszentmihalyi, 1998). First, the model introduces the category of mini-c (Beghetto & Kaufman, 2007, 2009), which is the creativity that can emerge from the learning process. A subjective experience, mini-c is personally meaningful but may not be recognized as creative by anyone else. For example, someone may be learning physics and make an original connection between concepts that is a new metaphor to her. However, other people may consider such an insight obvious or uninteresting. Similarly, an adult might try writing a poem or painting a picture for fun. His output might be judged as derivative, dull, or filled with mistakes that would be instantly noted by experts, but it is nonetheless his own expression of creativity. Mini-c then can grow to little-c, in which other people agree that someone's efforts are creative. The model then added another category, Pro-c, or expert-level creativity. Pro-c reflects expertise and high accomplishment; a well-published author, established scientist, or company CEO would all be Pro-c. Finally, Big-C comes with time and continued appreciation over generations; such a creator's contributions live on even after death.

What exactly do we study when we are concerned with Big-C, Pro-c, little-c, or mini-c? Rhodes (1962) suggests that we actually focus on person, process, product, and press. And, indeed, for a long time, these "elements" have been the focus of attention in creativity research, historically some (like the creative person) more than others (e.g., the press or environment). One of the issues with using this typology is that it allows researchers to segment creativity into parts and study them in isolation from each other. The second concern has to do with the fact that materiality, although hugely important in all areas of creative work, is not represented in the Four P's (since studies of press focus most often on the social environment). The Five A's framework of actors, audiences, actions, artifacts, and affordances (Glăveanu, 2013, 2015a) not only includes the material aspect—by pointing our attention to what is afforded to our action by the environment—but also brings together, conceptually, the different "elements" of creativity into an integrated and dynamic whole. Using this new vocabulary, we become sensitive to the fact that questions about creative people need to consider them beyond their cognitive or neurological makeup and recognize them as social actors. Actors of creativity are in dialogue with diverse audiences (e.g., collaborators, critics, gatekeepers, the general public) as they engage creative actions (idea generation and implementation, communication with others, preparation, etc.) that lead to the generation of new and meaningful artifacts (symbolic and/or material). Using the Five A's framework makes us consider the creativity system not only in terms of its elements (like the Four P's) but also, first and foremost, in terms of relations between these elements. What actor–audience relations are favorable for creativity? How can we use affordances creatively in our action? What kinds of artifacts do we use to produce new artifacts?

The questions above are theoretically and pragmatically useful, and, we argue in this paper, they become even more relevant when considered in a differentiated manner as proposed by the Four C's model. The outcome of this synthesis is an expanded Four C's/Five A's creativity matrix. We will pay special attention to the role of the affordances and the audience at each "c" level, given that these two components represent the biggest distinction from Rhodes' (1962) original Four P's.

EXPLORING THE CREATIVITY MATRIX

MINI-C AND THE FIVE A'S

Mini-c creativity is both easily overlooked and pervasive. Since most instances of mini-c creativity are "invisible" (i.e., there are few behavioral indicators associated with them), it might seem challenging to discuss them in terms specific to the Five A's. Indeed, most of the Five A's (e.g., action, affordances, artifacts, audiences) require some form of externalization. Yet mini-c can occur as a personal idea or thoughts.

The actor of creativity is perhaps the most obvious at this level. Ontogenetically, one would expect mini-c creativity to be typical for early stages of development, in which new meanings and understandings are commonly acquired. However, mini-c is by no means reserved for childhood. Each and every person has the potential to engage in mini-c creativity, from the very young to the elderly, from low to high creative

achievers. A Big-C creator also has moments of mini-c creativity, either in her area (some of which will be transformed further and brought to fruition, and others which may remain idle musings) or in other spheres of activity.

What is the resulting artifact in such cases? Mini-c creativity leads to ideas or perspectives that are personally meaningful, and as such, the artifact or product is most often symbolic in nature (and oftentimes infused with emotion). Examples may include original associations, taking a unique perspective, or constructing new meanings about a common situation. Such examples also point us to the kinds of actions that lead to them.

Action here is primarily symbolic (psychological) rather than material (physical), although there is no strict separation between the two since psychological processes are all ultimately embodied. Acts of association (Benedek, Könen & Neubauer, 2012), perspective-taking (Glăveanu, 2015b), creative learning (Beghetto, 2016), and meaning-making (Kaufman, 2018; Valsiner, 2007) are all important at a mini-c level. Thinking and imagining are, following Vygotsky (1987), forms of internalized action (e.g., imagination is internalized play).

At the mini-c level, affordances can be those of material objects, whenever materials are used, but can also be, by extension, ideas that make it easy for them to be combined or transformed in a certain manner. For example, thinking in metaphors typically involves relating a target and source domains, and in this regard, some ideas or domains are more amenable to being connected than others (in terms of the appropriateness of the resulting artifact).

Perhaps the most interesting question to raise in relation to mini-c creativity concerns the audience. By definition, mini-c leads to meaningful novelties that may not be recognized as creative by anyone else, partially because they might never even be articulated. Does this potential paradox mean we should only talk about the Four A's in the case of mini-c? No; instead, we argue that two separate types of audience need to be distinguished. There is the *explicit* one, represented by other people (e.g., collaborators, critics, or consumers), which is often the only one that may come to mind. Yet there is also an *implicit* audience, represented by the internalized knowledge, perspectives, expectations, and norms specific for a given social context. Although the former might not be present in most mini-c creativity, the latter is a foundational component, just as it is for learning and for imagination (Zittoun & Glăveanu, 2017). In addition, an unexpressed mini-c thought can still inform, amuse, or cause reflection internally. In other words, the creator may be the sole audience for an idea—and under these circumstances, an audience of one may be just as impacted as an audience of thousands.

LITTLE-C AND THE FIVE A'S

Little-c creativity marks a fundamental progression from mini-c. Most notably, there is appearance of a more tangible artifact that has been recognized as being creative in some way by other people. Little-c creativity brings with it the existence of some kind of materialization, which could be communicated through speech or play or through process-based, often tangible artifacts.

Little-c creators, such as mini-c creators, include anyone who experiments with producing novel and useful artifacts in a given domain of activity that are then shared with others who can at least recognize the potential for creativity in these artifacts. Little-c creators do possess and utilize a variety of personal resources (cognitive, emotional, and conative) as well as environmental resources; see, for example, Lubart's multivariate approach (Lubart & Guignard, 2004) or Amabile's componential model (Amabile, 1983; Amabile & Pratt, 2016). What is specific to little-c creativity is the actor's lack or limitation of expertise and competence in his or her chosen area or domain of creative expression. Given the opportunity—in particular, a supportive audience and the required affordances—nearly all of us can all be everyday creators. The basic, universal requirements for creativity are attainable for almost anyone (e.g., Baer & Kaufman's Amusement Park Theory, 2005, 2017).

In little-c creativity, different ideas or materials are combined or transformed in ways that depend on their affordances. In children's pretend play, for example, a small block of wood can be used as a car. However, not every piece of material is suitable for imagining a car. Consider objects such as a large dictionary or a bag of groceries, whose physical properties do not allow them to easily slide, as though propelled by imagined wheels.

This example illustrates one type of little-c creative action, pretend play (Russ & Wallace, 2013). Many other examples are possible. Creative cognition models, such as Geneplore (Finke, Ward & Smith, 1992), postulate the interplay between two psychological processes: the generation of "preinventive forms" (ideas)

and their evaluation. These processes underpin a wide range of creative acts, from mini-c to Big-C forms of creativity. But this dynamic is more embodied that it might seem at first. Possibility thinking, a term initially proposed by Anna Craft (2010, 2015), captures the materiality of little-c or everyday creativity, by pointing to its behavioral expression: questioning, risk-taking, enacting as-if and what-if thinking, etc. Flow, another well-known concept (see Csikszentmihalyi, 1997), emphasizes the immersion in action, focus, and intrinsic motivation that can characterize episodes of little-c creativity (although not restricted to this particular level).

Last but not least, in terms of audience, little-c artifacts can certainly be generated (and enjoyed) in solitude. Most often, though, they are produced with or communicated to others, typically peers who observe, collaborate, use, or evaluate the resulting artifact. Vygotsky (1967) defined the zone of proximal development as the space of possibility for learning and creativity when working with more capable peers. Little-c acts of creativity are particularly fostered by social interaction within such zones of proximal development in which creators and audiences—often exchanging positions—improvise together in playing or solving mundane problems. One way for little-c creators to continue to mature and develop their craft is to engage in such behavior with Pro-c mentors.

PRO-C AND THE FIVE A'S

Pro-c creativity designates professional, expert-level creative achievement. It is distinguished by the attributes of the creative actor—key among them knowledge and experience in a particular area—and of the creative artifact, which enjoys wider social recognition and adds to an existing field of creative production.

Creative actors in this case are no longer necessarily each and every possible person but rather those people who have undergone certain types of training or apprenticeship and are recognized for their creative ability. They are, as the Systems model (Csikszentmihalyi, 1988) articulates, legitimate contributors to an existing cultural domain (e.g., science, art, technology, business, education) as appreciated by gatekeepers who get to select which artifacts get to enter the domain and what do not. Pro-c creative actors use both domain-specific and domain-general skills to create and are often highly intrinsically motivated to do so (Amabile, 1996).

Although Pro-c implies that someone is an active contributor to a field during their lifetime, it is also possible that some may need a day job unrelated to their creative work simply for financial sustenance. Not all creative fields are remunerative. There are the cases of geniuses who are not recognized in their lifetimes (although this phenomenon is uncommon; Simonton, 1998); however, Kaufman (2016) argues that their contributions in such cases would be retrospectively Pro-c. In other words, according to this position, even a John Kennedy Toole or Emily Dickinson would have been Pro-c when alive, with Big-C awaiting as their work spread posthumously.

There are a wide variety of creative artifacts associated with Pro-c levels of creativity. The propulsion model refers in this regard to the three main types of creative contribution: those that accept current paradigms and attempt to extend them, those that reject current paradigms and attempt to replace them, and those that try to integrate and synthesize existing paradigms (Sternberg et al., 2001, 2003). In a similar vein, Gilson and Madjar (2011) distinguished between radical and incremental creativity, arguing that Pro-c creative outcomes either create a rupture with past work or emphasize continuity.

The creative actions that underpin these various outcomes and forms of expression at a Pro-c level are not fundamentally different from those mentioned under little-c, at least according to the creative cognition approach which postulates, for instance, the cyclical generation and evaluation of ideas (Finke et al., 1992; Weisberg, 1993; for a Big-C perspective, see Simonton, 1999). A specificity in the case of Pro-c, however, is that creators are more often confronted with problems they need to solve as part of their professional lives. The creative problem-solving model (see discussion in Sawyer, 2012) and its stages are especially relevant, ranging from the initial phases of problem finding (Reiter-Palmon & Robinson, 2009) to idea generation to idea evaluation to solution validation. This last stage is particularly important for Pro-c creative actors who interact on a continuous basis with various audiences, which can range from co-workers and peers to critics to the wider public (e.g., users). For any problem that involves other people, a solution cannot be considered successful unless it is viewed that way by its audience.

Under such circumstances, audiences actively participate in the creative process by appreciating, using, or transforming the products or ideas that Pro-c creators propose as creative artifacts. User innovation, co-creation in teams, and the emergence of the "produser" (Bruns, 2009) all illustrate these complex and dynamic relationships between actors and audiences at this level of creative production.

Finally, Pro-c creative actions generally utilize a much wider range of affordances given that professional creators tend to employ a variety of tools, including technologies, in order to create. The nature of these tools and the frequency with which they are used would depend, of course, on the domain of activity (see Glăveanu et al., 2013). The importance of domains (e.g., Baer & Kaufman, 2017; Kaufman & Baer, 2005) is much greater as we move from mini-c to little-c to Pro-c creativity (see Kaufman, Beghetto, Baer & Ivcevic, 2010). It is even more true in the case of Big-C.

BIG-C AND THE FIVE A'S

Big-C creativity is one of the most complex forms of creative expression. As a consequence, it involves multiple interactions between the Five A's, which often take place over an expanded period of time.

The actors are in these cases recognized or celebrated contributors to a cultural domain, at a national or international level. They often use a mix of what Gardner (2011) identified as different types of intelligence (visual–spatial, bodily kinesthetic, musical, linguistic, logical–mathematical, interpersonal, intrapersonal, and naturalistic) in a highly effective manner. They also tend to defy the spirit of the times, the crowd, and even themselves through their work (Sternberg, 2018). Defying conventions and their contemporaries puts Big-C creators in close (and occasionally contentious) contact with other people. These audiences are both those who shape and are shaped by the Big-C creator's remarkable productions.

Returning to Csikszentmihalyi's Systems model (1988), the gatekeepers of the domain play a crucial part in recognizing what is actually high achievement. They safeguard (and, occasionally, may make stagnant) the boundaries of a given domain. Creative actors are here in contact with specific or internalized others (see the distinction between implicit and explicit audience in the case of mini-c). In addition, they interact with the general public—or, to be more precise, their understanding of what the public might want, expect, or be surprised by (what George Herbert Mead, 1934, called the generalized other). Indeed, the way that an audience perceives a creative work may be seen as an aesthetic act itself (Tinio, 2013).

This distant or generic type of audience also leaves its mark on creative actions at a Big-C level. Although frameworks such as flow, Geneplore, and creative problem-solving still apply, Big-C artifacts may more often reflect the traditional stages identified by Wallas (1926): Preparation, incubation, illumination, and verification. The exact number and order of these stages has been revised several times (Sawyer, 2012) and yet the importance of time in the production of high level creativity is undeniable.

Last but not least, both Big-C and Pro-c creative actions not only use existing affordances, but oftentimes invent objects or tools with new affordances or use them in an unconventional manner (see Glăveanu, 2012). For example, the creation of machines that can reach outer space builds on existing affordances that make flying in the Earth's atmosphere possible, but it also adds substantially to them (hence the difference between a plane and a rocket). Signing one's name to a urinal, on the contrary, seems like an easy accomplishment; calling it art and getting others to accept it as such (in time), as Duchamp did, involves breaking conventions in ways that eventually get recognized as Big-C.

SPOTLIGHTS AND BLIND SPOTS IN CREATIVITY THEORY

The matrix we have proposed to explore the field of creativity research combines one focus on level (through the Four C's) with another on system (through the Five A's). By doing so, we aim to highlight those aspects of the phenomenon that are well represented in theory and research—as well as those areas that may merit further examination.

Since creativity research across most disciplines is expanding rapidly, one of the main challenges we face in proposing the use of this matrix has to do with the selection of theories to be included. In this regard, we cannot claim an exhaustive review of the literature but a selective one, where we focused on the best-known theories and models of this phenomenon as presented in introductory textbooks and key handbooks in the field. When starting this exercise, we soon came to notice that many theories are hard to place in a specific spot in the matrix. This difficulty arises not only because most theories of creativity are multifaceted in some way, but also because it is often different to disentangle levels and elements of creativity from each other. As previously argued in the case of the Five A's, the elements they refer to are defined in view of each other, and thus, this classification defies sharp and static boundaries (see Glăveanu, 2015a,b). Equally, mini-c, little-c, Pro-c, and Big-C creativity should be understood dynamically as they are embedded within each other and organized along a developmental path rather than existing independently. Each level has its own trajectory; the Four C's are not distinct, bucket-like units.

Instead of describing every theory or using a C-based or A-based matrix, we will briefly highlight, as follows, interactive clusters that are rich in theory and note areas that have spawned less discussion. Importantly, if an area is the subject of less research and theory that does not necessarily mean it is an area being intentionally overlooked. It's easy could be the case that the dimensions it captures are complex and difficult to study both in conceptual and in methodological terms (i.e., we are missing the proper tools).

SPOTLIGHTS

Within the *spotlight* of creativity research, we find that the triad of actor—action—artifact (corresponding to the three P's of person, product, and process) is quite well studied. Work is particularly ample at the transition points of the Four C's. The growth of mini-c to little-c is at the heart of a great deal of education scholarship (e.g., Beghetto, Kaufman & Baer, 2014), whereas little-c and some Pro-c work tends to focus on individual differences and how the actor's creativity relates to other constructs; these can include intelligence (i.e., Plucker, Karwowski & Kaufman, in press), motivation (i.e., Hennessey, 2019), and personality (i.e., Feist, Reiter-Palmon & Kaufman, 2017). As the C's grow higher, there is a shift of emphasis from the actor–action union toward the actor–artifact connection. Pro-c progressing into Big-C is the foundation of much work on genius (Simonton, 2009) and aesthetics (Tinio, 2013).

Further, interactions between the actor, artifact, and audience at the mini-c and little-c level are covered by socio-cultural theory (Vygotsky, 1967, 1987) and the reciprocal model of the creative process, which focuses on prosocial motivation (Forgeard & Mecklenburg, 2013). Moving higher, both Pro-c and Big-C (and to a certain extent, little-c) are examined by many theories, including the investment theory of creativity (Sternberg & Lubart, 1992), the propulsion model (Sternberg et al., 2002), the Systems model (Csikszentmihalyi, 1988), and the Amusement Park Theory (Baer & Kaufman, 2005, 2017). Another crossroads that is the subject of much thought is the blend of actions and affordances at the mini- and little-c level. These areas are explored by creative learning (Beghetto, 2016), possibility thinking (Craft, 2010), and creative metacognition (Kaufman & Beghetto, 2013a,2013b).

Some scholarship focuses primarily on one of the A's at various levels of expression. For example, the componential model (Amabile, 1996; Amabile & Pratt, 2016), the evolving systems approach (Gruber, 1988), multiple intelligences (Gardner, 2011), and malevolent creativity (Cropley, Kaufman & Cropley, 2008) are largely actor-focused. Many theories or core concepts emphasize the creative action across all C levels, such as the Geneplore model (Finke et al., 1992), divergent thinking (Runco & Acar, 2019), flow (Csikszentmihalyi, 1997), perspective-taking (Glăveanu, 2015b), combinatorial thinking (Simonton, 2010), associative thinking (Mednick, 1962), and much of the problem-solving literature, from Wallas (1926) to more recent conceptualizations (Mumford, Mobley, Uhlman, Reiter-Palmon, & Doares, 1991; Reiter-Palmon & Robinson, 2009).

BLIND SPOTS

The *blind spots* in research, as evidenced by the use of the creativity matrix proposed here, include mini-c creativity in relation to the Five A's and affordances across all C levels. This general absence can be explained by the fact that both mini-c and affordances are relatively new additions to the "classical" conceptions of the Two C's and Four P's. They also designate issues—subjective experience and materiality—that are less commonly studied in psychology as a whole. Yet a focus on precisely these elements could shed light on creative processes across the matrix. For instance, clarifying the dynamic of the Five A's in the case of mini-c creativity is bound to bring us closer to a comprehensive understanding of personal creativity (Boden, 2004; Runco, 1996) without reducing this form of creative expression to only the two categories of person and process. Equally, a study of affordances and their use in creative action will certainly illuminate how objects turn into resources and tools to create (see Glăveanu, 2016, for a proposed model).

There are many other areas in need of further theoretical elaboration. One is the interaction of artifact and audience in the case of little- and mini-c creativity (i.e., levels at which there is oftentimes no material expression, at least of a lasting or shared kind). Such studies would lead to a new interest in linguistic creativity and its relation to narratives and meaning-making as both an individual and social practice (Kaufman, 2018). Another area is the Five A's at a Pro-c level beyond the organizational literature. In general, little-c creativity and Big-C creativity in non-business domains receive much more attention that professional expression. It is interesting to note that Pro-c, too, is a new addition to the 2 C's. Such scholarship would help us recognize the importance of creativity in professional contexts in ways that sharpen our understanding of domains and their work cultures (Glăveanu & Lubart, 2018). Again, although industrial/

organizational psychology and business have covered these areas in great deal for traditional workers or leaders, Pro-c creativity in domains from the arts to science is generally understudied.

USING THE CREATIVITY MATRIX

All in all, the use of the creativity matrix proposed here makes us sensitive to recurring questions. For example, what are the psychological processes involved in creativity and the individual differences associated with them? How are notable creative artifacts produced and received by other people? These are essential concepts to investigate, but they are not exhaustive.

Indeed, the matrix allows us to focus on questions we rarely get to ask, such as what affordances are used in acts of creativity ranging from mini-c to Big-C levels? We can then ponder why we don't ask these questions: (a) There is more academic recognition (including increased possibilities to get published or earn grants) to be gained from adding to existing knowledge rather than initiating new areas of research; (b) we are still missing adequate conceptual and methodological tools to capture less visible but also more material actions and interactions; or (c) we became stuck into a kind of functional fixedness (Duncker, 1945) that blinds us to areas of research and questions that are, in fact, within our grasp. Most probably, a combination of these explanations (and others) is at play.

At the same time, there are new and exciting developments taking place in creativity research. Some are in the form of basic approaches, such as the rise of neuroscience (Abraham, 2018) and rebirth of socio-cultural perspectives (Glăveanu et al., 2019). Others are special topics of interest, such as creativity and social justice (Kaufman, 2017) or creativity as agentic action (Karwowski & Beghetto, 2018). What becomes important, when considering these advances through the lenses of the creativity matrix advanced here is to see how (and if) these new angles take into account more than one level or component of creativity and, if they do, how (and if) they manage, conceptually and methodologically, to deal with the matrix as a unitary and evolving system rather than a set of disparate elements.

To illustrate one way of using the CM as a way of taking stock of the field, we have selected some core disciplines that study creativity. We have created a table (see Table 1) that shows, in our view, the emphases placed by these disciplines across the matrix when researching creativity. We have already mentioned how education focuses on the triumvirate of actor–action–artifact across mini-c and little-c. We have attempted to place other disciplines, from Business to Engineering to Neuroscience to different branches of Psychology, across the CM. It is important to note that our placement is based on common, currently existing work, as opposed to the scholarship one may wish to conduct. For example, we have placed Neuroscience at the interaction of actor and action from mini-c to Pro-c. We are certain that neuroscientists would be absolutely thrilled to hook creative geniuses up to machines (and some have done it), but practicality makes such cases rare.

Another illustration of how the matrix may be used is to take any large topic in creativity and see how it is approached at different levels. For example, let us examine creativity assessment. Self-assessments (Kaufman, 2019), divergent thinking (Runco & Acar, 2019), and the Consensual Assessment Technique (CAT; Amabile, 1996; Kaufman & Baer, 2012) are the three most common ways of measuring creativity (Barbot, Hass & Reiter-Palmon, 2019; Forgeard & Kaufman, 2016). Self-assessments are primarily actor-focused, ranging from mini-c to Pro-c. Depending on the focus (i.e., reporting creative behaviors versus capturing creative style), action, artifact, and affordances may also be included. Divergent thinking tests are a mix of actor–action–artifact from mini-c to little-c. The CAT, we would argue, is spread across the matrix. It looks at the artifact across all C levels (Big-C level products can be rated by judges). The audience is from little-c to Pro-c (raters should have some level of expertise), and the actors are mini-c to Pro-c (anyone living can produce new work to be evaluated).

There are many other ways that creativity is measured. The use of convergent thinking tests is in decline (Snyder, Hammond, Grohman & Katz-Buonincontro, 2019), but the Remote Associates Test and other similar measures would, like divergent thinking, be a mix of actor–action–artifact from mini-c to little-c (perhaps up to Pro-c on rare occasion). Historiometric assessments would typically be actor–artifact (occasionally touching on audience and affordances) from Pro-c to Big-C (Simonton, 2009). Teacher or supervisor ratings would be mostly actor–artifact–audience at mini-c/little-c and little-c/Pro-c, respectively. Insight problems (i.e., Duncker, 1945) are actor–action–affordances at mini-c/little-c. Interviews or other qualitative assessments would certainly include the actor across mini-c to Pro-c, with the other A's being dependent on the nature of the interview.

TABLE 1. The Creativity Matrix with Discipline Emphasis

	Action	Actor	Artifact	Audience	Affordance
mini-c	Clinical Psych Cognitive Psych Cultural Psych Design Developmental Psych Education Neuroscience	Clinical Psych Cognitive Psych Cultural Psych Developmental Psych Education Neuroscience	Cognitive Psych Cultural Psych Design Education	Aesthetics Cultural Psych	Design
little-c	Clinical Psych Cognitive Psych Cultural Psych Design Developmental Psych Education Neuroscience	Clinical Psych Cognitive Psych Cultural Psych Developmental Psych Education Neuroscience Social Psych	Cognitive Psych Cultural Psych Design Education Engineering Social Psych	Aesthetics Cultural Psych Engineering Social Psych	Design Engineering
Pro-c	Cognitive Psych Neuroscience Design	Business Clinical Psych Neuroscience Social Psych	Aesthetics Business Engineering Social Psych	Aesthetics Business Engineering Social Psych	Business Engineering
Big-C	Cognitive Psych	Clinical Psych Cognitive Psych Business	Aesthetics Business Engineering	Aesthetics Business Engineering	Business Engineering

What do such exercises suggest? The creativity matrix can help us organize a number of important topics within creativity research that go beyond a simple organization of theories. We posit the CM can shed light on a variety of other issues such as disciplinary approaches and creativity assessment. Its aim, in each case, is not to categorize per se. Indeed, the exact label and placement of a theory, discipline, or form of assessment can be contested (and, we hope, lead to some interesting debates). Rather, we hope to show the wider or narrower distribution of the field of creativity's interests and tools, both conceptual and methodological. In Table 1, we used gradients of gray to show areas of the matrix that lie in the spotlight and those that are still in the shadows for most researchers. What would it mean to shed light on the latter or to expand our understanding of the former to them? Can we simply "stretch" existing concepts and adapt them for understudied areas of the matrix or do these require completely new, original theories and methods? These kinds of questions, we believe, are essential for the future of our field of research.

CONCLUSION

In this paper, we proposed a creativity matrix (CM) that brings together two existing conceptual frameworks in creativity research—the Four C's model and the Five A's model—both of them building on older foundations (the little-c and Big-C distinction, the Four P's of creativity). What emerges is much more than a 4 × 5 grid, we argue, but rather a complex theoretical landscape against which we can plot theories, concepts, and empirical findings about creativity accumulated over the years or even decades. This exercise is not one of the simply ticking boxes, however, but of reflecting on which areas of the matrix accumulate a lot of research and attract attention, and which areas are marginal, forgotten, or remain undiscovered. We are certainly not claiming that the Four C's/Five A's framework proposed here comes close to covering everything there is to know about creativity. The CM itself can be extended and modified. But the two dimensions it brings together—a developmental focus and a systemic one—will remain fundamental for the dynamic of creativity across people, domains, cultures, and time. We used the metaphors of spotlights and blind spots to highlight what currently stands out when using the matrix versus what could eventually stand out with new conceptual and methodological advancements. Should these metaphors help our community shed new light on neglected areas, then the CM framework would have achieved its main goal.

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